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GROWTH, DEVELOPMENT
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Joseph J. Stern

[Harvard University. Center for international affairs]

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September, 1967.

Growth, Development and Regional Equity
in Pakistan

I. Introduction

The existence and stubborn persistence of regional dualism at various stages of national development is a facet of economic growth long recognized. Indeed, Hirschman notes that for an economy "to lift itself to higher income levels, [it] must and will first develop within itself one or several regional centers of economic strength."^{1/} It is obvious that economic progress does not appear everywhere at the same time. There are within a country " ... particular places ... where wealth can grow most easily ... marked out by geographical advantages, proximity to minerals or sources of power, or to areas particularly suitable for specialized crops; alternatively they may have naturally good communications, so that though their sources of supply are at a distance, they can be supplied from many sources rather easily."^{2/} Although it may be relatively simple to posit a variety of causes leading to spatial inequality, it is more difficult to explain their persistence.

I have greatly benefited from comments and suggestions made by Professor Hollis B. Chenery and Dr. Walter P. Falcon. Unfortunately the responsibility for any remaining errors and for the conclusions must remain with the author.

^{1/} Albert O. Hirschman, The Strategy of Economic Development. (New Haven: Yale University Press, 1958). p. 184.

^{2/} J. R. Hicks, Essays in World Economics. (Oxford: Clarendon Press, 1959), p. 163.

Presumably the economic interdependence among regional units within a nation can be expected to be much stronger than between countries. Admitting for a moment the applicability of the classical assumptions, internal factor mobility should tend to eliminate inter-regional income differences. Abstracting from transport costs, regional differences can persist only via lags in the dynamic adjustment process. The fact that depressed areas and backward regions continue to persist suggests that some internal factor flows tending to reduce interregional inequality do not occur with sufficient speed and quantity to offset the dynamic conditions which cause an increase in inequality. Thus once unequal rates of growth develop, they tend to perpetuate themselves. Industry and trade will become attracted to the dynamic region in part, at least, to take advantage of the external economies which such a growing center possesses.^{3/} Investors thus spend a long time mopping up all the opportunities around some "growth pole" and neglect those that may have arisen or could be made to arise elsewhere.

While the problem of regional income inequality is not limited to underdeveloped countries, it is the context of development that the regional problem can have severe repercussions. If the economic differences between regions also follow a clear geographic division and reinforce some social and linguistic differences, then the growing disparity in regional welfare may cause a severe strain on the political framework of the nation. In a number of developing countries the allocation of resources is controlled by some central government agency. Consequently, discontent with the spatial distribution of growth is readily focussed on such an allocative agency.

^{3/} While there undoubtedly are real external economies which mark the growing region, it is also likely, as Hirschman notes, that the aura of success in the dynamic center may lead to an overestimation of such external economies by potential investors. Cf. Hirschman, op. cit., p. 185.

The government's program to ameliorate the problem of regional disparity will often entail, as a minimum, an effort to change the past pattern of resource allocation and ensure an increase in the share of total investment destined for the lagging region. A more active government policy may encompass a policy of income transfer to the poorer region as well. Such regional programs may take the more dramatic form of TVA's or may be implemented through highly publicized institutions like the Casa per il Mezzogiorno, or it may simply result in a general national commitment to regional welfare and the use of various differential taxes and incentives to create regional transfers.^{4/}

Regardless of how the government's regional policy is implemented, the need to take account of the regional problem adds an additional difficulty to the already complex problem of achieving rapid economic growth for the nation as a whole. While "so long as such an effort [to give preference to backward depressed areas] does not diminish appreciably the rate of progress of the economy

^{4/} Among the better known post-war regional development programs are those for Southern Italy and the Northeast of Brazil. For an analysis of the Italian situation see Hollis B. Chenery, Paul G. Clark and V. Cao Pinna, The Structure and Growth of the Italian Economy, (Rome: Mutual Security Agency of the United States of America, 1953) and Hollis B. Chenery, "Development Policies for Southern Italy," Quarterly Journal of Economics, LXXXVI (November, 1962), pp. 515-547. The Brazilian case is discussed in Werner Baer, Industrialization and Economic Development in Brazil, (Homewood, Illinois: Richard D. Irwin, Inc., for the Yale University Economic Growth Center, 1965) and Stefan H. Robock, Brazil's Developing Northeast: A Study of Regional Planning and Foreign Aid, (Washington, D. C.: The Brookings Institution, 1963). Additional references to regional planning and programs can be found in the extensive bibliography in John R. Meyer, "Regional Economics: A Survey," Surveys of Economic Theory, Vol. II (New York: St. Martin's Press, 1965).

and thus its capacity to provide cumulative increases in investment, the sentiment is unexceptionable,"^{5/} it is precisely the implied shift in investment resources from one region of a country to another that may well lead to a lower national income level and growth rate for the economy as a whole. The equity considerations which might force the government to undertake public action to redress the regional imbalances may make more difficult the problem of raising savings and increasing the national growth rate.^{6/}

While regional targets are often considered a relatively minor objective in the overall national plans, the precise weight that should be given to regional factors can really only be judged within the political and geographic framework of the specific country being studied. For geographically small and politically and socially homogeneous countries, the problem of a disparity in regional income may never become very serious. At the other extreme, for geographically large countries, marked by a diversity of political, linguistic, and cultural factors, the question of inter-regional income differences may become an increasingly important factor as economic development proceeds. While the real world allows for no such facile dichotomies, it is clear that in Pakistan the political tensions generated by the problem of "economic dualism" have reached such a stage that an analysis of long term growth of the economy is incomplete and even irrelevant if considerations of regional welfare are omitted.

^{5/} Thomas Balogh, "Equity and Efficiency: The Problem of Optimal Investment in a Framework of Underdevelopment." Oxford Economic Papers, (New Series), I, no. 14, (February 1962), pp. 25-35.

^{6/} A possible, but certainly less interesting case, where the dynamic region has grown not because of any inherent economic advantage but solely through government favoritism is ruled out. In such a situation the proper allocation of investment would not only remove the regional problem but maximize national growth as well.

Two serious obstacles usually restrict the scope of regional analysis. The first relates to the simple problem of defining the boundaries of the area to be chosen for analysis. Ideally, the region to be studied should be the geographic area for which clear policies and objectives have been enunciated. The second problem is the lack of data relating to such an "economic development region."^{7/} In practice the area to be studied is usually restricted by the availability of relevant economic series. The oft noted fact that Pakistan is divided into two non-contiguous provinces, East and West Pakistan, presents us with clearly defined regions which are easily identifiable with what might be called the "lagging" and "dynamic" region and for which specific development policies and objectives exist.^{8/} At the same time data relating to the economic performance of the two provinces are available. While the conceptual problems of defining regional income still exist, such data does provide a basis from which to begin the analysis. It should, however, be added that the regional data are at the very least marked by the same shortcomings as all the statistical information available in Pakistan and to some extent are perhaps even weaker.

^{7/} The term "economic development region" was first used by Fischer. See Joseph L. Fischer, "Concepts in Regional Economic Development Programs," Papers and Proceedings of the Regional Science Association, Vol. I (1955) pp. w1-w20.

^{8/} It should not be inferred from this that there is economic homogeneity within the provinces. Indeed, some of the intra-provincial differences in economic welfare may well be much greater than the measured inter-regional differences. Nevertheless, as a generalization, and especially one which has become of political importance, the identification of East Pakistan as the lagging region and West Pakistan as the dynamic region has considerable validity.

The remainder of the paper is divided as follows. First the background to the regional problem is presented. Then attention is focussed on the long-term growth of the economy in a macro-economic setting. Using the results of the macro-analysis, an attempt is made to spell out the structural changes implied by alternative growth paths. Finally the policy alternatives open to the planners are discussed.

The attempt to analyze both the macro and micro aspects of the development process reflects a desire to lose neither the information which might be gained by focussing on the dynamic aspect nor that to be gained from the sectoral. The more usual specification of planning models is to concentrate either on the problem of planning over time, or at the other extreme, to emphasize the sectoral analysis in a static setting. This dichotomy in the emphasis found in various planning models flows rather directly from the computational difficulties inherent in solving multi-sectoral and inter-temporal models. If, in addition, a regional dimension is included, the problem becomes even more acute.

Neither the dynamic nor the sectoral aspect of the development process can be sacrificed without considerable loss of information. Yet the sectoral breakdown of the economy should not be aggregated to such a degree that any technological differences in the production structure among the various sectors, and among the regions, becomes meaningless and that choice, in terms of sectoral composition, becomes highly restricted. Similarly, in terms of disaggregation over time, one would like to leave scope for a gradual transition from one phase of the development process to the next rather than force the model to make abrupt changes as would occur if the dynamic aspects of the problem were severely restricted.

The question as to what aspect of the problem can be omitted with a minimal loss of information is a complicated one, while it is clear that there is a considerable need for simplification.

One method of simplifying the solution of the problem of planning over regions, time, and sectors is to break it down into steps or stages which can be tackled in succession.^{9/} More specifically, it seems appropriate to deal first with the problem of distributing production and income over time without regard to the composition, while as a second stage, the question of composition and structure can be analyzed. This means that first a macro problem is set in which the intricacies of distribution over time are given full attention and that as a second stage a micro problem is solved.

The advantages of approaching the problem of multi-sectoral, multi-regional, and inter-temporal analysis through a process of stages are relatively obvious. Such an approach allows for considerable scope in analyzing both the dynamic and sectoral aspects of regional growth. Nevertheless, this method does have some limitations which are discussed in section IV.

II. Growth and Structural Change in the Regional Economies

Economic growth in Pakistan can be divided into two distinct periods. The first, from 1950 to 1960, or perhaps more correctly 1959, was one of relative stagnation.^{10/} Since 1960 the economy has shown a remarkable improvement in its development performance.

^{9/} Jan Tingeren and H. Bos, Mathematical Models of Economic Growth, (New York: McGraw-Hill Book Company, Inc., 1962), pp. 2-3.

^{10/} Although Pakistan became independent in 1947, the statistical data for the first few years of independence are so unreliable and so influenced by transient factors relating to the upheavals following partition that they are more usually omitted from any analysis. Data in Pakistan are collected on a fiscal year, July-to-June, basis. For convenience I refer to calendar years rather than write the more appropriate split fiscal years.

For the period 1950 to 1960, gross national product, in constant prices, is estimated to have grown at an annual rate of about 2.6 per cent, just equal to the estimated growth of population. In the period since 1960, national product, again in constant prices, has increased by slightly over 5.4 per cent per annum and per capita income by 2.8 per cent. Investment, as a per cent of gross national product, has increased from 9.7 per cent in 1960 to 17.3 per cent in 1965, and the savings proportion has risen from 6.5 to 10.5 per cent.^{11/12/} In brief, in 1955 when Pakistan's first Five-Year Plan period began, the country was in the lower quartile of countries with respect to its investment, savings and growth rates. Since then it has moved to the upper quartile.^{13/}

Although there can be little doubt that the economy as a whole has made real progress, regional developments have shown considerable variation from this national pattern. In order to understand more fully the problem of regional development, it is necessary to look briefly at the pattern of regional growth and structural change over the past years.

The Regional Economies: Their Structure
and Growth

The composition of the regional economies is shown in Table 1.

^{11/} T. M. Khan and A. Bergan. "Measurement of Structural Change in the Pakistan Economy: A Review of the National Income Estimates, 1949/50-1963/64," Pakistan Development Review, Vol. VI (Summer, 1966), pp. 163-208.

^{12/} Pakistan, Planning Commission, Evaluation of the Second Five Year Plan, 1960-65, (Karachi: Manager of Government Publications, May, 1966).

^{13/} Hollis B. Chenery and Alan M. Strout, "Foreign Assistance and Economic Development," The American Economic Review, LVI (September, 1966), pp. 679-733.

TABLE I

Gross Provincial Product^{a/}

(1960 Factor Cost)

(Rs. Millions)

Sectors	1950		1955		1960		1965	
	East	West	East	West	East	West	East	West
1. Agriculture	8,344	6,768	8,704	6,948	9,042	7,711	11,020	8,741
2. Mining		37	-	45	-	70	8	123
3. Manufacturing	497	1,042	651	1,569	912	2,018	1,532	3,179
(a) Large scale	(85)	(342)	(200)	(802)	(406)	(1,159)	(966)	(2,190)
(b) Small scale	(412)	(700)	(451)	(767)	(506)	(859)	(566)	(989)
4. Construction	51	187	126	289	224	427	900	1,021
5. Transport and Communications	637	645	779	810	900	921	1,218	1,206
6. Others	3,283	3,884	3,556	4,445	3,894	5,320	5,242	6,797
7. Gross Regional Product	12,812	12,563	13,816	14,106	14,972	16,467	19,920	21,067
8. Population (millions)	43.29	36.18	47.70	39.87	53.58	45.03	61.30	51.10
9. Gross Regional Product Per Capita (Rs.)	296	347	290	354	278	366	325	412

^{a/} 1950-1960: T. M. Khan and A. Bergan, "Measurement of Structural Change in the Pakistan Economy: A Review of National Income Estimates, 1949/50-1963/64," Pakistan Development Review, VI (Summer, 1966) pp. 163-208.

1965: Finance Department, Government of East Pakistan, Economic Survey of East Pakistan, 1964/65 (Dacca: East Pakistan Government Press, 1965) and Pakistan Planning Commission, Evaluation of the Second Five Year Plan, op. cit.

TABLE 1

Percentage Distribution of Gross Provincial Product

[illegible]

While the role of agriculture dominates the structure of the regional economies, in West Pakistan the share of agriculture in the regional product has been declining rapidly over the period 1950 to 1965. It is, however, the share of manufacturing in the regional economies, and their growth over time, that is most striking.

At the time of partition both regions lacked any industrial base. The major share of the early industrialization effort was concentrated in West Pakistan. A variety of factors contributed to this spatial bias. The infra-structure in East Pakistan was, and to some extent continues to be, poor in comparison to that found in West Pakistan. Land costs are also higher in East Pakistan. In addition, the mere physical presence of the central government in West Pakistan undoubtedly played a role. Although one may argue over the relative importance of these and other factors, the result has been the development of a rapidly expanding and diversified industrial sector in West Pakistan. As a direct consequence of this regional bias of industrial growth, such related sectors as banking and insurance have also favored West Pakistan, probably to a larger extent than is reflected in the data in Table 1, since there the regional allocation of such services has been done officially on a simple 50:50 basis.

In analyzing the sectoral growth that has taken place in the two provinces, it again becomes apparent that one can identify two distinct time periods. From 1950 to 1959 both regional economies were relatively stagnant, although the growth in East Pakistan was significantly lower in nearly all sectors than in West Pakistan. Since 1960 both regions have had higher growth rates in all sectors, but more important, East Pakistan's economy appears to have begun to grow at a rate which halted the process of a widening in the regional per capita income differences.^{14/}

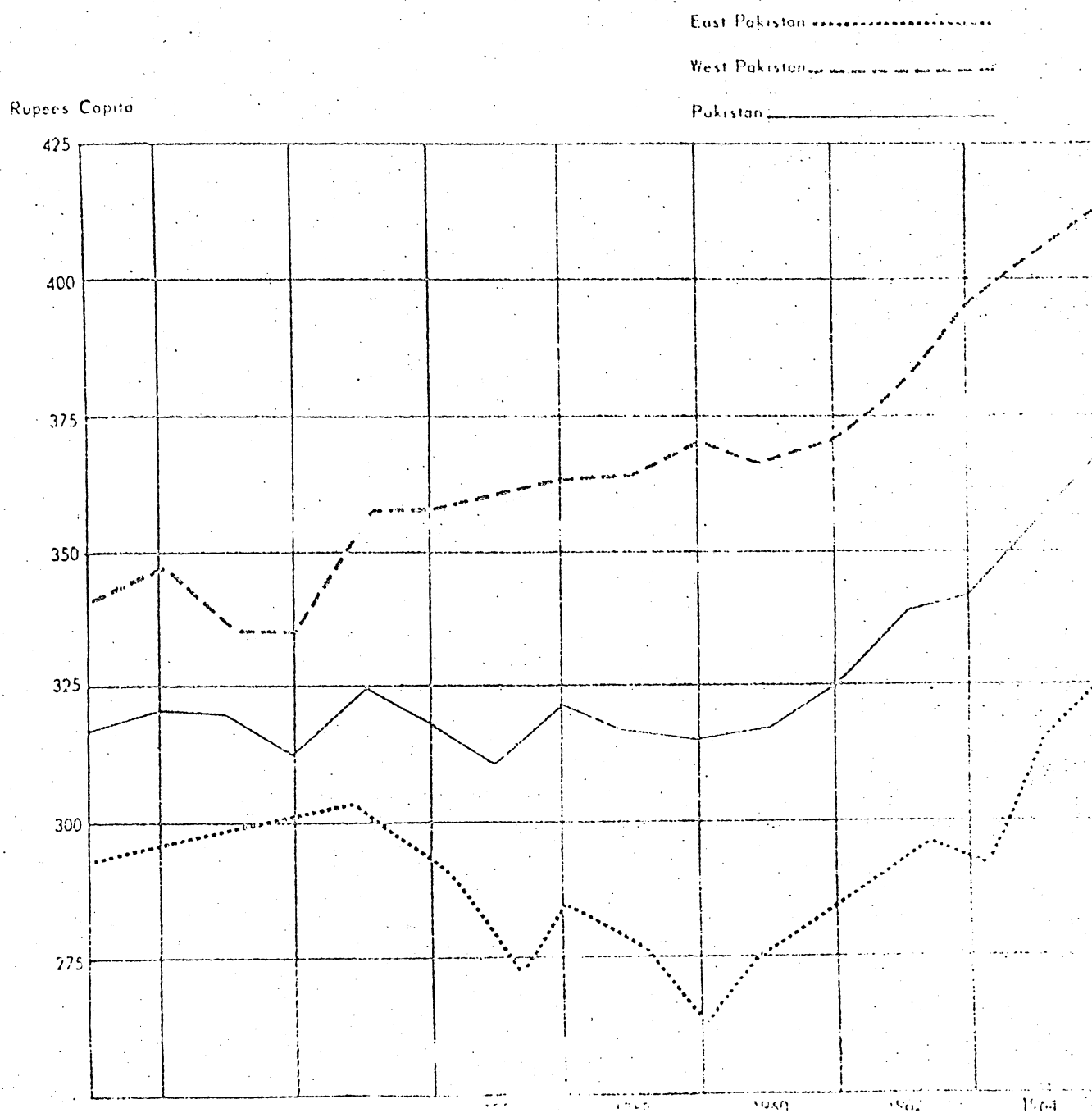
^{14/} There is some evidence that since 1960 the regional disparity in terms of income per capita has narrowed. However, the variability of the year to year data makes it difficult to draw any firm conclusions from the few observations available.

The effect of this pattern of growth on per capita regional product is shown in Figure 1. While there was a disparity in per capita product in 1950, the difference between the two regions widened till 1960. Taking East Pakistan as 100, the level of product per capita in West Pakistan stood at 116.7 per cent in 1950, rising to 131.7 per cent, in constant prices, in 1960 and declining to 126.8 in 1965. One additional factor should be noted. A more regular time path is found in West Pakistan's growth of per capita product than in East Pakistan. This reflects the more diversified structure of West Pakistan's economy. In East Pakistan, by contrast, changes in weather can still have a significant effect on the level of agricultural output and hence, on the growth rate of regional product. This is brought out, for example, by the sharp drop in the per capita product in East Pakistan for 1963 when agricultural output declined as a result of a poor rice crop.

The Regional Economies: Foreign and
Regional Trade

Perhaps no other aspect of the regional problem has involved more acrimonious debate, supported by fewer facts, than the question of net resource transfers. Exports from East Pakistan have provided the bulk of foreign exchange earnings over the past years, whereas the major share of foreign imports was destined for West Pakistan. In terms of regional trade East Pakistan has had a continued deficit on its current account, which at least for the early years was less than its surplus on its foreign trade account, thus implying a net transfer of resources to West Pakistan. Haq estimates that these transfers amounted to Rs. 210 million per annum in the period 1950 to 1955 and perhaps Rs. 100 million in the period

FIGURE 1
PER CAPITA INCOME
(Constant 1959 prices)



1956 to 1960.^{15/}

The mechanism for achieving such transfers was the combined operation of the exchange control and import licensing systems. Since exporters must surrender their foreign exchange to the central government and as the foreign exchange thus collected is licensed to importers in line with government policy, the volume of imports from abroad destined for either region can be controlled. One might expect that the regional surplus on the foreign account would, over time, be offset by a deficit on the regional trade account. Exporters are, after all, paid in domestic currency, and if this cannot be used to buy foreign merchandise, there would be a tendency for inflation eventually leading to a movement of goods from the lower to the higher price region. This offsetting tendency has not worked, primarily because the binding constraint on such movements has been a lack of shipping space for inter-regional trade and the fact that domestic currency transfers are unrestricted.

The precise measurements of such transfers is difficult, if not impossible, because of definitional questions and a lack of data relating to trade in invisibles and capital movements. Nevertheless, the total regional surpluses on the commodity trade account shown for East Pakistan in Table 2 were, certainly for the early period, of such a magnitude that even the inclusion of noncommodity trade would probably not alter the conclusion that, on balance, a transfer of resources had taken place. But regardless of what definition of resource transfer one employs, the net inflow of foreign aid must equal a region's balance of payments deficit on its foreign and regional account.^{16/} The data in Table 2 would lend at least

^{15/} Mahbub-ul Haq, The Strategy of Economic Planning: A Case Study of Pakistan, (Karachi: Oxford University Press, 1963), pp. 100-101.

^{16/} Assuming no changes in foreign exchange reserves.

TABLE 2

Foreign and Regional Commodity Trade Balances^{a/}

(Rs. Million/Current Prices)

EAST PAKISTAN

<u>Year</u>	<u>Exports</u>	<u>Imports</u>	<u>Surplus/ Deficit(-)</u>	<u>Exports</u>	<u>Imports</u>	<u>Deficit(-)</u>	<u>Surplus/ Deficit(-)</u>
1950	628	391	238	32	229	-197	41
1951	1,211	515	696	46	211	-165	531
1952	1,087	856	231	36	161	-125	106
1953	642	407	235	107	177	- 76	159
1954	645	311	334	131	370	-239	95
1955	732	332	400	181	293	-112	288
1956	1,041	376	665	221	319	- 98	567
1957	909	841	68	325	510	-185	-117
1958	988	748	240	264	690	-426	-186
1959	881	579	302	278	660	-382	- 80
1960	1,080	682	398	361	543	-182	216
1961	1,259	1,039	220	363	801	-438	-218
1962	1,301	899	402	401	832	-431	- 29
1963	1,249	1,059	190	469	918	-449	-259
1964	1,224	1,499	-275	511	844	-333	-608
1965	1,268	1,726	-458	542	857	-315	-773

^{a/} Pakistan, Central Statistical Office, Monthly Bulletin of Statistics, Various issues. (Karachi: Manager of Government Publications).

TABLE 2

WEST PAKISTAN

<u>Year</u>	<u>Foreign Account</u>			<u>Regional Account</u>			<u>Total</u>
	<u>Exports</u>	<u>Imports</u>	<u>Surplus/ Deficit(-)</u>	<u>Exports</u>	<u>Imports</u>	<u>Surplus/ Deficit(-)</u>	<u>Surplus Deficit(-)</u>
1950	565	930	-365	229	32	197	-168
1951	1,342	1,184	158	211	46	165	323
1952	922	1,504	-582	161	36	125	-457
1953	867	1,065	-198	177	107	76	-122
1954	641	845	-204	370	131	239	35
1955	491	801	-311	293	181	112	-198
1956	743	982	-240	319	221	98	-142
1957	698	1,525	-827	510	325	185	-642
1958	434	1,320	-866	690	264	426	-460
1959	444	1,036	-592	660	278	382	-210
1960	763	1,807	-1,044	543	361	182	-182
1961	540	2,181	-1,641	801	363	438	-1,203
1962	543	2,243	-1,700	832	401	431	-1,269
1963	998	2,086	-1,808	918	469	449	-1,359
1964	1,075	2,985	-1,910	844	511	333	-1,577
1965	1,151	3,674	-2,523	857	542	315	-2,208

some support for the view that the major recipient of foreign aid has been West Pakistan, even making a generous allowance for the effect of omitting invisible trade.

The Regional Economies: Investment
and Savings

While savings and investment estimates for Pakistan are extremely weak, an analysis of the pattern of investment shows that East Pakistan's share of investment has remained remarkably constant at about one third of total investment.^{17/} At times this geographic bias of investment has been justified in terms of the lack of "absorptive" capacity in East Pakistan. This has usually been taken to mean a lack of technically skilled persons needed to implement investment projects. Although the concept of absorptive capacity is difficult to quantify, East Pakistan's development effort has at times been plagued with a shortage of technically trained personnel, managerial talent, and complementary inputs. This in no way removes the possibility that other factors played a role in the allocative decision-making process. The location of the central government in West Pakistan gives a distinct advantage to that province. "West Pakistan not only hosts the central government but also holds nearly 90 per cent of its positions. Thus the region is in the not unenviable position of controlling, through its hold over the central government with all its economic controls, the

^{17/} Cf. Haq, op. cit., pp. 254-255 and Pakistan, Planning Commission, Evaluation of the Second Five Year Plan, op. cit., pp. 170 and 201-209.

allocation of strategic development resources available to the entire country."^{18/} Regardless of how one wishes to explain the allocative bias, two factors stand out. It is likely that East Pakistan's absorptive capacity was indeed lower than that of West Pakistan and that to a large extent the lack of investment in East Pakistan must be counted as a major element in the inability to make any substantial reduction in the level of disparity.

Table 3 shows a comparison of regional savings and investment. Despite the caution with which one must interpret these series, it appears that the average savings rate in East Pakistan is lower and more variable than in West Pakistan. This variability of the savings rate is again a reflection of the year to year fluctuations in the level of agricultural output and total regional product in East Pakistan. For the Second Five Year Plan period the marginal rate of savings in East Pakistan comes to 18 per cent while that of West Pakistan was 15 per cent. The bulk of the increase in savings for the period 1961 to 1965 thus originated in East Pakistan.

Long Term Objectives for Pakistan

Despite the fact that the actual differences between the per capita product levels in the two regions of Pakistan is not very great as compared to that found in other countries,^{19/} it must be

^{18/} Md. Anisur Rahman, "East and West Pakistan: A Problem in the Political Economy of Planning," Economic Development Series, Report No. 59, (Cambridge: Harvard University, Development Advisory Service, Center for International Affairs, 1967), p. 22. (Mimeographed).

^{19/} For a comparison of regional income differences for some twenty-five countries see Jeffrey G. Williamson, "Regional Inequality and the Process of National Development," Economic Development and Cultural Change, XIII, No. 4, Part II (July, 1965) pp. 1-84.

TABLE 3

Regional Savings and Investment, 1961-1965

(Rs. Millions/Current Prices)

	<u>1961</u>		<u>1962</u>		<u>1963</u>		<u>1964</u>		<u>1965</u>	
	<u>East</u>	<u>West</u>	<u>East</u>	<u>West</u>	<u>East</u>	<u>West</u>	<u>East</u>	<u>West</u>	<u>East</u>	<u>West</u>
act (factor cost) ^{a/}	16,937	17,849	17,994	18,488	18,970	19,672	20,392	21,123	22,510	23,170
	437	1,115	492	1,237	524	1,392	672	1,658	821	2,115
	43	61	56	68	72	89	181	89	186	139
act	17,331	18,903	18,433	19,657	19,422	20,975	20,883	22,692	23,145	23,146
vestment	1,355	3,205	1,963	3,837	1,818	4,433	2,420	4,790	2,929	3,401
t (-)	160	-1,633	365	-1,833	131	-2,086	-308	-2,389	-406	-2,847
Foreign ^{c/}										
t (-)	-406	406	-482	482	-494	494	-366	366	-347	347
regional ^{c/}										
t (-)	-246	-1,227	-117	-135	-363	-1,592	-674	-2,023	-753	-2,508
total ^{c/}										
ngs	1,109	1,978	1,846	2,436	1,455	2,840	1,746	2,767	2,176	2,901
GRP	7.8%	17.0%	10.6%	19.5%	9.4%	21.1%	12.0%	21.1%	12.7%	21.5%
RP	6.4%	10.5%	10.0%	12.6%	7.5%	14.1%	8.4%	12.2%	9.4%	11.5%
vestment financed										
	81.8%	61.7%	94.0%	64.8%	80.0%	64.1%	72.1%	57.8%	74.2%	53.7%

Commission, Evaluation of the Second Five Year Plan, op. cit.imate of Regional Indirect Taxes, 1959/60-1964-65 (Karachi: Harvard Advisory Group, April 1966)a in Table 2 and Joseph J. Stern, Inter-Industry Relations in East Pakistan, 1962/63 (Karachi: of Development Economics, forthcoming).

TABLE 3

Regional Savings and Investment
(Rs. Millions/Currency)

	<u>1961</u>		<u>1960</u>
	<u>East</u>	<u>West</u>	<u>East</u>
1. Gross Regional Product (factor cost) ^{a/}	16,937	17,849	17,994
2. Indirect taxes ^{b/}	437	1,115	492
3. Subsidies ^{b/}	43	61	56
4. Gross Regional Product (market prices)	17,331	18,903	18,433
5. Gross Regional Investment	1,355	3,205	1,963
6.1 Surplus (+)/Deficit (-) current account, foreign ^{c/}	160	-1,633	365
6.2 Surplus (+)/Deficit (-) current account, regional ^{c/}	-406	406	-482
6.3 Surplus (+)/Deficit (-) current account, total ^{c/}	-246	-1,227	-117
7. Gross Regional Savings	1,109	1,978	1,846
8. Investment as a % of GRP	7.8%	17.0%	10.6%
9. Savings as a % of GRP	6.4%	10.5%	10.0%
10. Proportion of investment financed by own savings	81.8%	61.7%	94.0%

^{a/} Pakistan, Planning Commission, Evaluation of the Second Five

^{b/} Wouter Tims, An Estimate of Regional Indirect Taxes, 1959/60-
mimeographed.

^{c/} Calculated from data in Table 2 and Joseph J. Stern, Inter-Ind-
Pakistan Institute of Development Economics, forthcoming).

stressed that the problem in Pakistan is almost unique in character. In no other country have the two regions been separated by a thousand miles of foreign territory, posing enormous obstacles for inter-regional mobility of goods and labor. And the fact remains that regional disparities are more tolerable when the poorer region can at least enjoy the minimum necessities of life. In Pakistan, even West Pakistan, the relatively affluent region is living close to a subsistence level. The disparity in regional welfare is therefore particularly painful.

As a consequence of the political pressures generated by the disparity in regional welfare, the removal of all differences in regional incomes has been made a Constitutional obligation. More recently, the Planning Commission has proposed that this target be achieved by the end of the Perspective Plan period, 1985. At the same time dependence on foreign aid is to be terminated and per capita income to be doubled.^{20/} The setting of these objectives has been done with little analysis that would bring to light alternative growth patterns and the opportunity cost of meeting a strict regional income equality target. The objective of the present analysis presented in both macro-terms and in terms of sectoral composition is aimed primarily at highlighting the regional growth problem and bringing to the fore the possible effects such a regional target may have on national development.

^{20/} Pakistan, Planning Commission, The Third Five Year Plan, (Karachi: Government of Pakistan Press, May, 1966) pp. 17-30.

III. Regional Growth: The Macro-Economic Implications

The dynamic linear programming model used to analyze the time phasing characteristics of the development path for the economy as a whole and for the two regions is an adaptation of the analytic framework developed by Chenery and MacEwan^{21/} and Chenery and Dorfman.^{22/} As the assumptions underlying the formulation of this model have been described extensively in the articles cited above, the description below will be brief.

The major feature of the model is the realistic assumption of a permissible divergence between savings and investment, the gap being filled by foreign aid. Two sectors are identified, showing the capacity of the economy to transform domestic resources into foreign exchange. A "trade-improving" production sector is specified which produces either "non-traditional exports" or import substitutes for foreign or regional trade. The results of shifts from production in the regular "traditional" sectors to the "trade-improving" sectors causes a rise in the economy-wide capital-output ratio reflecting the operation of the principle of

^{21/} Hollis B. Chenery and Arthur MacEwan, "Optimal Patterns of Growth and Aid: The Case of Pakistan," The Theory and Design of Economic Development, eds. Irma Adelman and Eric Thorbecke (Baltimore: Johns Hopkins University Press, 1966).

^{22/} Hollis B. Chenery and Robert Dorfman, "Optimal Growth Patterns in an Open Economy," (Cambridge: Center for International Affairs, Harvard University, 1966). Mimeographed.

comparative advantage. Only two scarce factors are considered: foreign exchange and capital. Labor is not taken as a scarce resource, although the transformation of unskilled labor to skilled labor could be considered a part of the investment process. Regional migration is also omitted from consideration. Given the distance and cost involved in inter-regional migration and the differences in language and social customs, population movements are not likely to be a major factor in Pakistan.

Specifically, the following function is to be maximized:

$$\begin{aligned} \text{Max } W = & \sum_{t=1}^T \sum_{j=1}^n \frac{C_{t,j}}{(1+i)^t} + \sum_{j=1}^n \sigma_j V_{T,j} \\ & - \gamma \sum_{t=1}^T \frac{F_t}{(1+i)^t} \end{aligned} \quad (1)$$

where:

$$\sigma_j = \delta (1-\alpha_j) \sum_{t=1}^{\infty} \frac{(1+\theta_j)^t}{(1+r)^{T+t}}$$

The welfare function has three parts: (i) the discounted flow of consumption over the period 1965 to 1985; (ii) an indicator (σ_j) of the discounted value of consumption in all post plan years and (iii) the discounted value of the flow of foreign aid with a weight γ representing the price of foreign assistance.^{23/} The definitions of all the variables and parameters are given in Appendix Tables 1 and 2.

^{23/} For a more complete discussion of this particular welfare function, see Chenery and MacEwan, op. cit.

Definitional Equations

Gross regional product is defined as the sum of output of the regular production sector in each region and total trade-improving output which is split between that part whose foreign exchange earning is used in the producing region ($V_{t,j,j}^1$) and that portion destined for inter-regional transfers ($V_{t,j,k}^1$)

$$V_{t,j} = V_{t,j}^0 + V_{t,j,j}^1 + V_{t,j,k}^1 \quad (2)$$

Similarly, total gross regional investment is the sum of investment in each sector.

$$I_{t,j} = I_{t,j}^0 + I_{t,j}^1 \quad (3)$$

Regional income is defined as the gross regional product plus (minus) net regional transfers.

$$Y_{t,j} = V_{t,j} \pm R_{t,j} \quad (4)$$

where such transfers are given by:

$$R_{t,k,j} = V_{t,k,j}^1 - V_{t,j,k}^1 \quad (4a)$$

From this regional expenditure is defined as:

$$V_{t,j} = C_{t,j} + I_{t,j} + E_{t,j} + e_{t,j.k} + V_{t,j,j}^1 - M_{t,j} - m_{t,j.k} + R_{t,j} \quad (5)$$

Savings, net of transfers, are equal to investment less the capital inflow:

$$S_{t,j} - R_{t,j} = I_{t,j} - F_{t,j} \quad (6)$$

The region's trade-gap, which must be filled by the capital inflow, is determined by the region's export of traditional exports to the rest of the world, less imports and the current account balance for regional trade in terms of traditional goods, minus the trade-improving output for foreign trade.

$$F_{t,j} = M_{t,j} + m_{t,j.k} - E_{t,j} - e_{t,j.k} - V_{t,j}^1 \quad (7)$$

Traditional exports, foreign and regional, are assumed to grow at an exogenously determined rate and are produced by the traditional sectors.

$$E_{t,j} = E_{0,j}(1 + u_j)^t \quad (8a)$$

$$e_{t,j} = e_{0,j.k}(1 + \pi_j)^t \quad (8b)$$

Two further conditions are imposed. The regional exports from one region must equal the regional imports in the receiving region:

$$e_{t,j.k} = m_{t,k,j} \quad (8c)$$

and the sum of the capital inflows in each region is equal to total foreign aid for the economy as a whole:

$$F_t = F_{t,j} + F_{t,k} \quad (8d)$$

Structural and Behavioral Constraints

Since labor is assumed to be in surplus, production in each sector is limited by the capital stock in that region. Thus the capacity limit for regular production is given by:

$$V_{t,j}^0 \leq \frac{1}{k_{0,j}} K_{t,j}^0 \quad (9)$$

and that for trade-improving production and transfers by:

$$V_{t,j,j}^1 + V_{t,j,k}^{11} \leq \frac{1}{k_{1,j}} K_{t,j}^1 \quad (9a)$$

The regional economies are characterized by diminishing returns to investment. The use of a "step" function to approximate, by linear segments, the diminishing productivity curve of investment, necessitates a re-definition of investment.

$$I_{t,j}^0 = I_{t,j}^{01} + I_{t,j}^{02} + I_{t,j}^{03} \quad (10)$$

$$\text{and } I_{t,j}^1 = I_{t,j}^{11} + I_{t,j}^{12} + I_{t,j}^{13} \quad (11)$$

The total capital stock available for production in each region and each sector is given by:

$$K_{t+1,j}^0 = K_{t,j}^0 + I_{t,j}^{01} + \beta_{2,j} I_{t,j}^{02} + \beta_{3,j} I_{t,j}^{03} \quad (12)$$

and

$$K_{t+1,j}^1 = I_{t,j}^{11} + \beta_{2,j} I_{t,j}^{12} + \beta_{3,j} I_{t,j}^{13} \quad (13)$$

where β_j defines the relative productivity of investment as the economy moves downward on the marginal productivity curve.

The observed limits on the regional economy to absorb increases in the supply of capital are introduced by making investment increases a function of existing capital and an explicit weighting factor (ϕ_j) which determine the permissible growth of investment.

$$\begin{aligned} I_{t,j}^{01} + I_{t,j}^{11} &\leq \lambda_{1,j} (K_{t,j}^0 + K_{t,j}^1) - \phi_j \\ I_{t,j}^{02} + I_{t,j}^{12} &\leq \lambda_{2,j} (K_{t,j}^0 + K_{t,j}^1) - \phi_j \\ I_{t,j}^{03} + I_{t,j}^{13} &\leq \lambda_{3,j} (K_{t,j}^0 + K_{t,j}^1) - \phi_j \end{aligned} \quad (14)$$

Maximum savings in any year are a function of base year savings and increases in regional production.

$$S_{t,j} \leq S_{0,j} + \alpha(V_{t,j} - V_{0,j}) \quad (15)$$

while demand for imports is a function of base year imports and changes in regional production and investment:

$$M_{t,j} + m_{t,j,k} \geq M_{0,j} + m_{0,j,k} + \eta_{0,j}(V_{t,j} - V_{0,j}) + \eta_{1,j}(I_{t,j} - I_{0,j}) \quad (16)$$

It is possible to express most policy targets as a part of the welfare function if the appropriate price associated with such a target is known. Since in general it is not possible to specify the cost of such targets a priori, it is simpler to define certain additional policy targets as constraints to the model. Two objectives of the perspective plan are introduced explicitly. Foreign aid is to be terminated at some specified year, and regional income per capita must be equalized by 1985. In addition, it is necessary to ensure that future regional income growth is such as to maintain regional parity. Thus,

$$F_t \leq 0 \quad \text{for } t = T-n; T \quad (17)$$

$$\text{and } Y_{t,j} \left(\frac{1}{N_{t,j}} \right) = Y_{t,k} \left(\frac{1}{N_{t,k}} \right) \quad \text{for } t = T-n; T \quad (18)$$

In addition, consumption per capita may not decline.

$$C_{t,j} \geq C_{t-1,j} (1+p_j) \quad (19)$$

Similarly, unrealistic declines in investment and regional income per capita are ruled out. Thus,

$$I_{t+1,j} \geq I_{t,j} \quad (20)$$

$$\text{and } Y_{t+1,j} \left(\frac{1}{N_{t+1,j}} \right) \geq Y_{t,j} \left(\frac{1}{N_{t,j}} \right) \quad (21)$$

Alternative Forms of the Model

Although the regional income target is clearly defined in the Pakistan perspective plan, three alternative patterns for regional growth can be specified. Thus the possibility of the regional disparity widening for some time is at first ruled out by stipulating that:

$$Y_{t+1,j} \left(\frac{1}{N_{t+1,j}} \right) - Y_{t+1,k} \left(\frac{1}{N_{t+1,k}} \right) \leq Y_{t,j} \left(\frac{1}{N_{t,j}} \right) - Y_{t,k} \left(\frac{1}{N_{t,k}} \right) \quad (22)$$

Furthermore, for political reasons it may be necessary to place an upper bound on regional income transfers and even to terminate income and resource transfers at some time. The first constraint is given by:

$$R_{t,j} \leq qV_{t,j} \quad (23)$$

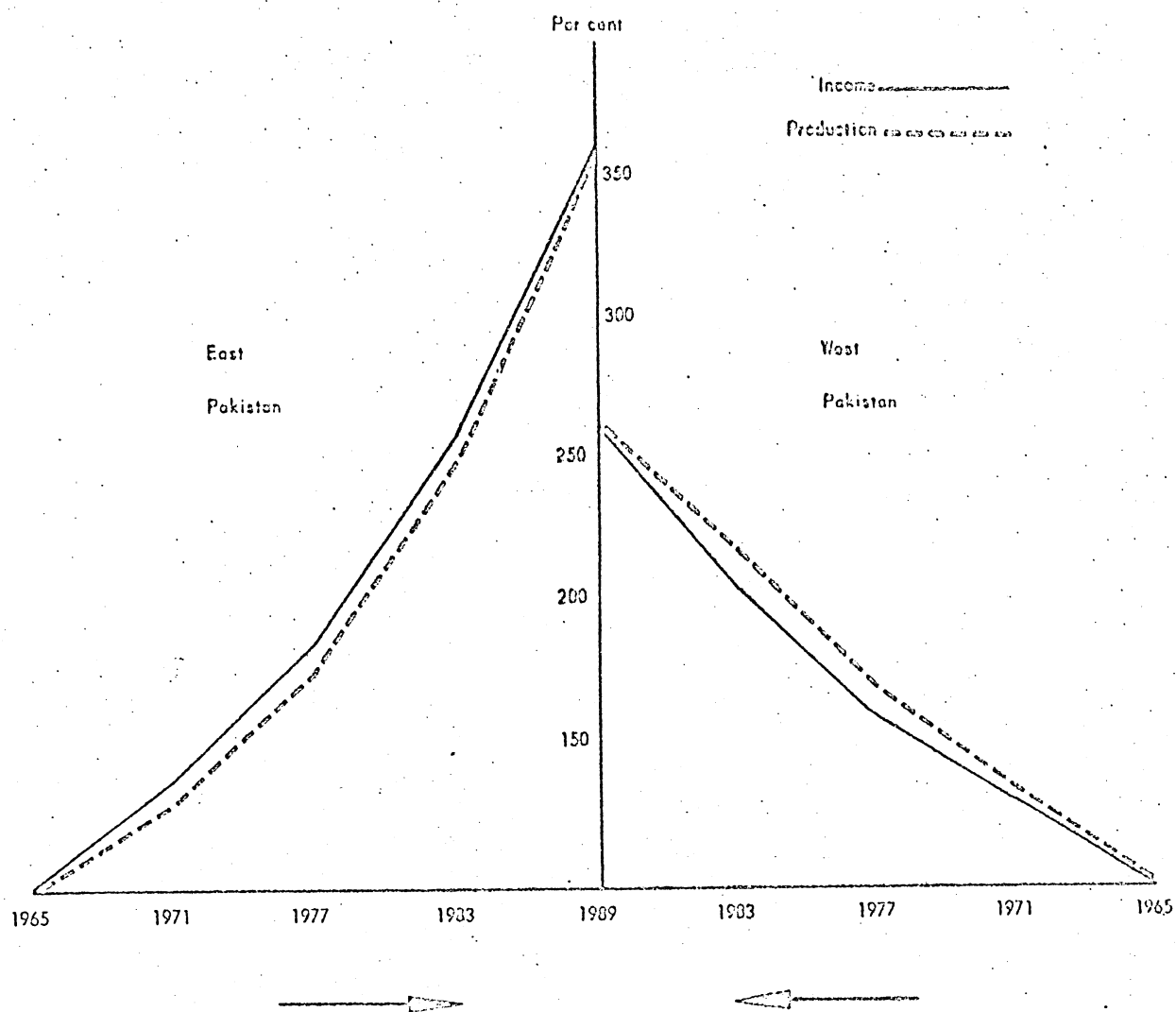
and the second by:

$$F_{t,j} + R_{t,j} = 0 \quad \text{for } t = T-n \quad (24)$$

The Basic Solution

The growth of regional income and production in the basic solution is shown in Figure 2. (The values of all the variables in the solution and their shadow prices are given in Appendix Tables 3 and 4). By 1971, which corresponds approximately to the end of the Third Five Year Plan, the difference in regional per capita income has been reduced to 26 per cent, falling

FIGURE 2
Index of Income and
Production in the
Basic Solution



to 20 per cent by 1979, and is eliminated by 1986.^{24/} This pattern of regional growth and diminishing per capita income disparity corresponds, at least for the early years, closely to that projected by the Planning Commission. The primary difference between the model results and the Perspective Plan projections is the Planning Commission's assumption that there will be a sharp drop in the level of disparity between 1975 and 1980 while the model solution postpones the major decrease in disparity till the period 1980-1985.

The process by which the regional incomes are equated is the combination of a high growth rate in East Pakistan, as high as permitted by the absorptive capacity of that province, and the redistribution of income and resources from West Pakistan used either for an increase in investment or consumption in East Pakistan. The result is a terminal year per capita income level of Rs. 640 in both regions. For the period as a whole, income in East Pakistan grows at an annual compound rate of 5.5 per cent and at 4.0 per cent in West Pakistan, implying an annual growth rate of 4.9 per cent for the economy as a whole.

This rate of growth for the national economy is well below that indicated in the Perspective Plan where a growth rate of 7.2 per cent per annum is forecast. Although no attempt has been made to choose precisely those parameters which would reproduce the long-term growth pattern forecast by the Planning Commission, it is of some interest to see what effect the regional constraint

^{24/} The model was run for eight periods, each scaled to represent three years, in order to cut down on the computational time required per solution. Thus $t=0$ is equivalent to plan year 1965; $t=1$ to 1968; $t=2$ to 1971...and $t=8$ to 1989. Consequently, there is no direct correspondence between the model time periods and the initial years of each successive five year plan encompassed in the Perspective Plan.

has. Using precisely the same parameters as in the basic solution, but eliminating all regional considerations, a growth rate of 6.8 per cent appears feasible. Yet in terms of regional equity this goal is achieved with a sharp increase in the level of disparity. Per capita income in this solution is Rs. 633 in East Pakistan and for West Pakistan, Rs. 1208. Thus without any attempt to ameliorate regional welfare, the terminal income level in East Pakistan is only slightly lower than in basic solution while that of West Pakistan is substantially higher. It thus becomes clear that the major burden of equalizing per capita incomes is borne by West Pakistan with but a minor increase in the welfare of East Pakistan.

The patterns of investment and foreign aid inflow for each province differ. (See Figures 3, 4, and 5). In East Pakistan it is the maximum growth of investment constraint that is binding through period 6 (1983), while in West Pakistan the minimum growth of investment constraint is operative. Thus the combination of the high savings rate and the low investment level in West Pakistan permits that province to finance its own investment needs and regional transfers. Regional savings in East Pakistan rise as rapidly as possible given the marginal rate of savings, so that by the terminal year of the analysis, the regional savings-investment gap is eliminated. It is, in fact, this autarchic requirement which imposes a severe constraint on the pattern of regional growth. As long as regional production and income in East Pakistan are equated in 1989, the terminal income level is primarily set by East Pakistan's own growth potential while the growth in West Pakistan can merely adjust to this level. Finally, a sharp reduction in the aid inflow to West Pakistan is observed. Beyond 1979 total foreign aid is destined for East Pakistan.

Alternative Patterns of Growth

While it is clear from the basic solution that the equal income target is a feasible one, the cost to the economy is more clearly brought out by a consideration

FIGURE 3

Foreign Aid in the Basic Solution

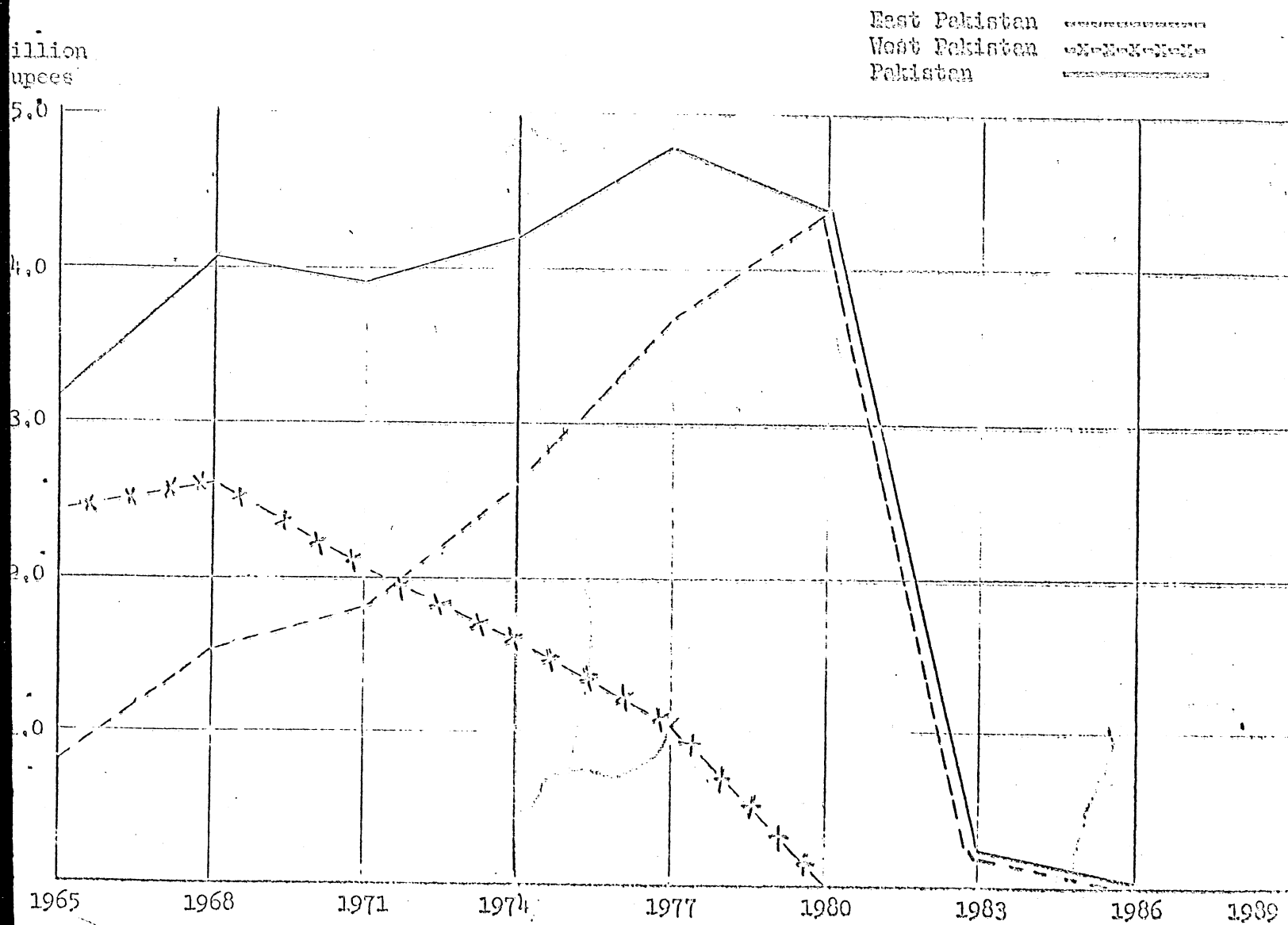


FIGURE 4

Investment and Savings
in East Pakistan
(Basic Solution)

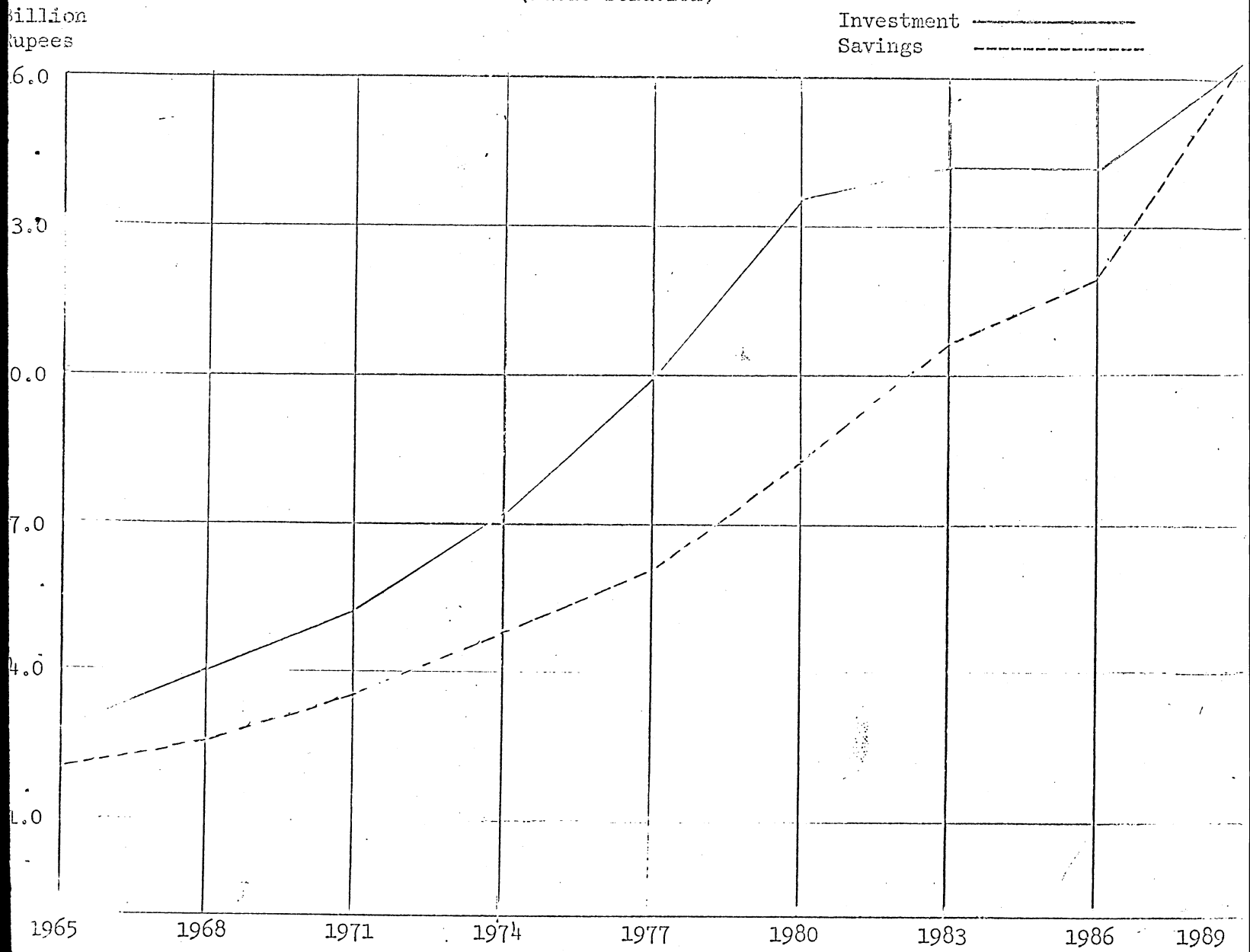
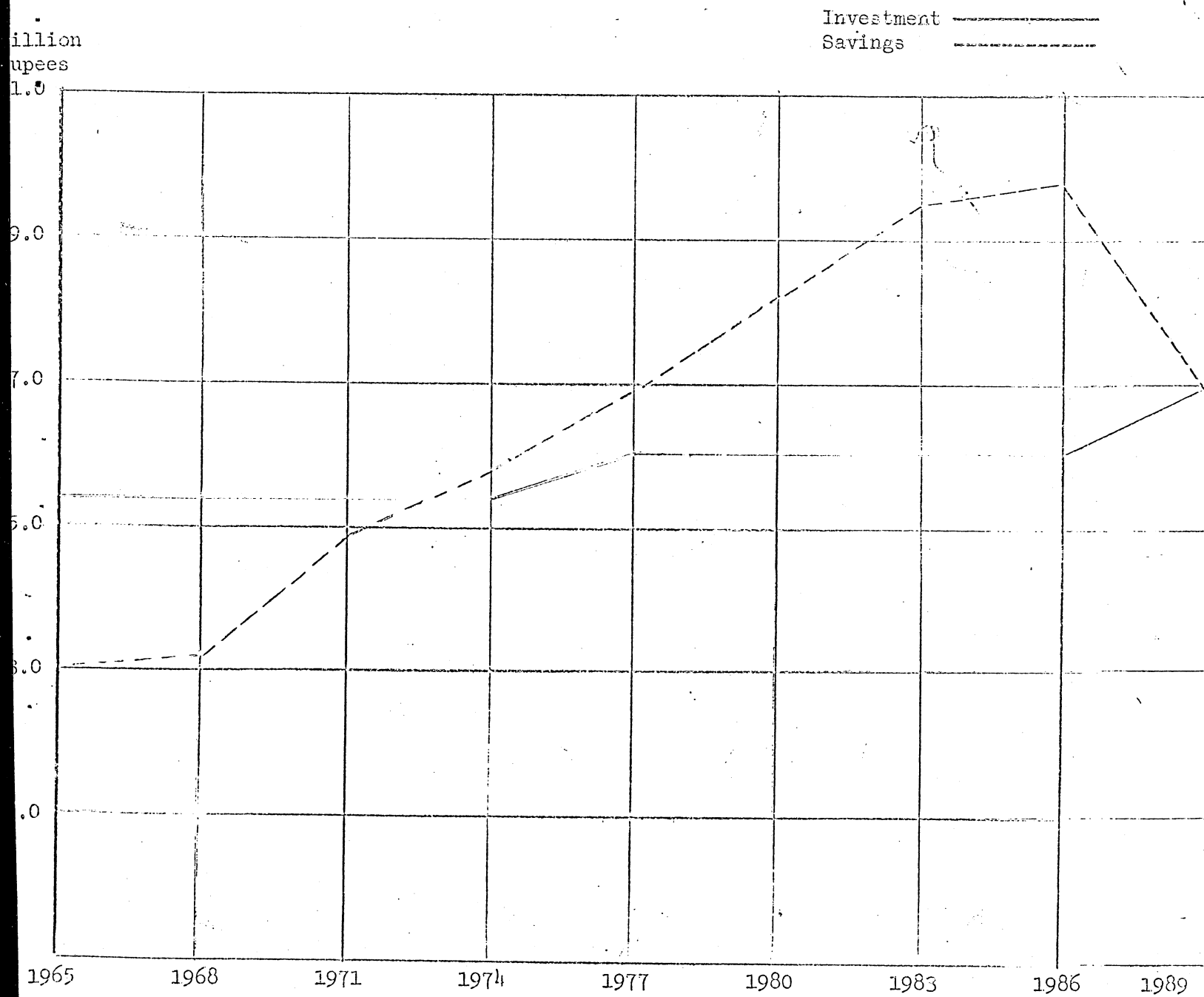


FIGURE 5

Investment and Savings
in West Pakistan
(Basic Solution)



of alternative growth paths. Maintaining the equal income target but permitting regional transfers to continue beyond 1989 allows an increase of nearly 10 per cent in the terminal income level. This increase comes about as follows. The higher growth in West Pakistan permits a higher level of regional savings and hence inter-regional transfers. The limit on such transfers is now West Pakistan's ability to mobilize savings, and the terminal income level is no longer set by East Pakistan's own productive capability.^{25/}

If in addition to the relaxation on the regional production-income gap a deterioration in the disparity measure is permitted, a further increase in the terminal income levels of both regions is possible. This solution involves a rapid rate of growth of income in West Pakistan so that this province reaches a level of per capita income of Rs. 703 in 1977. There is no further growth of income per capita for the remaining periods. This rapid initial growth of income in West Pakistan makes possible the generation of a higher level of savings which can then be used to eliminate the regional income difference rather rapidly. However, it should be noted that the level of disparity widens to 50 per cent before beginning to decline and eventually being eliminated.

Finally, consideration is given to the case where the redistributive effect is limited. In the basic solution such inter-regional transfers rise to 6.0 per cent of West Pakistan's income in 1974, and for the period as a whole, average 4.8 per cent of income in that region. Such a redistributive effort may be intolerable on political grounds. Arbitrarily limiting such transfers to 3 per cent of income in West Pakistan reduces terminal income levels in both regions to Rs. 634 as compared to Rs. 640 in the basic solution. Thus if the regional parity target is maintained but political opposition to a redistribution effort arises in West

^{25/} The effects on regional growth of varying the policy constraints are summarized in Appendix Table 5.

Pakistan, the result will be a lower level of welfare for the population as a whole. And for the alternative solutions considered above, where regional transfers play an even greater role, the cost in not permitting such transfers is an even greater loss in potential income.

The effect of a number of such alternative regional policies on the terminal income level is shown in Figure 6.

Alternative Regional Growth Targets

The analysis has so far concentrated on alternative policy choices all of which were assumed to operate within the framework of meeting the Constitutional requirement of equating regional per capita incomes and to achieve this target by 1985. It is likely, however, that once a clearer consideration of the cost to the economy, in terms of potential growth foregone, is presented, the target date for achieving parity will be postponed. While the extreme solution where regional equity considerations are omitted entirely presents a result in terms of regional disparity that is likely to be politically unacceptable, a more realistic target might be to equate regional per capita growth rates. This implies that the present level of disparity would remain constant, at least over the Perspective Plan.

Such an equal regional growth rate target can be considered as one end of a spectrum of possible regional targets, all of which might be considered politically acceptable, while at the other extreme is the strict regional parity solution. By allowing the model to first generate an equal regional growth rate solution and then parametrically varying downward the permissible level of disparity, a curve can be derived showing the various levels of income attained by the economy as a whole, and implicitly, for each region. (See Figure 7). Thus with a 5 per cent difference in regional per capita incomes in 1989, the per capita income in East Pakistan increases by 1 per cent over the strict parity solution, while if the

FIGURE 6

Growth of Per Capita Income in East

Pakistan Under Alternative

Regional Policies

- A-1: Basic solution
- A-2: Regional Transfer in terminal year
- B-2: No Time path for removal of disparity specified
- C-2: Regional transfers limited

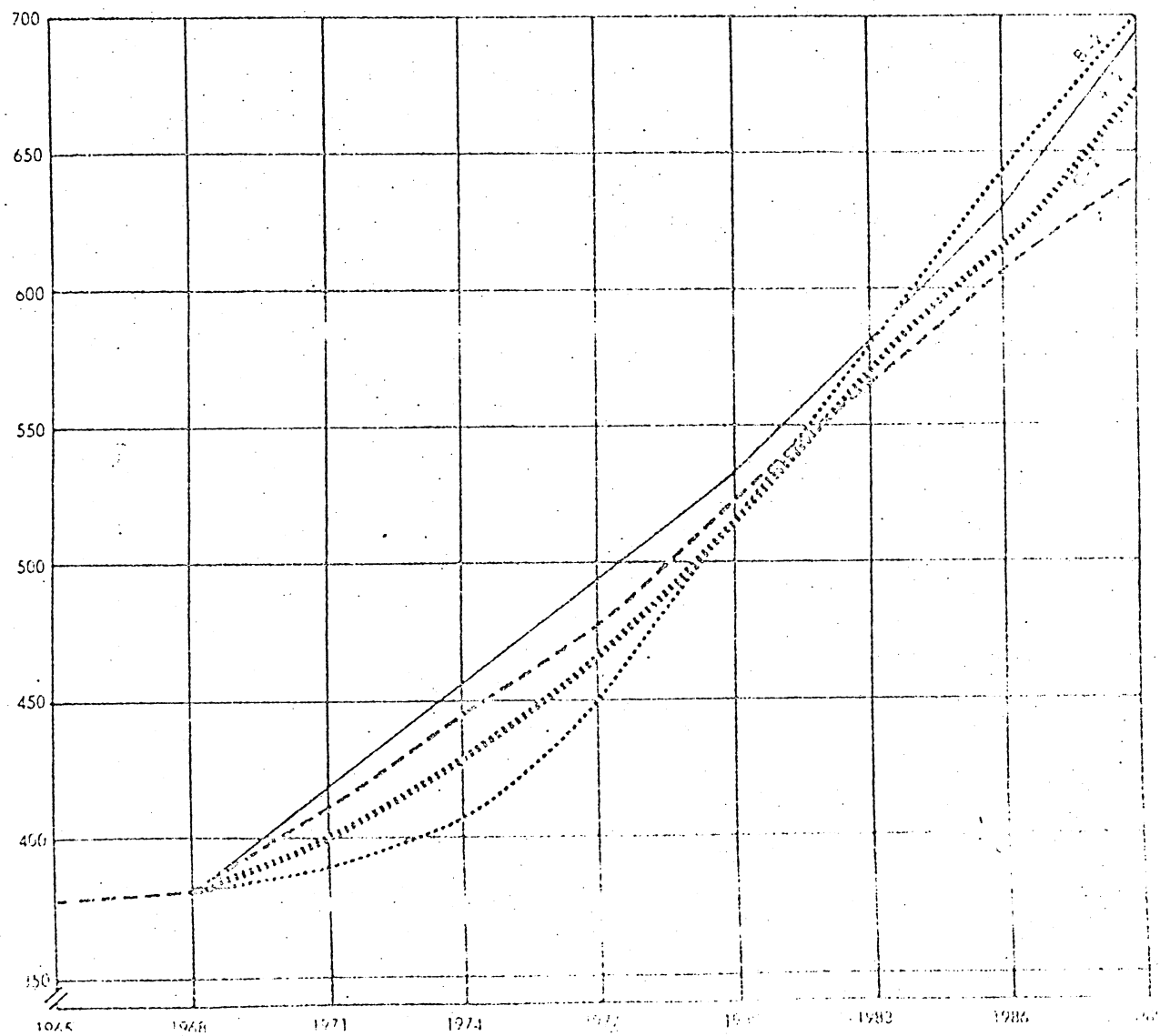
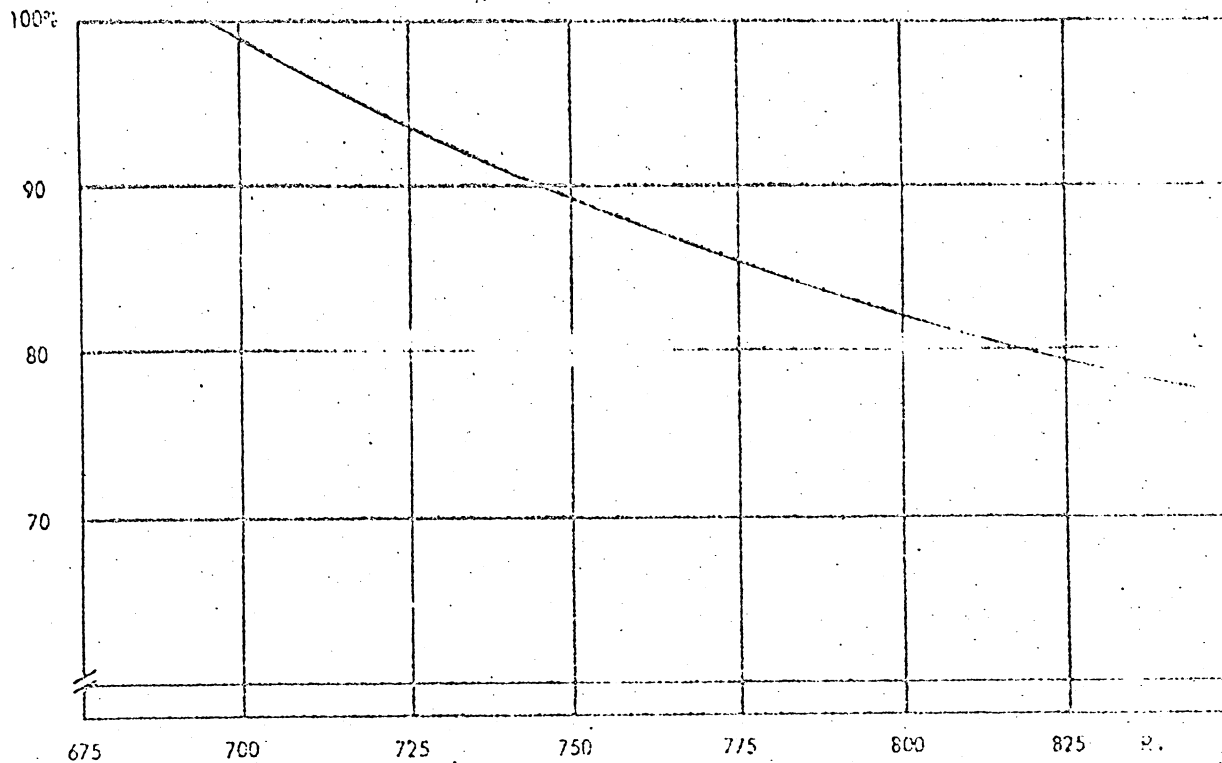


FIGURE 7
Effect on Total Income Per Capita
of Alternative Regional
Targets^a

Ratio of per capita
income East to West
Pakistan



Total per capita income, 1989

^a

Based on solutions permitting regional transfers in 1989.

target is to equate regional per capita growth rates, an increase of nearly 6 per cent in per capita income in East Pakistan is possible.^{26/}

The alternatives open to the government policy makers present an interesting opportunity for political bargaining. In return for a relaxation of the regional disparity constraint in which the Planning Commission is presently forced to operate, it could offer East Pakistan the possibility of a higher future income level. For West Pakistan the choice is also for a higher income level but a cost of permitting considerable redistribution of income over time. Like all bargaining situations these options should be more correctly stated in terms of probable outcomes rather than clear certainties. Although it is possible to show both regions better off, given the simplistic structure of the model, the attractiveness of such alternative regional targets will depend to a considerable extent on the degree of certainty with which the policy makers of each province view these alternatives. The major purpose of presenting such alternatives is primarily to permit consideration of a wider choice for framing regional policies. And such a reformulation of the present restrictive regional policy is clearly called for if national growth as well as regional welfare is considered an objective.

^{26/} See Appendix Table 5.

IV. Regional Growth and Structure of the Regional Economies

As previously noted, it will be desirable to quantify, in terms of the sectoral structure, the macro-economic growth patterns derived from the "time-phasing" model. Such a procedure may well introduce some inconsistencies in the analysis. While on balance these may not distort the results unduly, it is necessary to spell out some of these difficulties.

It is of some importance to specify the initial conditions for both models consistently. This can, in general, be done without great difficulty. More important is the need to ensure comparability over time in both models. The main divergence which is likely to occur is in the relationship of the sectoral capital-output ratios and the aggregate capital-coefficients used in the dynamic model. As an initial condition the aggregate capital-coefficients for each region can be calculated from the sectoral composition of regional product and the capital-coefficients associated with each sector. Over time, however, the weighted sum of the sectoral capital-coefficients will change as the relative output levels of the various sectors change. Unfortunately, neither the direction nor magnitude of such a change can be estimated a priori. One possible solution, therefore, is to solve the "time-path" model using a constant capital-coefficient and then using the results of the dynamic model to specify a number of the

exogenous variables in the sectoral model. The output levels derived from solving the sectoral model will, in turn, imply changes in the aggregate regional capital-coefficients. The sensitivity of the dynamic model to such changes in the capital-coefficients can then be tested. If the "time-path" model is highly sensitive to such changes, a recursive procedure should be adopted until a set of capital-coefficients is generated whose value over time approximates that derived from the changes in the sectoral composition of output.

A second difference between the "time-path" model and the sectoral model is that the regional economies have been characterized by diminishing returns to investment in the aggregate model. The sectoral model will have no such apparent characteristic. This difference, however, reflects the need to represent in a highly aggregated model the reallocation of resources to exchange earning and savings activities, in which their productivity is progressively lower, until equilibrium is reached. In a two-sector model such a reallocation procedure is best represented by assuming diminishing returns to capital as the amount of investment is increased. For the sectoral model this reallocation of resources is made a function of the need to meet a minimum level of output for each sector and to allocate investment to more than one import substituting activity. That is, although a specific sector may be most attractive in terms of its relative

saving of scarce resources in producing output, demand considerations will force the economy to shift to the next most attractive sector. Finally, a problem arises from the use of separate terminal conditions for the two models. While each stage of the analysis yields an optimal solution, there is no simple way of assuring that precisely the same optimal path would be chosen if the entire problem were solved in one intricate model.

It is clear that the relationship between the two models is not a straightforward one and that some inconsistency may be introduced into the analysis. This "cost" should, however, be weighed against the additional insights to be gained by allowing greater scope for analysis of the dynamic as well as sectoral aspects of long-term growth when regional as well as national objectives are considered. It is of course possible to test for the effects of at least some of these inconsistencies on the overall results. Insofar as these effects are negligible they can be ignored. This is especially true when one considers the general uncertainties that accompany any long-range planning exercise. Thus while as a general procedure the idea of solving a planning problem by breaking it down into stages may well be incorrect, it seems that as a first approximation, the results can be accepted.

In order to allow for a considerable degree of disaggregation, the sectoral model is limited to a static analysis covering

two time periods, 1965 to 1974 and 1974 to 1986.^{27/} The constraints of the sectoral model, by groups, with the exogenous variables appearing on the right hand side, are given in Table 4, and the definitions of the variables and parameters are given in Table 5. In what follows, a brief description of the various equations is given.

(1) Output Determination. Twenty-one commodity balances are identified for each region. Total consumption, exports and traditional regional imports are set at levels determined by the "time-path" model. Consumption of each commodity is given by the change in consumption expenditure and the relevant regional expenditure elasticities. The commodity structure of traditional exports is derived from the commodity composition in the base-year, except that account is taken of the likely inelastic demand for raw jute and jute products.

The inter-industry coefficients (a_{ij}) are derived from separate input-output tables for East and West Pakistan. Separate sectors are identified for traditional and trade-improving output. The nontraditional sectors are characterized by higher capital coefficients but presumably have the same input structure as the traditional output producing sectors.

(2) Investment Demand. Equation (2a) is definitional. Total

^{27/} These unequal time segments result from the use of three-year time periods in the "time-phasing" model.

TABLE 4

Sectoral Model Equations

<u>Equation</u> <u>Set No.</u>	<u>Equation</u>	<u>Constant or</u> <u>Controlled</u> <u>Variables</u>	<u>No. of</u> <u>Equation</u>
1. <u>Output Determination:</u>			
	$X_i - \sum_{j=1}^n k_{ij}^a X_j - I_i - R_i - k_i^r I_i + M_i + k_i^m I_i$	$= C_i + E_i + k_i^l I_i - k_i^m I_i$	(42)
2. <u>Investment Demand</u>			
a)	$\sum_{i=1}^m k_i^I I_i + \sum_{i=m+1}^n k_i^I I_i + MI$	$= k^I I$	(2)
b)	$r_k I_i - \sum_{j=1}^m k_{ij}^b X_j + \sum_{j=m+1}^n k_{ij}^b \hat{X}_j$	≥ 0	(12)
c)	$r_k MI - \sum_{j=1}^m k_{ij}^z X_j - \sum_{j=m+1}^n k_{ij}^z \hat{X}_j$	$= 0$	(2)
3. <u>Demand for Foreign Imports:</u>			
	$\sum_{i=1}^n k_i^M \bar{M}_i + k^M MI + \sum_{j=1}^m k_{ij}^D X_j + \sum_{j=m+1}^n k_{ij}^D \hat{X}_j$	$= k^E + k^R + k^F - k^{MC}$	(2)
4. <u>Import Substitution:</u>			
a)	$k_i^R I_i$	$\leq k_i^{QR} R$	(16)
b)	$\sum_{i=m+1}^n k_i^R I_i$	$\leq k^R R$	(2)
c)	$k_i^F I_i$	$\leq k_i^{Ar} R_k$	(16)
d)	$k_i^r I_i - (1+\theta_i) k_i^r I_i$	$= 0$	(16)
e)	$\sum_{i=m+1}^n (1+\theta_i) k_i^r I_i$	$\leq k^r R$	(2)

TABLE 5

Variable and Parameter Definitions
for the Sectoral Model

Variables

X_i	= output of sector i
I_i	= investment good output of sector i
R_i	= output from sector i for foreign trade-improving or import substitution
r_i	= output from sector i for regional trade-improving
C_i	= consumption of good i
E_i	= foreign traditional exports of good i
e_i	= regional traditional exports of good i
M_i	= competitive imports of good i
MI	= investment good imports
MC	= consumer good imports
m_i	= traditional regional imports
E	= total traditional exports
F	= net inflow of foreign aid

Parameters

a_{ij}	= input coefficient
b_{ij}	= capital coefficient for regular production
\hat{b}_{ij}	= capital coefficient for trade-improving production ($\hat{b}_{ij} > b_{ij}$)
z_j	= imported capital coefficient for regular production
\hat{z}_j	= imported capital coefficient for trade-improving production
p_j	= non-competitive import coefficient for regular production
\hat{p}_j	= non-competitive import coefficient for trade-improving production
ϕ_i	= upper bound on import substitution for foreign trade in sector i
λ	= upper bound on import substitution for regional trade in sector i
θ	= transport cost coefficient for regional trade of good i
τ	= terminal weights (stock-flow conversion factor) for investment

Subscripts

i, j	= sectors, where $i=1$ to $i=m$ are traditional output producing sectors and $i=m+1$ to $i=n$ are trade-improving output sectors ^{a/}
k, l	= regions, where $k=1, 2$ $l=1, 2$

^{a/} The symbol $\hat{}$ is used to indicate that the sectors referred to are trade-improving sectors.

capital resources are specified exogenously in line with the results from the "time-path" model. Equations (2b) and (2c) relate investment demand to output changes through a capital-coefficient matrix. The factor r , wherever it appears, is a necessary terminal condition for conversion of the flow of investment over the decade to capital stock.^{28/}

(3) Foreign Imports. This equation is again definitional. Total demand for foreign imports consists of competitive imports, investment goods imports, and noncompetitive imports of intermediate goods. Consumer goods imports are given exogenously. The balance of payments constraint is again derived from the "time-path" model.

(4) Import Substitution. The total amount of nontraditional production is set exogenously. The sectoral composition of such output is determined by the relative cost in terms of the scarce factors (capital and foreign exchange) required to produce various trade-improving commodities. In addition, it is necessary to place an upper bound on the trade-improving production produced by any one sector. Without such a restriction the linearity of the model would result in the choice of only one trade-improving sector.

^{28/} For a derivation of this condition, see Alan Manne, "Key Sectors of the Mexican Economy," The Theory and Design of Economic Development, eds. I. Adelman and E. Thorbecke. (Baltimore: Johns Hopkins University Press, 1966).

Equations (4c) and (4d) refer to regional nontraditional output which forms the physical counterpart of the inter-regional income transfers. Equation (4d) defines the imports of non-traditional, regionally traded commodities as the production of such a good in West Pakistan plus the transport cost associated with moving this good. Equation (4e) ensures that the sum of such exports is, if feasible, at least equal to the regional transfers called for by the "time-path" model.

The primary purpose of the sectoral model is to provide an indication of the optimal production structure in a static setting, given the constraints imposed by the "time-path" model. The objective function is taken as the maximization of regional product. This interpretation of the model comes, in reality, close to a feasibility or consistency test of the macro-economic values previously generated. The primary question to be addressed to this model can be formulated as follows: given the aggregate targets to be met for a specific regional policy and the regional allocation of resources, is such a set of final demands feasible given the production structure of the regional economies.

The Composition of Output and Structural Change.

Two solutions have been used to constrain the sectoral model. The first, the equal per capita income solution, represents the most orthodox interpretation of the regional objective, while the second, the equal growth rate solution, is taken as representative

of a realistic alternative to the present regional target. The composition of output under these two alternatives is given in Appendix Tables 6, 7, 8 and 9.

For East Pakistan the results of both solutions are broadly similar. This of course reflects the fact that in the macro-model East Pakistan's growth rate is always at the maximum permissible rate given its absorptive capacity. As investment continues to rise sharply in East Pakistan over the entire period, the highest sectoral growth rates are found for the investment goods sectors and those sectors closely related to creation of new capacity. The relatively low growth rates for the textile sectors are a result of the assumption that export demand for raw and manufactured jute is limited. Agricultural output increases at a rate slightly below that for regional product as a whole. Nevertheless, judged by the past performance of the agriculture sector in East Pakistan, this will still call for a substantial improvement in the agricultural performance.

It is in terms of the sectoral growth rates for West Pakistan revealed by the two solutions that bring into sharp focus the cost of adhering to the strict parity target. In the equal income solution, which posits a reduction in the regional growth rate for West Pakistan in the later period, the result is a sharp reduction in the growth rate for the investment goods sectors and such related sectors as metal products and nonmetallic minerals. In

TABLE 6

Structural Change in the Pakistan Economy

(Per cent)

<u>Sector</u>	<u>East Pakistan</u>				
	<u>1955^{a/}</u>	<u>1960^{a/}</u>	<u>1965^{a/}</u>	<u>1974^{b/}</u>	<u>1986^{b/}</u>
1. Agriculture	63.0	60.4	55.3	48.3	43.3
2. Manufacturing	4.7	6.	7.6	16.3	19.9
3. Others	<u>32.3</u>	<u>33.5</u>	<u>37.1</u>	<u>35.4</u>	<u>36.8</u>
Gross Regional Product	100.0%	100.0%	100.0%	100.0%	100.0%
<u>Sector</u>	<u>West Pakistan</u>				
	<u>1955^{a/}</u>	<u>1960^{a/}</u>	<u>1965^{a/}</u>	<u>1974^{b/}</u>	<u>1986^{b/}</u>
1. Agriculture	49.3	46.8	41.5	35.5	33.2
2. Manufacturing	11.1	12.3	15.1	26.3	29.2
3. Others	<u>39.6</u>	<u>40.9</u>	<u>43.4</u>	<u>38.2</u>	<u>37.6</u>
Gross Regional Product	100.0%	100.0%	100.0%	100.0%	100.0%
<u>Sector</u>	<u>Pakistan</u>				
	<u>1955^{a/}</u>	<u>1960^{a/}</u>	<u>1965^{a/}</u>	<u>1974^{b/}</u>	<u>1986^{b/}</u>
1. Agriculture	56.1	53.3	48.2	41.1	37.6
2. Manufacturing	8.0	9.3	11.5	21.9	25.1
3. Others	<u>35.9</u>	<u>37.4</u>	<u>40.3</u>	<u>37.0</u>	<u>37.3</u>
Gross National Product	100.0%	100.0%	100.0%	100.0%	100.0%

^{a/} T. M. Khan and A. Bergan, op. cit.^{b/} Based on equal growth rate solution.

addition, the effect of restraining growth in West Pakistan has a dramatic effect on the agriculture sector. By comparison, the sectoral output levels for the equal growth rate solution would indicate a fuller utilization of capacity in West Pakistan. In particular, in this solution agricultural output increases by 5.2 per cent in the early period and 6.0 per cent in the later period. While these growth rates are still below that forecast by the Planning Commission, they are admittedly high. Although few countries have sustained a growth rate for agricultural output as high as 6 per cent for any length of time, there is substantial optimism among agricultural economists familiar with the Pakistan situation that a dramatic increase in the agriculture growth rate in West Pakistan is likely. Consequently, adherence to a strict regional income parity policy would have the effect of foregoing the possible benefits which are expected to be forthcoming as a result of the past structural changes which have taken place in the rural economy of West Pakistan.

Table 6 brings out the structural changes implied by the equal growth rate solution. Both regional economies show a similar trend, i.e., a decline in the share of agriculture sector and an increase in the share of manufacturing in regional product. The implied change for East Pakistan is dramatic. The share of manufacturing nearly triples while the share of agriculture declines from over half of regional product to less than 44 per cent

by 1986. In part this rapid rise in the share of manufacturing reflects the relatively small base from which East Pakistan began in 1965. But to a considerable extent this rapid structure change is an inevitable result of the continued high rate of investment growth implied by the macro solution. For the economy as a whole, the expectation is that the structure of the economy will become fairly diversified by 1986, relying only for about one third of national product on the agriculture sector and having a substantial manufacturing base.

V. Regional Growth: The Policy Implications

The political pressures generated by the difference in regional per capita income levels and the past pattern of regional growth make it difficult to conceive of any long-run economic plan in Pakistan which can have meaning and national support if it does not clearly spell out the regional objectives. Yet rational policy-making should reflect a consideration of alternatives and their cost. The presently accepted policy of equating regional per capita incomes by the end of the Perspective Plan appears to be a target chosen on political grounds. Given the various pattern of regional growth and the alternative regional targets presented above, it becomes possible to evaluate more specifically the cost of the present objective and compare it to a number of alternatives.

One can identify two goals in Pakistan: to raise the level of well-being for the population as a whole by rapidly raising the growth rate of national product and to do so while ensuring an equitable distribution of total income. The first aim, in isolation, would maximize the growth of the national economy with little or no attention to regional welfare. Such an alternative, however, runs the severe risk of endangering national unity. Thus, while economically sound, the objective of maximizing only the national product of Pakistan must be rejected on political grounds.

At the other extreme lies the present target of equating regional incomes. The result is a low income level for both provinces, and in fact, when compared to other alternatives, it yields the lowest level of welfare. In some sense, however, this policy has fewer risks for East Pakistan. The attainment of an equal per capita income level in the two provinces calls for a minimal redistributational effort. Given the past alleged regional bias on the part of the central government, East Pakistan may well feel that any policy that looks toward an amelioration of regional income levels through an active redistribution policy is unrealistic. Thus East Pakistan's policy-makers may decide that any deviation from the present regional target, allowing for a more rapid rate of growth in West Pakistan, will only result in an increase in regional disparity. At the same time, it seems unlikely

that the present policy will be followed if, as the results of the analysis indicate, the implication is for a sharp reduction in the growth rate in West Pakistan. Not only can one question the possibility of actually implementing the necessary policies to frustrate the dynamism of this region, but again such an attempt also entails political risks.

A realistic assessment of alternatives clearly indicates the need to frame a regional policy that lies somewhere between these two extremes. One such solution is to equate regional growth rates, at least for the Perspective Plan period, and postpone any attempt to remove regional disparities to some time in the future.^{29/} Such an alternative not only increases welfare in both regions as compared to the strict parity solution but will have more appeal to aid-giving agencies. Regardless of which regional target is adopted, the economy will depend on foreign assistance for some time. Yet increasingly, donor countries have allocated foreign aid to recipients whose past performance indicated a high return on such assistance. If Pakistan is therefore to attract the required foreign aid, it must adopt a regional policy consistent with a high national growth rate. The substitution of a policy of equalizing regional growth rates for the

^{29/} Indeed, it seems likely that once growth is accelerated in both regions the demands for absolute parity in per capita income levels will become less incessant.

present policy of equating regional income levels would thus appear to be the most realistic alternative open to the government. Not only would it increase the welfare of both regions and utilize more fully capacity in West Pakistan, but it is likely to be the regional policy with greatest possibility of successful implementation.

Appendix Table 1

Definition of Variables and Parameters

Variables

V	= gross regional product.
V^0	= regular production.
V^1	= production for non-traditional trade.
I	= total gross investment.
I^0	= investment for regular production.
I^1	= investment for non-traditional production.
Y	= regional income.
R	= regional transfers.
S	= savings.
F	= foreign capital inflow.
M	= traditional imports, foreign trade ^a .
m	= traditional imports, regional trade ^a .
E	= traditional exports, foreign trade ^a .
e	= traditional exports, regional trade ^a .
C	= consumption.
N	= population.
K	= capital stock.
k_0	= capital-output ratio, regular production
k_1	= capital-output ratio, non-traditional production

a

Traditional imports and exports are those imports which would be imported and those exports which could be sold if the structure of the economy were to remain unchanged from the base year.

Appendix Table 2

Values of Variables and Parameters, 1965
(1965 prices)

		(Rs. Millions)	
<u>Variables^a</u>		<u>East Pakistan</u>	<u>West Pakistan</u>
1. Gross regional product	V_0	22,659	24,578
2. Saving	S_0	2,072	3,020
3. Investment	I_0	2,819	5,413
4. Imports (foreign)	M_0	1,922	4,240
5. Imports (regional)	m_0	965	550
6. Exports (foreign)	E_0	1,590	1,432
7. Net capital inflow	F_0	747	2,393
8. Consumption	C_0	20,587	21,558
9. Capital stock	K_0	56,648	73,734
10. Capital-output ratio: regular production	k_0	2.5	3.0
trade improving	k_1	4.0	4.0
11. Population (millions)		61.3	51.1
12. Income per capita (Rs.)		370	481
<u>Parameters</u>			
1. Marginal rate of savings	α	0.25	0.24
2. Rate of growth of exports:			
foreign	μ	4.0	5.8
regional	π	4.0	3.0
3. Marginal rate of imports:			
on income	η_0	0.20	0.25
on investment	η_1	0.40	0.30
4. Limit on investment increase	λ	0.10	0.10

Appendix Table 2 (Contd)

Values of Parameters, 1965
(1965 prices)

(Rs. Millions)

<u>Parameters</u>		<u>East Pakistan</u>	<u>West Pakistan</u>
5. Relative productivity of:			
"good" investment	β_1	1.00	1.00
"fair" investment	β_2	0.75	0.75
"poor" investment	β_3	0.50	0.50
6. Absorptive capacity limit	ϕ	0.11	0.13
7. Population increase: ^b			
1965-1970	ρ	3.2	2.9
1970-1975	ρ	2.9	2.7
1975-1980	ρ	3.0	2.8
1980-1985	ρ	3.0	2.8
1985-1990	ρ	2.8	2.7
8. Rate of discount	i	0.08	0.08
9. Rate of discount, post-plan	r	0.10	0.10
10. Cost of foreign exchange	γ	2.0	2.0
11. Relative valuation of post-plan consumption	δ	1.0	1.0
12. Post-plan growth rate	θ	7.3	7.1
13. Weight for terminal year income	σ	3.6	3.2
14. Terminal year of analysis	T	24	24
15. Terminal year for foreign aid	$T-n$	21	21
16. Terminal year for removal of disparity	$T-n$	21	21
17. Terminal year for regional transfers	T	24	24

^aTrend values derived from least squares regression fitted to actual data, 1960-1965.

^bJames W. Brackett and Donald S. Akers, Projections of the Population of Pakistan by Age and Sex: 1965-1985 (Washington, D.C. U.S. Department of Commerce, Bureau of the Census, Foreign Demographic Analysis Division, June 1965).

Parameters

- i = rate of discount
- γ = cost of foreign exchange
- σ = weight for terminal year income
- δ = weight on post-plan consumption
- α = marginal rate of savings
- θ = post-plan growth rate
- r = rate of discount on post-plan consumption
- u = exogenous rate of growth for foreign exports
- π = exogenous rate of growth for regional exports
- s_2 = relative productivity of "fair" (type 2) investment
- s_3 = relative productivity of "bad" (type 3) investment
- λ_1 = limit to increase of "good" (type 1) investment
- λ_2 = limit to increase of "fair" (type 2) investment
- λ_3 = limit to increase of "bad" (type 3) investment
- ϕ = absorptive capacity limit
- η_0 = marginal import rate on regional income
- η_1 = marginal import rate on regional investment
- ρ = rate of population increase

Subscripts

- t = time
- j, k = regions, where $j = 1, 2$; $k = 1, 2$.
- T = terminal year of analysis.

APPENDIX TABLE 3

Summary of Variables in the Basic Solution
(Billion Rupees)

East Pakistan^{b/}

<u>Plan Year</u>	<u>Income</u>	<u>Con- sumption</u>	<u>Invest- ment</u>	<u>Foreign Trade</u> ^{a/} <u>Exports Imports</u>	<u>Regional Trade</u> <u>Exports Imports</u>	<u>Savings</u>	<u>Capital Inflow</u>
1965	22.7	20.6	2.8	1.6 1.9	0.6 1.0	2.1	0.8
1968	25.3	22.8	3.9	1.8 2.8	0.6 1.1	2.5	1.5
1971	30.1	26.5	5.3	2.3 3.5	0.7 1.2	3.5	1.8
1974	34.9	30.3	7.2	2.8 5.0	0.8 1.3	4.7	2.6
1977	41.0	34.8	9.9	3.6 6.8	0.9 1.4	6.2	3.7
1980	48.6	40.3	13.5	4.5 9.3	1.0 1.5	8.2	5.3
1983	57.3	46.6	14.2	5.7 8.6	1.1 1.7	10.7	3.4
1986	71.3	59.0	14.2	7.2 8.5	1.3 1.8	12.2	1.9
1989	81.7	64.9	16.8	9.0 8.5	1.4 1.9	16.8	---

West Pakistan^{b/}

1965	24.6	21.6	5.4	1.4 4.2	1.0 0.6	3.0	2.4
1968	27.0	23.9	5.4	1.7 4.8	1.1 0.6	3.2	2.6
1971	30.8	27.5	5.4	2.5 5.1	1.2 0.7	3.3	2.1
1974	34.8	30.9	5.4	3.2 5.1	1.3 0.8	3.9	1.6
1977	39.7	34.7	6.1	4.0 5.1	1.4 0.9	5.0	1.1
1980	45.8	38.8	6.1	5.1 4.7	1.5 1.0	7.0	(-0.9)
1983	52.5	43.0	6.1	6.4 3.5	1.7 1.1	9.5	(-3.3)
1986	56.3	48.3	6.1	8.0 6.6	1.8 1.3	8.0	(-1.9)
1989	64.2	57.1	7.1	10.1 10.7	1.9 1.4	7.1	---

^{a/} Trade improving production was allocated to foreign exports until the growth rate of exports reached 7.9 per cent, the growth rate given in the Perspective Plan. The remainder was allocated to import substitution.

^{b/} Totals may not add up due to rounding.

APPENDIX TABLE 3 (Cont.)

Pakistan^{b/}

<u>Plan</u> <u>Year</u>	<u>Income</u>	<u>Con-</u> <u>sumption</u>	<u>Invest-</u> <u>ment</u>	<u>Foreign</u> <u>Exports</u>	<u>Trade</u> <u>Imports</u>	<u>Regional</u> <u>Exports</u>	<u>Trade</u> <u>Imports</u>	<u>Savings</u>	<u>Capital</u> <u>Inflow</u>
1965	47.3	42.2	8.2	3.0	6.1	---	---	5.1	3.2
1968	52.3	46.7	9.3	3.5	7.6	---	---	5.7	4.1
1971	60.9	54.0	10.7	4.8	8.6	---	---	6.8	3.9
1974	69.7	61.2	12.6	6.0	10.1	---	---	8.6	4.2
1977	80.7	69.5	16.0	7.6	12.4	---	---	11.2	4.8
1980	94.4	79.1	19.6	9.6	14.0	---	---	15.2	4.4
1983	109.8	89.6	20.3	12.1	12.1	---	---	20.3	0.03
1986	127.6	107.3	20.3	15.2	15.2	---	---	20.3	---
1989	145.9	122.0	23.9	19.1	19.1	---	---	23.9	---

East Pakistan

<u>Plan</u> <u>Year</u>	<u>Investment by Type</u>					<u>Capital Stock</u>			<u>Production</u>	
	<u>Regular</u>	<u>Trade</u> <u>Improving</u>	<u>"Good"</u>	<u>"Fair"</u>	<u>"Bad"</u>	<u>Regular</u>	<u>Trade</u> <u>Improving</u>	<u>Regular</u>	<u>Non-traditional</u> <u>Foreign</u>	<u>Regional</u>
1965	2.8	---	2.8	---	---	56.6	---	22.7	---	---
1968	3.2	0.7	1.3	1.3	1.3	62.9	---	25.3	---	---
1971	4.6	0.7	1.8	1.8	1.8	69.5	2.3	27.9	0.6	---
1974	6.1	1.1	2.4	2.4	2.4	79.4	4.3	31.8	1.1	---
1977	8.5	1.4	3.3	3.3	3.3	92.3	7.7	37.0	1.8	---
1980	8.5	5.0	4.5	4.5	4.5	119.4	11.8	44.3	3.0	---
1983	8.2	6.0	6.2	6.1	1.8	126.2	26.4	50.6	6.7	---
1986	8.0	6.2	8.2	5.9	---	148.0	39.8	58.9	10.5	---
1989	9.3	7.5	10.7	6.2	---	166.5	59.2	66.9	14.8	---

APPENDIX TABLE 3 (Cont.)

West Pakistan

<u>Plan Year</u>	<u>Investment by Type</u>					<u>Capital Stock</u>			<u>Production</u>	
	<u>Regular</u>	<u>Trade Improving</u>	<u>"Good"</u>	<u>"Fair"</u>	<u>"Bad"</u>	<u>Regular</u>	<u>Trade Improving</u>	<u>Regular</u>	<u>Non-traditional Foreign</u>	<u>Regional</u>
1965	5.4	---	5.4	---	---	73.7	---	24.6	---	---
1968	1.0	4.4	2.6	2.6	0.2	85.9	---	27.0	---	---
1971	3.2	2.3	3.7	1.7	---	88.8	11.8	29.4	1.4	1.5
1974	3.6	1.8	4.9	0.5	---	96.5	18.3	32.2	2.6	1.9
1977	3.5	2.6	6.1	---	---	107.0	23.7	35.7	4.0	1.9
1980	3.6	2.5	6.1	---	---	117.4	31.4	39.1	6.6	1.2
1983	4.7	1.4	6.1	---	---	128.2	38.8	42.7	9.7	---
1986	4.7	1.4	6.1	---	---	142.5	42.7	47.5	8.8	1.9
1989	5.8	1.4	7.1	---	---	160.6	42.7	53.5	10.7	---

Pakistan

1965	8.2	---	8.2	---	---	130.3	---	47.3	---	---
1968	4.2	5.1	3.9	3.9	1.5	148.8	---	52.3	---	---
1971	7.8	3.0	5.5	3.5	1.8	158.3	14.1	57.3	2.0	1.5
1974	9.7	2.9	7.3	3.9	2.4	175.9	22.6	64.0	3.7	1.9
1977	12.0	4.0	9.4	3.3	3.3	199.3	31.4	72.7	5.8	1.9
1980	12.1	7.5	10.6	4.5	4.5	227.8	43.2	83.4	9.6	1.2
1983	12.9	7.4	12.3	6.1	1.8	254.4	65.2	93.3	16.4	---
1986	12.7	7.6	14.3	5.9	---	290.5	82.5	106.4	19.3	1.9
1989	15.1	8.9	17.8	6.2	---	327.1	101.9	120.4	25.5	---

Shadow Prices in the Basic Solution

Investment Constraint

	"Good"	"Fair" East	"Bad"	"Good"	"Fair" West	"Bad"	Minimum Investment Growth Constraint
1	24.19	17.86	11.53	0.96	0.48	---	0.28
2	19.07	14.05	9.04	0.37	---	---	0.19
3	15.08	11.11	7.14	0.29	---	---	0.10
4	11.92	8.78	5.64	---	---	---	0.00
5	9.12	6.93	4.45	---	---	---	0.13
6	4.47	2.23	---	---	---	---	0.21
7	2.11	---	---	---	---	---	4.02
8	---	---	---	---	---	---	8.46

APPENDIX TABLE 4 (Cont.)

	<u>Disparity Constraints</u>		<u>Aid Termination Constraints</u>
	<u>Maximum Disparity</u>	<u>Removal of Disparity</u>	
1	278.46	----	----
2	192.87	----	----
3	138.81	----	----
4	89.05	----	----
5	43.70	----	----
6	----	----	----
7	----	23.06	7.47
8	----	920.57	2.14

APPENDIX TABLE 5

Summary of Solutions Using Alternative Targets, Policies, and Parameters

Solution	Characteristic of Solution	Terminal	Rate of Growth of Income		
		Year Income	East	West	Pakistan
I.	<u>Basic Parameters</u>	(Rs./Capita)	(Per cent)		
A-1	Equal per capita income ^{a/}	640	5.5	4.1	4.8
A-2	Equal per capita income	695	5.7	4.4	5.2
B-2	Equal per capita income; disparity widens first	700	5.9	4.5	5.4
C-1	Equal per capita income; regional transfers limited to 3% of income of West Pakistan	634	5.3	4.0	4.8
C-2	Equal per capita income; regional transfers limited to 3% of income of West Pakistan	678	5.6	4.4	5.1
D-	No regional income constraints	633 (East) 1208 (West)	5.4	7.4	6.8
E-1	Disparity reduced to 5%	640 (East)	5.5	4.3	5.1
E-2	Disparity reduced to 5%	703 (East)	6.0	4.7	5.3
F-1	Equal per capita growth rates	640 (East)	5.5	5.3	5.4
F-2	Equal per capita growth rates	740 (East)	6.2	5.9	6.0
II.	<u>Alternative Parameters</u>				
H-1	Absorptive Capacity East Pakistan 13%	730	6.1	4.7	5.4
I-1	Absorptive Capacity East Pakistan 16%	891	7.0	4.5	6.3
I-1a	Absorptive Capacity East Pakistan 16% Capital Output Ratio 3.75	684	5.6	4.4	5.1
J-1	Marginal rate of savings East Pakistan 18%	625	5.4	4.0	4.7
K-1	Marginal rate of savings West Pakistan 18%	620	5.3	3.9	4.6
L-1	Capital output ratio rises by 10%	614	5.3	3.9	4.6

APPENDIX TABLE 5 (Cont.)

<u>Solution</u>	<u>Consumption</u>	<u>Foreign Aid</u>		<u>Shadow Price</u>
	<u>Discounted</u> (Rs. Billions)	<u>Discounted</u> (Rs. Billions)	<u>Undiscounted</u> (Rs. Billions)	<u>Regional Target</u> (Rs. Billions)
<u>I. Basic Parameters</u>				
A-1 ^{a/}	731.63	34.6	64.0	326.65
A-2	776.83	44.7	61.7	67.57
B-2	780.62	57.8	115.7	141.77
C-1	729.47	53.6	112.4	310.29
C-2	774.51	54.3	109.6	281.20
D-	941.39	65.2	125.6	-
E-1	738.43	50.7	76.4	314.25
E-2	745.66	59.8	120.3	295.19
F-1	781.64	59.2	117.7	139.61
F-2	815.35	62.0	136.2	78.43
<u>II. Alternative Parameters</u>				
H-1	865.49	48.2	98.2	240.53
I-1	951.78	72.6	162.2	50.10
I-1a	745.82	61.9	132.4	361.72
J-1	768.87	49.6	96.7	330.46
K-1	760.29	44.5	86.7	124.16
L-1	625.81	42.2	84.0	339.26

^{a/} Numeral (1) refers to condition where regional transfers are terminated in terminal year while numeral (2) indicates an absence of this constraint.

APPENDIX TABLE 6

Composition of Regional Production

East Pakistan

(Based on equal income per capita solution)

<u>Sector</u>	<u>Production</u> (Billion Rupees)			<u>Rate of Growth</u> (Per cent)	
	<u>1965</u>	<u>1974</u>	<u>1986</u>	<u>1965-74</u>	<u>1974-86</u>
1. Agriculture	11.41	16.05	30.22	4.1%	5.4
2. Mining	0.08	0.13	0.35	5.5	8.6
3. Food processing	1.16	2.12 ^a	5.56 ^a	7.0	8.4
4. Cotton textiles	0.29	0.41 ^a	0.92 ^a	3.9	6.9
5. Jute textiles	0.40	0.49	0.65	2.3	2.4
6. Other textiles	0.14	0.23	0.49	5.6	6.5
7. Wood products	0.04	0.06	0.18	4.6	9.5
8. Paper products	0.15	0.26 ^a	0.87 ^a	6.3	10.5
9. Leather products	0.03	0.04	0.10	3.3	7.9
10. Rubber products	0.05	0.08 ^a	0.18 ^a	5.4	7.0
11. Fertilizer	0.02	0.07	0.27	14.9	11.9
12. Chemicals	0.13	0.24 ^a	1.26 ^a	7.0	14.8
13. Non-metallic minerals	0.16	0.36	0.96	9.4	8.5
14. Metals	0.20	0.38	0.95	7.4	8.0
15. Machinery	0.08	0.20	0.59	10.7	9.3
16. Transport equipment	0.14	0.26	0.65	7.2	7.9
17. Miscellaneous	0.23	0.25	0.30	1.0	1.5
18. Construction	1.11	2.00	4.55	6.7	7.1
19. Electricity	0.12	0.25	0.71	8.5	9.1
20. Transport services	1.22	2.03	4.29	5.8	6.4
21. Other services	5.44	7.33	15.05	3.4	6.1
Gross regional product	22.60	33.24	69.20	4.4%	6.3%

^aIncludes non-traditional output for foreign trade

APPENDIX TABLE 7

Composition of Regional Production

West Pakistan

(Based on equal income per capita solution)

<u>Sector</u>	<u>Production</u> (Billion Rupees)			<u>Rate of Growth</u> (Per cent)	
	<u>1965</u>	<u>1974</u>	<u>1986</u>	<u>1965-74</u>	<u>1974-86</u>
1. Agriculture	9.54	13.36 ^b	19.13	4.0%	3.1%
2. Mining	0.20	0.41	0.82	8.1	5.7
3. Food processing	1.58	2.84 ^{a,b}	4.90 ^{a,b}	7.1	4.4
4. Cotton textiles	1.12	2.08 ^{a,b}	2.99 ^a	7.1	3.1
5. Jute textiles	-	-	-	-	-
6. Other textiles	0.18	0.39	0.62	8.9	4.0
7. Wood products	0.03	0.05	0.09	5.8	5.0
8. Paper products	0.09	0.16	0.31	6.6	5.7
9. Leather products	0.11	0.20	0.27	6.9	2.6
10. Rubber products	0.07	0.21 ^{a,b}	0.43 ^{a,b}	13.0	6.1
11. Fertilizer	0.04	0.11	0.29	11.9	8.4
12. Chemicals	0.43	1.17 ^{a,b}	2.72 ^{a,b}	12.8	7.3
13. Non-metallic minerals	0.10	0.31	0.79	13.4	8.1
14. Metals	0.36	1.06	2.54 ^b	12.8	7.6
15. Machinery	0.32	0.77	2.02 ^b	10.2	8.4
16. Transport equipment	0.30	0.49	0.89	5.6	5.1
17. Miscellaneous	0.22	0.49 ^a	0.81 ^a	9.3	4.3
18. Construction	1.38	2.19	3.46	5.3	3.9
19. Electricity	0.22	0.54	1.19	10.4	6.8
20. Transportation	1.26	1.74	2.65	3.7	3.5
21. Other services	7.03	9.13	12.08	3.1	2.1
Gross Regional Product	24.58	37.70	59.00	5.0%	3.7%

^aIncludes non-traditional output for foreign trade

^bIncludes non-traditional output for regional trade

Appendix TABLE 8

Composition of Regional Production
East Pakistan

(Based on equal regional growth rate solution)

Sector	Production (billions rupees)			Rate of Growth (per cent)	
	1955	1974	1986	1965-74	1974-86
1. Agriculture	11.41	16.05	30.02	4.1 %	5.3 %
2. Mining	0.08	0.13	0.36	5.5	8.6
3. Food processing	1.16	2.13 ^a	4.17 ^a	7.1	5.8
4. Cotton textiles	0.29	0.57 ^a	1.15 ^a	7.1	6.5
5. Jute textiles	0.40	0.51	0.84	2.8	4.3
6. Other textiles	0.14	0.25	0.65	6.7	8.3
7. Wood Products	0.04	0.05	0.19	4.6	10.1
8. Paper products	0.15	0.28 ^a	0.90 ^a	7.2	10.2
9. Leather products	0.03	0.04	0.09	3.3	7.0
10. Rubber products	0.05	0.07 ^a	0.16 ^a	3.8	6.9
11. Fertilizer	0.02	0.07	0.37	14.9	12.9
12. Chemicals	0.13	0.26 ^a	1.37 ^a	8.0	14.8
13. Non-metallic minerals	0.16	0.37	1.05	9.8	9.1
14. Metals	0.20	0.34	0.90	6.1	8.5
15. Machinery	0.08	0.19	0.60	8.7	11.5
16. Transport equipment	0.14	0.25	0.77	6.6	10.7
17. Miscellaneous	0.23	0.26	0.45	1.2	4.7
18. Construction	1.11	2.03	4.87	7.0	7.5
19. Electricity	0.12	0.24	0.73	8.5	9.7
20. Transport services	1.22	2.04	4.37	5.9	6.6
21. Other services	5.44	7.35	15.34	3.4	6.3
Gross Regional Product	22.60	33.26	69.24	4.4 %	6.3 %

^aIncludes non-traditional output for foreign trade.

APPENDIX TABLE 9

Composition of Regional Production

West Pakistan

(Based on equal regional growth rate solution)

<u>Sector</u>	<u>Production</u> (Billion Rupees)			<u>Rate of Growth</u> (Per cent)	
	<u>1965</u>	<u>1974</u>	<u>1986</u>	<u>1965-1974</u>	<u>1974-1986</u>
1. Agriculture	9.54	15.05 ^b	30.31	5.2%	6.0
2. Mining	0.20	0.42	1.03	8.6	7.9
3. Food processing	1.58	3.01 ^{a,b}	7.04 ^{a,b}	7.4	7.3
4. Cotton textiles	1.12	2.27 ^{a,b}	4.36 ^{a,b}	8.2	5.6
5. Jute textiles	-	-	-	-	-
6. Other textiles	0.18	0.42	0.92	9.9	6.8
7. Wood products	0.03	0.06	0.14	8.0	7.3
8. Paper products	0.09	0.19	0.43	8.7	7.1
9. Leather products	0.11	0.22	0.47	9.9	6.5
10. Rubber products	0.07	0.23 ^{a,b}	0.61 ^b	14.1	8.5
11. Fertilizer	0.04	0.13	0.38	14.0	9.5
12. Chemicals	0.43	1.28 ^{a,b}	3.03 ^{a,b}	12.9	7.4
13. Non-metallic minerals	0.10	0.38	1.05	16.0	8.9
14. Metals	0.36	1.15 ^{a,b}	2.88 ^{a,b}	13.7	7.9
15. Machinery	0.32	0.89 ^a	2.49 ^{a,b}	12.0	9.0
16. Transport equip-	0.30	0.69	1.59	9.7	7.2
17. Miscellaneous	0.22	0.55 ^a	1.33 ^a	10.7	7.6
18. Construction	1.38	2.98	6.88	8.9	7.3
19. Electricity	0.22	0.71	1.89	13.9	8.5
20. Transportation	1.26	2.04	5.01	5.5	7.7
21. Other services	7.03	10.03	19.50	4.1	5.7
Gross Regional Product	24.58	42.41	91.34	6.3%	6.6%

^aIncludes non-traditional output for foreign trade

^bIncludes non-traditional output for regional trade

