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GROWTH, DEVELOPMENT
AND REGIONAL EQUITY
IN PAKISTAN

by

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Growth, Development and Regional
Equity in Pakistan

The existence and stubborn persistence of regional income differences at various stages of economic development has long been recognized as a peculiar facet of the process of economic growth. It would clearly be presumptuous to expect the process of economic growth to appear with equal force in all regions of a national state at the same time. There are bound to be particular places within a country where wealth can grow most easily. Such areas may have a particular geographic advantage, a proximity to minerals or sources of power, naturally good communications, or be particularly suited for a special crop [12; p. 184/ [11; p. 163/.

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While it is relatively simple to posit a variety of possible causes leading to spatial income inequalities it is more difficult to explain their persistence. Presumably the economic interdependence among regional units within a state can be expected to be much stronger than between nations. Thus internal factor mobility should tend to eliminate inter-regional income differences unless transport costs are forbidding. But depressed areas and backward regions continue to persist. This suggests that internal factor flows do not occur with sufficient rapidity to offset the dynamic conditions which further increase spatial inequalities. It appears that in some cases unequal rates of growth perpetuate themselves as investors become attracted to the dynamic region in the expectation of exploiting its potential external economies. It is difficult to be sure whether such externalities do indeed exist or whether investors are attracted by the aura of success that surrounds the growing region. The result is that in some situations investors seem to spend a long time mopping up the opportunities around some "growth pole", neglecting those that may have arisen, or could be made to arise, elsewhere.

While the problem of regional income inequalities is not limited to developing countries, it is in the context of development that it can have particularly severe repercussions. The development process often engenders political tensions between various groups. If economic differences between regions are also present and if they reinforce geographic, social, and linguistic differences, a growing disparity in regional welfare may cause a severe strain on the nation's political framework. A government program to ameliorate regional differences usually will entail an effort to change

past patterns of resource flows in an attempt to increase the share of total investment in the lagging region. A more active policy may encompass outright income transfer payments to the inhabitants of the backward region.^{1/}

Regardless of the form of regional policy, the need to take the regional dimension into account adds an additional difficulty to the already complex problem of achieving rapid growth for the nation as a whole. A shift in investment resources from one region to another may well lead to a lower rate of growth of national income if the lagging region is indeed characterized by a set of less favorable economic conditions.^{2/}

Two obstacles usually restrict the scope of regional analysis. The first relates to the problem of defining the physical boundaries of an economically meaningful area to be chosen for analysis. Ideally, the region to be studied should be a geographic entity for which clear policies and objectives have been enunciated. The second problem is that the analyst is usually faced with a lack of data relating to such an "economic

^{1/} Among the better known post-war regional development programs are those for Southern Italy and Northeast Brazil. For an analysis of the Italian situation see [7] and [3]. The Brazilian case is discussed in [1] and [22]. Additional references to regional planning and programs can be found in the extensive bibliography in [14].

^{2/} A possible, but certainly less interesting case, where the dynamic region has grown solely because of favoritism on the part of the government, is ruled out. In such a situation the proper allocation of resources would not only ameliorate the regional problem but lead to a maximization of the potential national growth rate as well.

development region." ^{3/} In practice therefore the area studied is often restricted by the availability of relevant economic data. In this respect Pakistan, divided into two non-contiguous regions, East and West Pakistan, provides an unusual opportunity. The regions are clearly defined and can readily be identified as "lagging" and "dynamic." ^{4/} They also represent areas for which specific development policies and objectives exist. At the same time data on the economic performance of the two provinces are available. While a number of conceptual problems in allocating production by regions remain to be resolved and while the regional data are likely to be even less reliable than the national accounts for all Pakistan [18], the existing data do provide a basis from an analysis of the regional problem can begin.

^{3/} The term "economic development region" was apparently first used by Joseph Fischer. See [8; pp. W1 - W20]

^{4/} This does not imply that there is economic homogeneity within each province. Indeed it is likely that the intra-provincial differences in economic welfare are greater than the inter-provincial differences. Nevertheless, as a generalization which has considerable political importance, the identification of East Pakistan as the "lagging" and West Pakistan as the "dynamic" region has validity.

The remainder of the paper is divided as follows. First the background to the regional problem in Pakistan is presented. Then attention is focused on the long-term growth of the national and regional economies 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.

II. Growth and Structural Change in the Regional Economics, 1950-1965.

Past economic growth in Pakistan can be divided into two relatively distinct phases. The first covers the period 1950 to 1960, or perhaps 1959, and was one of relative stagnation.^{5/} Since 1960 the economy has shown remarkable improvement in its development performance.

For the decade 1950 to 1960, gross national product in constant prices, was estimated to have grown at 2.6 per cent per annum, a rate just equal to the estimated growth of population. Over the period 1960 to 1965, national product, again at constant prices, has increased by over 5.4 per cent per annum and per capita incomes have grown by 2.8 per cent a year. Investment, as a per cent of GNP, had increased from 9.7 per cent in 1960 to 17.3 per cent in 1965 and the savings proportion rose from 6.5 per cent

^{5/} Although Pakistan became independent in 1947, the statistical data for the first years are admitted to be unreliable since they tend to be heavily influenced by transient factors relating to the upheavals following partition. Consequently they have been omitted from the analysis. It should also be noted that data in Pakistan cover July-to-June fiscal years. For convenience reference is made to calendar years rather than to the more

to 10.5 per cent over the same period $\overline{13}$ $\overline{16}$. Thus, whereas at the start of Pakistan's first Five-Year Plan the country was in the lower quartile of developing countries with respect to its investment, savings, and growth rate, by the end of the second Five-Year Plan it had moved to the upper quartile $\overline{4}$.

The Regional Economies: Their Structure and Growth.

Growth and structural change in two regions has been far from uniform. The composition of production in East and West Pakistan is shown in Tables 1a and 1b. The agriculture sector continues to dominate both regional economies but the share of agriculture in the gross regional product of West Pakistan has been declining rapidly. It is the share of manufacturing in the regional economies, and its rate of growth, 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 continues to be, poor in comparison to that found in West Pakistan. Land cost is also higher in East Pakistan and the physical presence of the central government in West Pakistan undoubtedly played a considerable role $\overline{19}$ $\overline{21}$. While 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 consequence of this regional bias in industrial location, such related sectors as banking and insurance have also favored West Pakistan, probably to an even greater extent than is reflected in the data in Tables 1a and b, where the allocation of such service to regions has been done, in line with

Table 1.a

<u>Sectors</u>	<u>Gross Provincial Product</u>								(1960 Factor Cost) (Rs. Millions)
	<u>1950</u>		<u>1955</u>		<u>1960</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>	
1. Agriculture	8,074	6,595	8,704	6,948	9,042	7,711	11,020	8,741	
2. Mining	-	27	-	45	-	70	8	123	
3. Manufacturing	472	961	651	1,569	912	2,018	1,532	3,179	
4. Construction	58	179	126	289	224	427	900	1,021	
5. Transport and communications	631	608	779	810	900	921	1,218	1,206	
6. All others	<u>3,139</u>	<u>3,721</u>	<u>3,556</u>	<u>4,445</u>	<u>3,894</u>	<u>5,320</u>	<u>5,242</u>	<u>6,797</u>	
7. Gross Provincial Product	12,374	12,091	13,816	14,106	14,972	16,467	19,920	21,067	
8. Population (Millions) (Millions)	42.25	35.31	47.70	39.87	53.58	45.03	61.30	51.10	
9. Gross Regional Product Per Ca- pita (Rs.)	293	342	290	354	278	366	325	412	
Sources: <u>1950 - 1960:</u>	<u>13</u>								
<u>1965</u>	: <u>9</u> <u>16</u>								

Table 1.b

Percentage Distribution of Gross Provincial Product

Sectors <u>Sectors</u>	1950		1955		1960		1965	
	<u>East</u>	<u>West</u>	<u>East</u>	<u>West</u>	<u>East</u>	<u>West</u>	<u>East</u>	<u>West</u>
1. Agricultural	65.2%	54.5%	63.0%	49.3%	60.4%	46.8%	55.3%	41.5%
2. Mining	--	0.2	--	0.3	--	0.4	--	0.6
3. Manufacturing	3.8	7.9	4.7	11.1	6.1	12.3	7.6	15.1
4. Construction	0.5	1.5	5.6	5.7	6.0	5.6	6.1	5.7
5. Transport and communications	5.1	5.0	5.6	5.7	6.0	5.6	6.1	5.7
6. All others	25.4	30.9	25.8	31.6	26.0	32.3	26.5	32.3
7. Gross Regional Product	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

official Government of Pakistan procedure, on a 50:50 basis.

The pattern of sectorial growth within each region again reveals two distinct time periods. From 1950 to 1960 both regional economies were relatively stagnant, although the growth rate in East Pakistan was significantly lower in nearly all sectors than in West Pakistan. Since 1960 both regions have experienced a higher rate of growth in nearly all sectors, but more significantly, East Pakistan's economy appears to have achieved a growth rate which has apparently halted the widening in the regional per capita product differences.^{6/}

The effect of this growth pattern on regional per capita product is shown in Figure 1. While there was a disparity in per capita product in 1950, the disparity between the two regions widened till 1960. With 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 per cent in 1965. While evidence of a reversal of the widening disparity trend is weak, note should also be taken of the more regular time path in West Pakistan's growth of

^{6/} Given the weaknesses and incompleteness of the series underlying these regional accounts, it is unfortunately impossible to reach an entirely objective conclusion on either the level of disparity or its movement over time. The present paper confines itself to official estimates up to 1965, which, for political reasons perhaps tend to underestimate regional differences. A less optimistic analysis of regional growth, and perhaps a more realistic one, can be found in [18; pp. 316-322]. Recent evidence also seems to indicate a further widening in the disparity level but it is not clear as yet whether this represents a short run phenomenon or a return to the pattern of growth that marked the period before 1960.

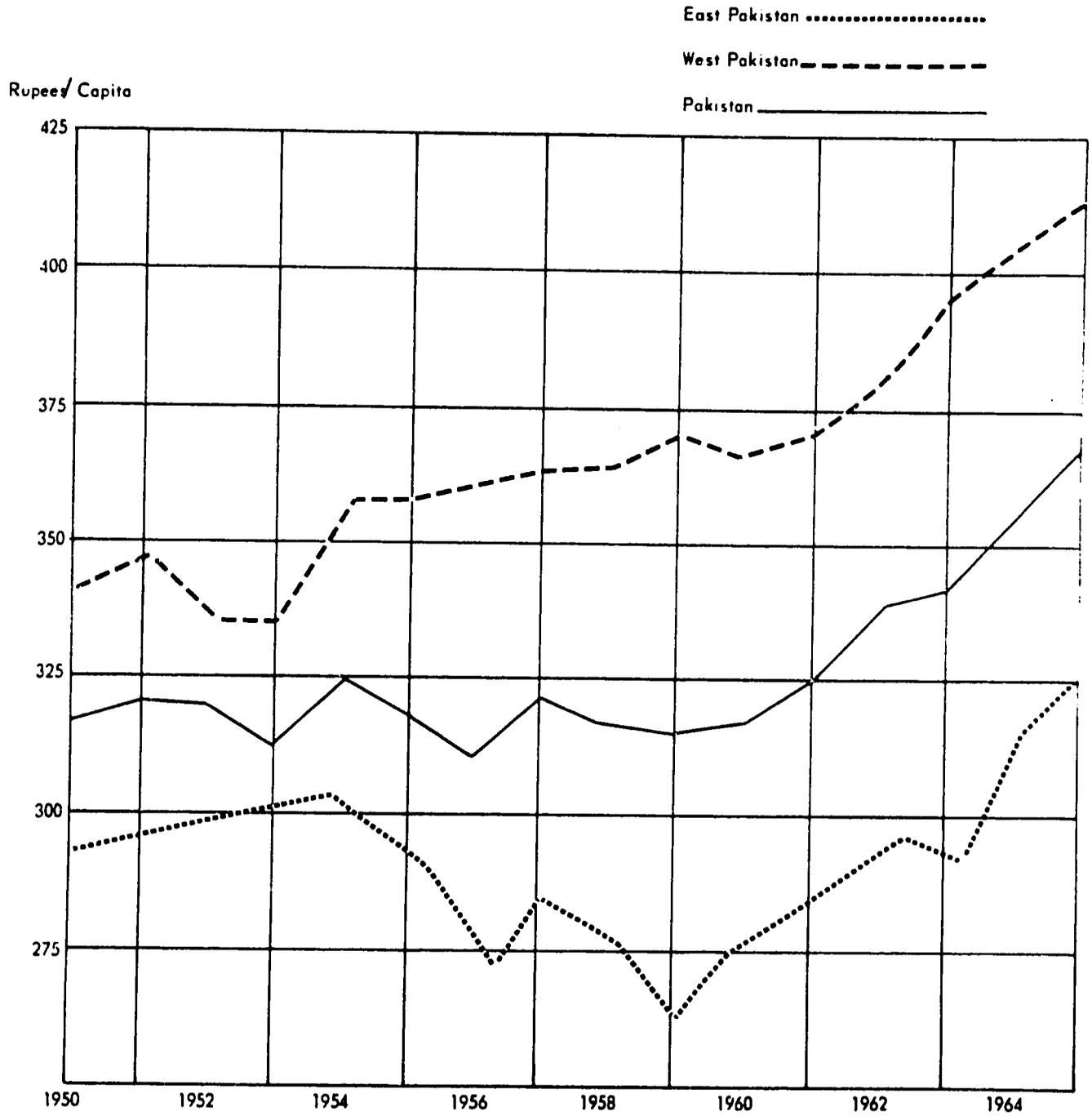
per capita product since 1960 as opposed to that found in East Pakistan. This reflects the more diversified structure of West Pakistan's economy. By contrast weather still has a crucial effect on the level of agricultural output and hence on the growth of regional product in East Pakistan. This is brought out by the sharp drop in the per capita product in East Pakistan for 1963 when agricultural output declined sharply.

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 between the two provinces. Exports from East Pakistan have earned the bulk of Pakistan's foreign exchange over the period 1950 to 1965. At the same time the major share of foreign imports were destined for West Pakistan. In terms of regional commodity trade, East Pakistan has had a continued deficit on its current account, which till 1957, was less than its surplus on its foreign trade account, thus implying a net transfer of resources to West Pakistan [21]. Haq [10] estimates that such transfers amounted to Rs. 210 million per year over the period 1950 to 1955 and perhaps Rs. 100 million a year from 1956 to 1960.

The mechanism for effecting such transfers was the combined operation of the exchange control and import licensing systems. Since exporters must surrender foreign exchange earned to the central government, and as foreign exchange thus collected is licensed to importers in line with government policy, the volume of imports from abroad into each region can be effectively controlled. Over time one might expect that the regional surplus on its foreign trade balance would be offset by a deficit on its regional trade account.

FIGURE 1
PER CAPITA PRODUCT
(Constant 1960 prices)



Exporters are paid in domestic currency, which, if it cannot be used to buy foreign merchandise, would create an inflationary pressure eventually resulting in a flow of goods from the lower price region to the higher. That this mechanism has apparently not worked reflects the fact that shipping space for inter-regional trade has been limited and that domestic currency transfers are unrestricted.

The precise measurement of such resource transfers is difficult, if not impossible, because of definitional questions and a lack of data relating to invisible trade and capital movements. Nevertheless, the total regional surplus on the commodity trade account, shown for East Pakistan in Table 2a and b, was, certainly for the early period, of such a magnitude that even the inclusion of non-commodity trade probably would not alter the conclusion that, on balance, a transfer of resources had taken place. Since the net inflow of foreign aid must equal a region's balance of payment deficit on its foreign and regional account, assuming no change in foreign exchange reserves, the data in Table 2 would tend to lend some support to the contention that West Pakistan has been the major recipient of foreign aid, even if one were to make a generous allowance for the effect of omitting invisible trade.

The Regional Economies: Investment and Savings.

The caveats previously applied to the regional product accounts must be repeated when one turns to the comparison savings and investment, shown in Table 3. Despite the shortcomings of the available investment series they all reveal a remarkable constancy in East Pakistan's share of total investment $\bar{10}$ / $\bar{16}$. This constancy in the regional shares of investment, despite the government's stated desire to increase the allocation of investment resources to East Pakistan, has generally been explained by a lack of

Table 2.a

Foreign and Regional Commodity Trade Balances

EAST PAKISTAN

(Rs. Million/Current Prices)

Year	<u>Foreign Account</u>			<u>Regional Account</u>			<u>Total Trade Balance</u>
	<u>Exports</u>	<u>Imports</u>	Surplus <u>Deficit(-)</u>	<u>Exports</u>	<u>Imports</u>	<u>Deficit</u>	Surplus <u>Deficit(-)</u> <u>Total</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	654	311	334	131	370	-239	95
1955	732	332	400	181	293	-112	288
1956	1,041	376	665	221	319	-98	567
1957q	909	841	68	325	510	-185	-117
1958	988	748	240	264	690	-426	-186
1959	881	579	302	278	660	-382	-80
1960	1,030	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

Source: [15]

TABLE 2b

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>Trade Balance</u> <u>Surplus</u> <u>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

"absorptive capacity" in that province. While the factors assumed to have caused this "absorptive capacity" constraint were not specified it has usually been taken to mean a lack of technically skilled persons needed to efficiently implement new projects and an inability to utilize resources effectively because of inadequate infra-structure. The government presumably was unable to redress this past pattern.

Though the concept of "absorptive capacity" is difficult to quantify it is true that East Pakistan's development effort has at times been plagued with an inability to prepare a substantial "shelf of projects" to which aid donors could subscribe. Admitting that some bottlenecks on the absorption of investment exist in no way removes the possibility that non-economic factors played a role in the allocative decision-making process. The fact that the central government is physically located in West Pakistan and largely staffed by West Pakistanis undoubtedly had some effect [21]. Regardless however what emphasis is placed on the possible economic and political factors it seems clear that the failure to substantially increase the share of investment in East Pakistan must be counted as a major element in the inability to bring about any significant reduction in the level of disparity. The possibility that East Pakistan's economy is characterized by a lower absorptive capacity cannot be dismissed. As this assumption is of some importance in our results it will be discussed more fully in Section II.

Despite the caution with which one must interpret the data on savings it appears from Table 3 that the average savings rate in East Pakistan is

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>
1. Gross Regional Product ^{a/} (factor cost)	16,937	17,849	17,994	18,488	18,970	19,672	20,392	21,123	22,510	23,170
2. Indirect taxes - subsidies ^{b/}	<u>394</u>	<u>1,054</u>	<u>439</u>	<u>1,169</u>	<u>452</u>	<u>1,303</u>	<u>491</u>	<u>1,569</u>	<u>635</u>	<u>1,976</u>
3. Gross Regional Product (market prices)	17,331	18,903	18,433	19,657	19,422	20,975	20,883	22,692	23,145	25,146
4. Gross ^{a/} Regional Invest- ment ^{a/}	1,355	3,205	1,963	3,837	1,818	4,433	2,420	4,790	2,929	5,401
5. Surplus (+)/Deficit(-) ^{c/} total current account ^{c/}	<u>-246</u>	<u>-1,227</u>	<u>-117</u>	<u>-135</u>	<u>-363</u>	<u>-1,592</u>	<u>-674</u>	<u>-2,023</u>	<u>-753</u>	<u>-2,500</u>
6. Gross Regional Savings	1,109	1,978	1,846	2,486	1,455	2,840	1,746	2,767	2,176	2,901
7. Investment as a % of GNP	7.8%	17.0%	10.6%	19.5%	9.4%	21.1%	12.0%	21.1%	12.7%	21.5%
8. Savings as a % of GRP	6.4%	10.5%	10.0%	12.6%	7.5%	14.1%	8.4%	12.2%	9.4%	11.5%
9. % of investment financed by own savings	81.8%	61.7%	94.0%	64.8%	80.0%	64.1%	72.1%	57.8%	74.2%	53.7%

Sources: ^{a/} [16]

^{b/} [24]

^{c/} Calculated from data in Table 2 and [23].

lower, and more variable, than in West Pakistan. At the same time the marginal savings rate over the Second Five-year Plan period (1960-1965) was 18 per cent in East Pakistan and approximately 15 per cent in West Pakistan. There is no a priori reason to assume a more frugal population in one or the other region. Government policy can have a considerable impact on the savings rate. Hence for the purpose of analysis the marginal savings rate are taken to be nearly equal for both regions and close to the marginal savings rate projected over the Perspective Plan [17].

Long Term Objectives for Pakistan

The official national accounts data, in 1965 prices, indicate a 20 per cent difference in the regional per capita product.^{7/} Such a difference in the per capita product figures is, by comparison to that found elsewhere, not very great. Using an index for measuring regional income dispersions developed by Williamson [28], Pakistan's regional problem appears insignificant compared to that found in other countries. This is especially so if the comparison is limited to low income countries.^{8/} Nevertheless the regional problem as found in Pakistan is highly unusual. In no other country are the two regions noncontiguous, thus posing enormous obstacles to the mobility of capital and labor. And the fact remains that regional disparities, of whatever level, are more tolerable when the

^{7/}The official national accounts of Pakistan do not provide for separate estimates of national or regional incomes. Since regional incomes can divert from regional factor incomes if inter-regional income transfer payments are present the lack of a properly defined income series for each region has led to the implicit assumption that regional product and income are equal.

^{8/}One reason for the low value found for the inter-regional income index in Pakistan is due to the fact that use of only two regions tends to mask the possible presence of greater intra-provincial income differences.

poorer region can at least enjoy the minimum necessities of life. In Pakistan, even the relatively "affluent" region lives close to a subsistence level. The disparity in regional income and welfare is thus particularly painful.

As a consequence of the political pressures generated by the disparity in regional welfare the removal of all differences in regional per capita incomes has been made a constitutional obligation. More recently, the Planning Commission has proposed that this target be achieved by 1985, the end of the Perspective Plan period [17]. At the same time dependence on foreign aid is to be terminated and per capita income is to be doubled. The setting of these objectives has been done with little analysis that would bring to light alternative growth patterns and the cost of meeting a strict regional income equality target. The objective of the present analysis is aimed primarily at highlighting the regional growth problem and bringing to the fore the possible effects such a regional target may have on the pattern of national development.

III. Regional Growth: The Macro- Economic Implications

It is generally agreed that considerable insight into the development process is gained if it is analyzed both in terms of its dynamic relationships and its related structural change. Nevertheless the usual specification of planning models concentrate either on the problem of planning over time or, at the other extreme, emphasize sectorial analysis in a static setting.

This is the result of the computational difficulties inherent in solving multi-sectorial, inter-temporal models. If a regional dimension is also added the problem becomes even more complex.

Neither the dynamic nor the sectorial aspect of the development process can be omitted without a considerable loss of information. The sectors of the economy should not be aggregated to such a degree that any technological differences in the production structures among sectors and regions is lost. Similarly, the disaggregation over time should leave scope for a gradual transition from one phase of the development process to the next rather than force abrupt changes such as it would occur if the dynamic aspects of the problem were limited.

It is clearly necessary to simplify the problem even if it is not easy to decide what aspects of the analysis can be omitted with a minimal loss of information. One possible solution is to break the problem of planning over regions, time, and sectors into steps or stages each of which is solved in succession [25]. Specifically it seems appropriate to deal first with the problem of distributing production and income over time without regard to the composition of such output or expenditure. As a second stage the question of composition and structure can be analyzed. This means that first a macro problem is posited in which the changing relationships of the macro variables over time are given full attention while at a later stage a micro problem, embodying the information previously obtained, is solved. Although such an approach has the obvious advantage of allowing considerable scope for the analyzes of both the dynamic and sectorial aspects of regional growth this method does have some limitations which are briefly discussed in Section IV.

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 adaption of the analytic framework developed by Chenery and MacEwan [6] and Chenery and Dorfman [5]. As the assumptions underlying the formulation of this model have been extensively described in the articles cited, the description which follows will be brief.

The primary 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 specified, 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 resultant shift in production from the "traditional" sector to the "trade improving" sector causes a rise in the economy-wide capital-output ratio reflecting the operation of the principle of comparative advantage. Only two scarce factors are considered - foreign exchange and capital. Any possibility of regional migration is omitted since the distance and cost involved in inter-regional migration, and the regional differences in language and social customs, make it unlikely that population movements will be a major factor in Pakistan.

Specifically the following function is to be maximized:

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

where:

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

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-Perspective Plan years; and (iii) the discounted value of foreign aid with a weight γ representing the price of foreign assistance.^{9/} The definitions of all variables and parameters are given in Appendix Tables 1 and 2.

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 earnings are used in the producing region ($V_{t,j,j}^1$) and that portion that forms the physical counter-part of inter-regional transfer payments ($V_{t,j,j}^1$)

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

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 gross regional product plus (minus) net regional transfer payments.

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

where such transfers are given by:

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

Regional expenditure is defined as:

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

^{9/} For a more complete discussion of this particular welfare function, see [6]

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 destined 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.

$$\begin{aligned} E_{t,j} &= E_{0,j} (1 + \mu_j)^t \\ e_{t,j} &= e_{0,j} (1 + \pi_j)^t \end{aligned} \quad (8a)$$

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

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

and the sum of the capital inflows into each region is equal to the foreign aid received by the nation as a whole:

$$F_t = \sum_{j=1}^J F_{t,j} \quad (8c)$$

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:

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

and that for trade-improving production and transfers by:

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

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 redefinition of investment.

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

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 regional economies move downward on the marginal productivity of investment curve.

The exogenously specified limits on the regional economy's ability to absorb investment are introduced by adding a factor (φ_j) to the investment constraint and a factor (λ) which indicates that one-third of total investment may take place on each step of the marginal productivity curve.

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

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

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

Demand for imports is a function of base-year imports and changes in regional production and investment:

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

While it is possible to incorporate most policy targets into the welfare function if the price associated with such a target were known a priori, it is in general easier to define certain additional policy targets as constraints to the model. Two objectives of the Pakistan Perspective Plan are introduced explicitly. Foreign aid is to be terminated at some specified year and regional per capita incomes must be equalized by 1985 so that regional parity must be maintained in the future. Thus,

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

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 unrealistic declines in per capita consumption and investment are ruled out.

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

and

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

Similarly declines in per capita regional income is considered an untenable

possible alternative to solving the income disparity problem. Thus,

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

Alternative Forms of the Model.

Although a specific regional target is defined in the Pakistan Perspective Plan, three alternative patterns for regional growth can be specified. One possibility is to rule out any widening of the regional disparity over the level found in the base-year.

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

Furthermore, it may, for political reasons, be necessary to restrict the permissible level of income transfer payment and eventually to terminate such payments after regional income differences have been eliminated. The first condition is given by:

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

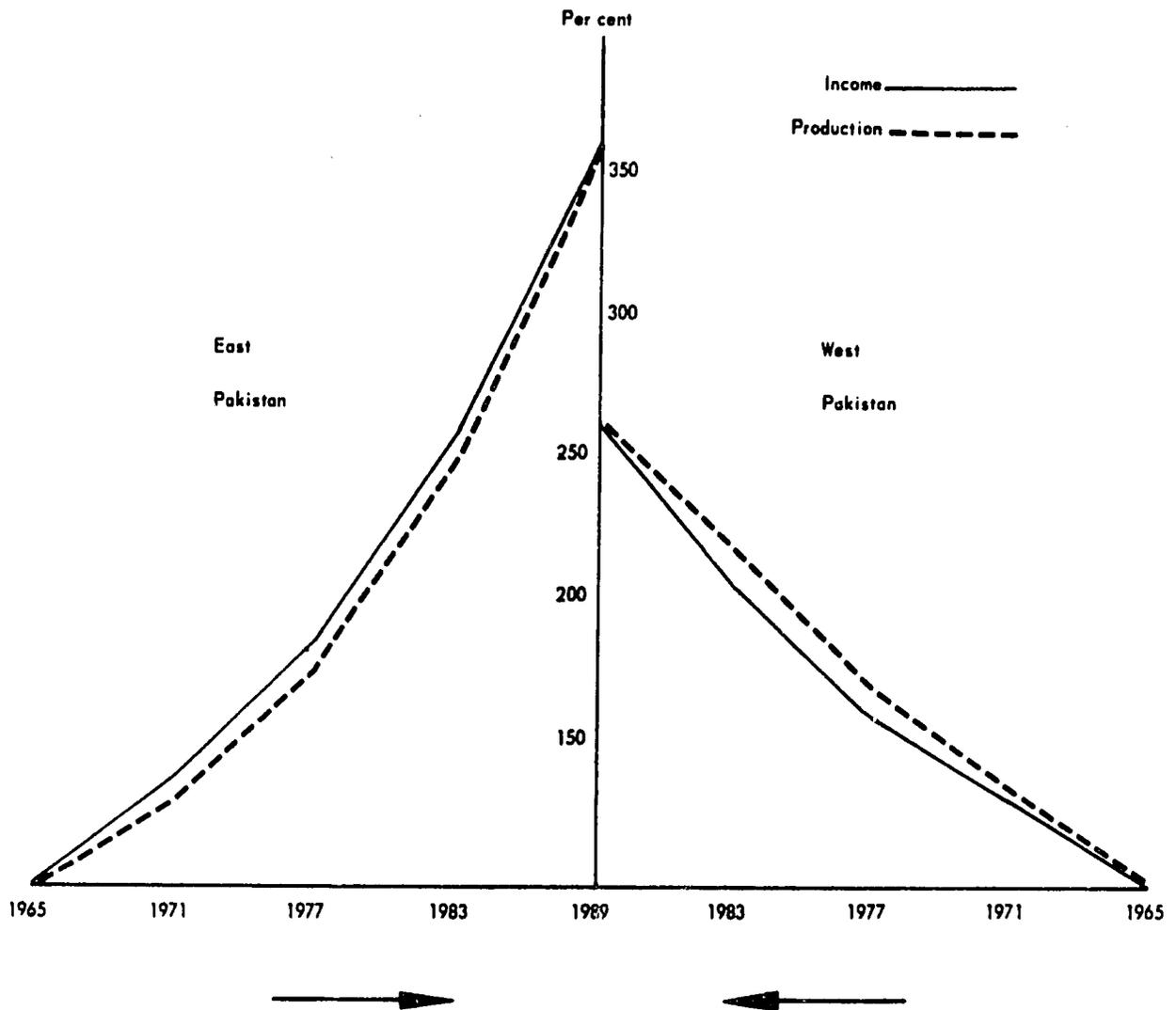
where q is an arbitrary constant representing the maximum percentage of regional production that is transferred. The second condition is given as:

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

The Basic Solution

The growth of regional income and production in the basic solution is shown in Figure 2. (The values of all variables in the solution and their shadow prices are given in Appendix Tables 3 and 4). By 1971, which corres-

FIGURE 2
Index of Income and
Production in the
Basic Solution



ponds approximately to the end of the Third Five-Year Plan, the difference in regional per capita income has been reduced to 26 per cent from a level of 30 per cent in 1965, falling to 20 per cent by 1974, and is eliminated by 1986.^{10/} This pattern of diminishing per capita income differences 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, whereas the model solution postpones the major decrease in disparity till the later 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 stipulated for 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 entire period, 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.

^{10/} The model was run for eight periods, each scaled to represent three years, in an effort to reduce 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.

This rate of growth for the national economy is well below that indicated in the Perspective Plan where a growth of 7.2 per cent per annum is forecast. Although no attempt has been made to choose precisely those parameters which would reproduce the Planning Commission's long-term growth pattern, it is of some interest to see what effect the regional considerations have had on the model results. Using the parameters that characterize the basic solution, but eliminating all regional considerations, a growth rate of 6.8 per cent per annum appears feasible. In terms of regional equity this goal implies a sharp increase in the level of disparity. Per capita income in this solution is Rs. 633 for East Pakistan and Rs. 1208 for West Pakistan. A failure to implement a positive regional policy will leave the income level in East Pakistan in 1985 only slightly lower, and that in West Pakistan considerably higher, as compared to the basic solution. It thus becomes apparent that, given the conditions postulated on the model, the major burden in equalizing regional income will be 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 5 (1980), while in West Pakistan the minimum investment constraint is operative. The combination of the high savings rate and the low level of investment 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 closed, as is the regional income-production difference. This autarchic requirement imposes a severe constraint on the pattern of regional growth. As long as there is an insistence on

FIGURE 3
Investment and Savings
in West Pakistan
(Basic Solution)

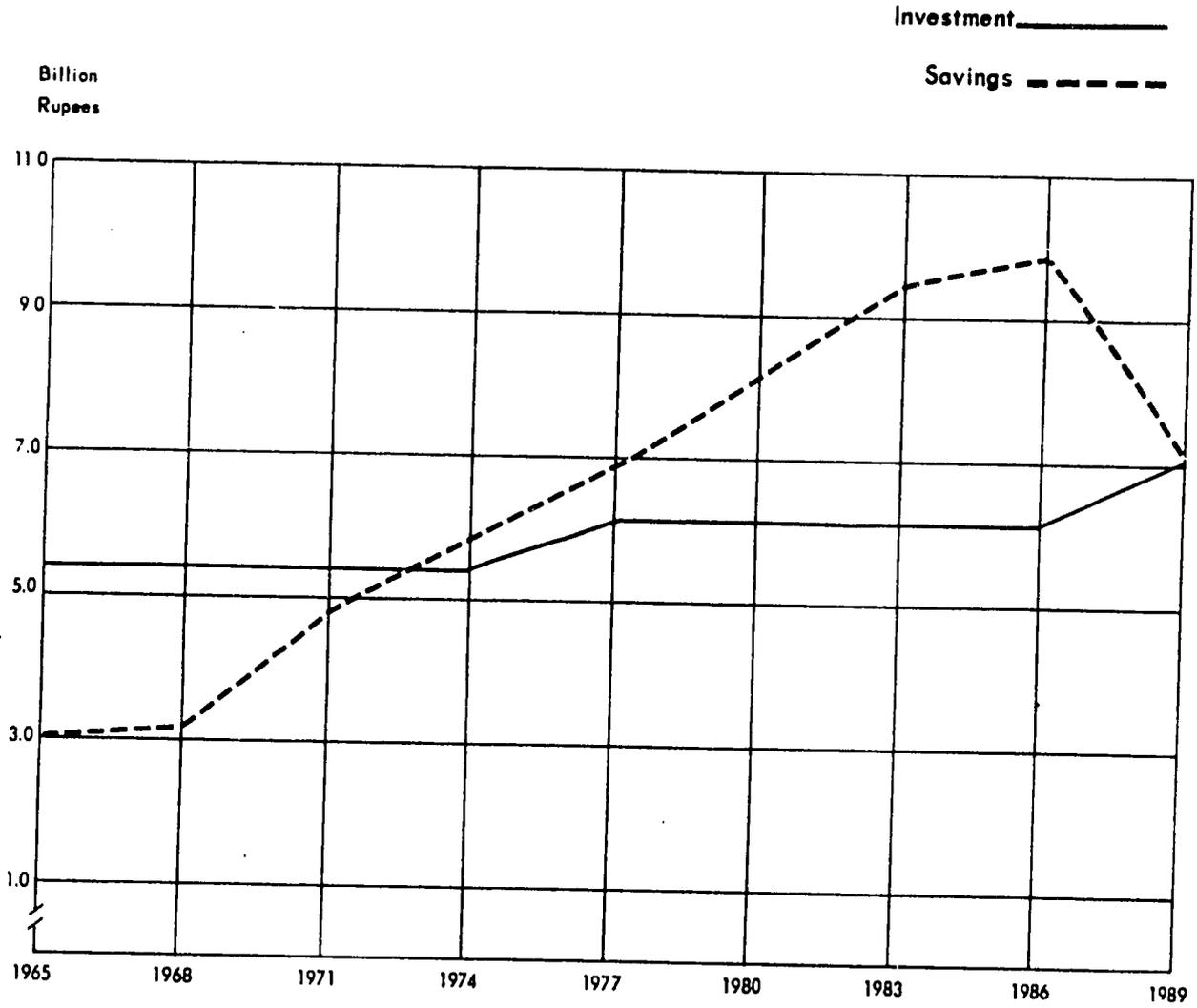


FIGURE 4
Investment and Savings
in East Pakistan
(Basic Solution)

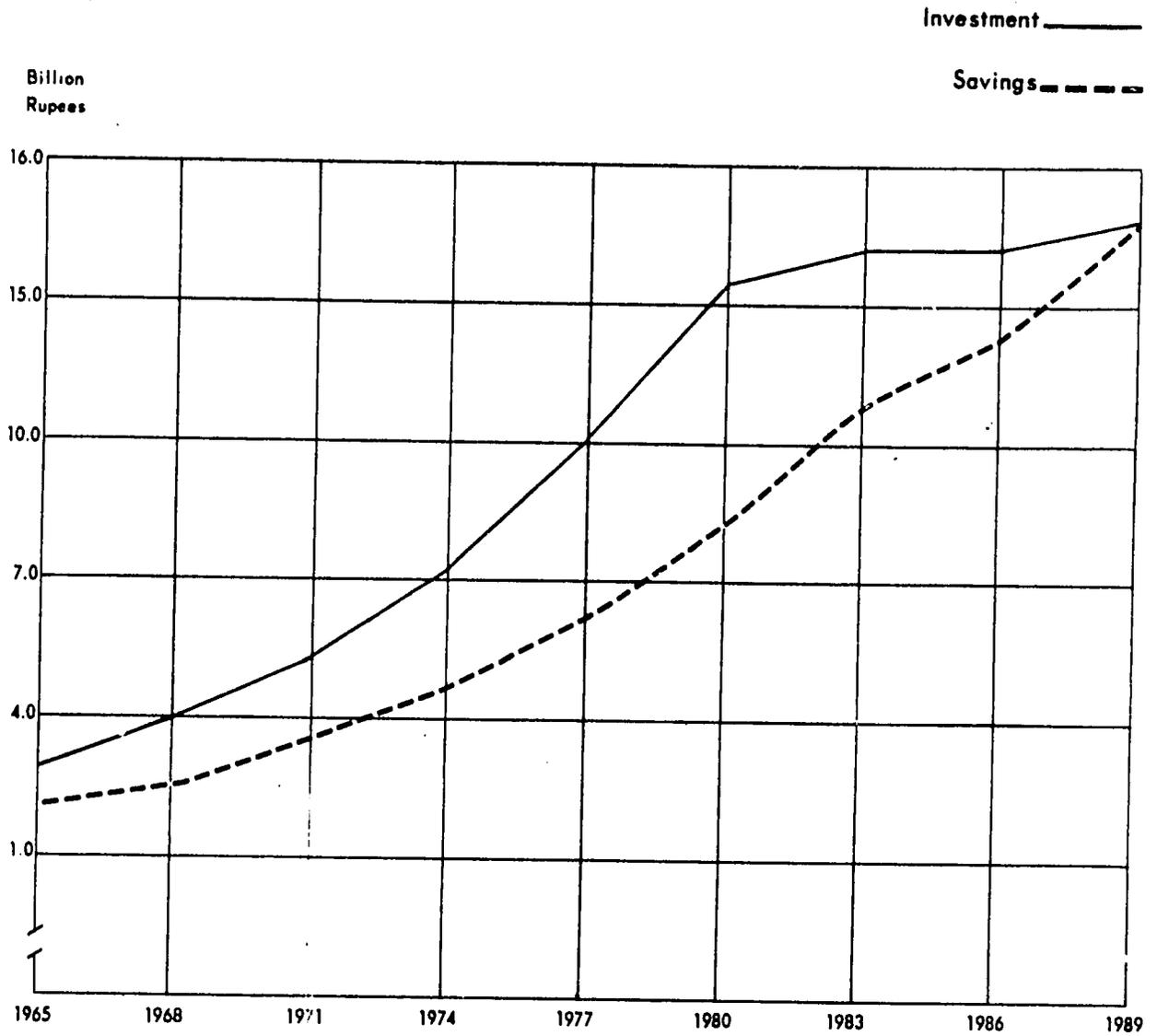
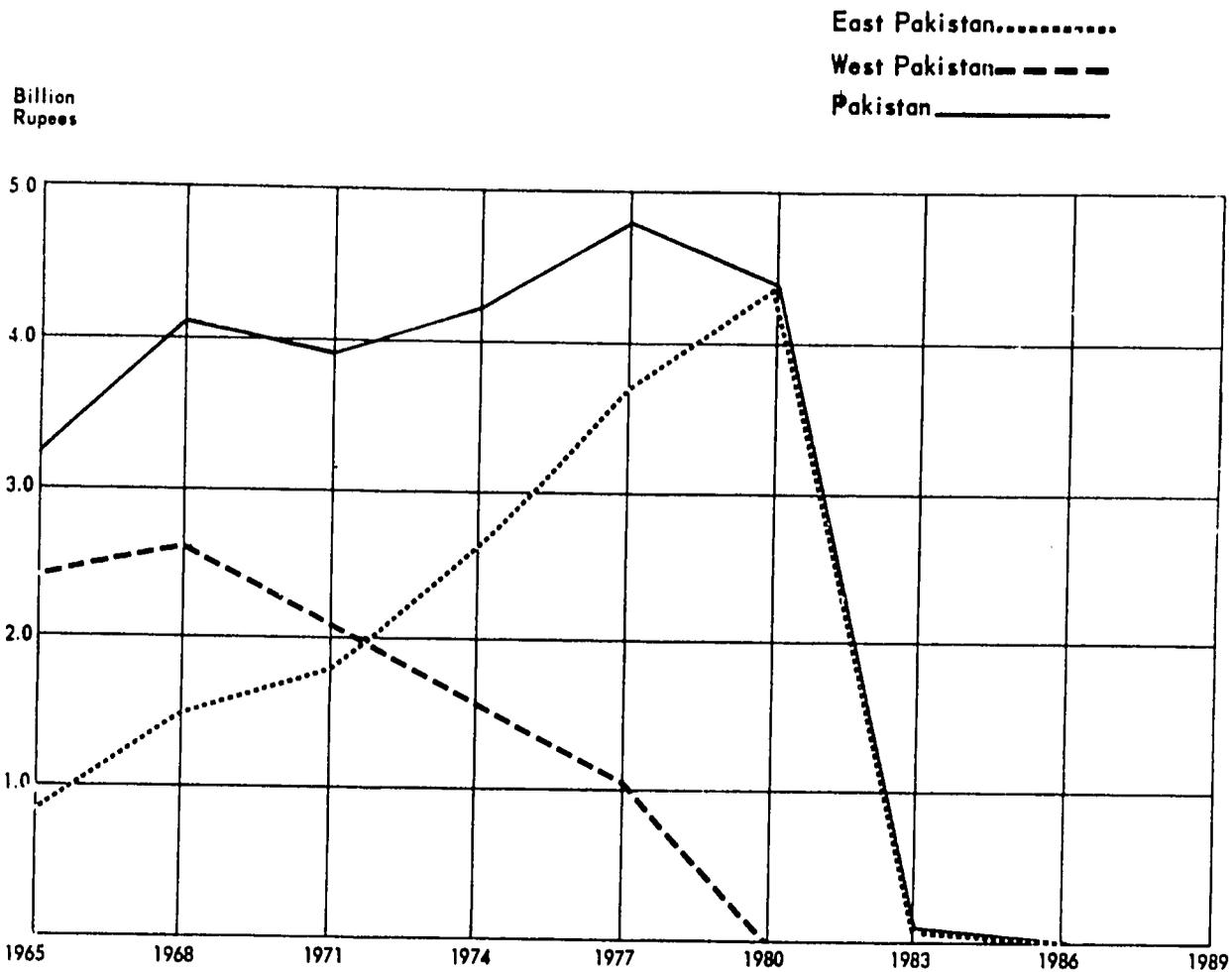


FIGURE 5
Foreign Aid in the Basic Solution



equating regional production and regional income by 1989, the terminal income level is set primarily in terms of East Pakistan's own productive potential. The growth rate in West Pakistan can merely adjust itself to this level. Finally, as regards the regional allocation of foreign aid, a sharp reduction in the aid inflow to West Pakistan is observed, so that after 1974, total foreign aid is destined for East Pakistan.

Alternative Patterns of Growth

While it is clear from the basic solution that the currently enunciated regional policy for Pakistan is a feasible one, at least in terms of the specification of the economic structure presented in this paper, the cost of such policy to the economy is more clearly brought out by a consideration of alternative growth paths.

Maintaining the equal income target but permitting regional transfers beyond 1989 yields an increase of nearly 10 per cent in the terminal income level. This increase is brought about as follows. The higher growth of production in West Pakistan generates a higher level of savings and hence permits an increase in 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 production capability.^{11/}

If in addition to the relaxation on the regional production-income gap a deterioration in the level of disparity is permitted, a further increase in the terminal income levels of both regions is possible. Such an alternative involves a rapid rate of growth of income in West Pakistan so that this

^{11/}The effects on the regional growth rates and income levels by varying the policy constraints are summarized in Appendix Table 5.

province reaches a level of per capita income of Rs. 703 in 1977. There is no subsequent growth of per capita income. 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 differences rather rapidly. Two factors should be noted. The level of disparity rises to 50 per cent before beginning to decline, and such a level may create an intolerable strain on the national fabric. Finally, the fact that the regional transfers are condensed into a relative short period, and hence form six per cent of West Pakistan's income for the period 1983 to 1989, may indicate that such a redistributive policy is unlikely to be implemented or to be feasible.

In the final case considered the redistributive effect is limited to a level below that made feasible by regional savings. 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 politically intolerable and administratively unfeasible.^{12/} Arbitrarily limiting such transfers to three 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 the implied redistribution effort is limited, the result will be a lower level of welfare for the population as a whole. And for the alternative solutions considered above,

^{12/} Precise estimates on the effects of redistributive policies carried out elsewhere are difficult to come by. A comparison of transfer payments as a per cent of national income for the period 1956 to 1961 shows that they averaged 6.2 per cent in the U.S.; 7.8 per cent in the U.K.; and 18.7 per cent in France [20] and [27].

where regional transfers play an even greater role, the cost in not implementing a regional transfer policy results in an even greater loss of 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 the economy is confronted with a clearer consideration of the opportunity cost of implementing such a policy, that 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 present level of disparity in percentage terms, would remain constant, at least over the Perspective Plan.

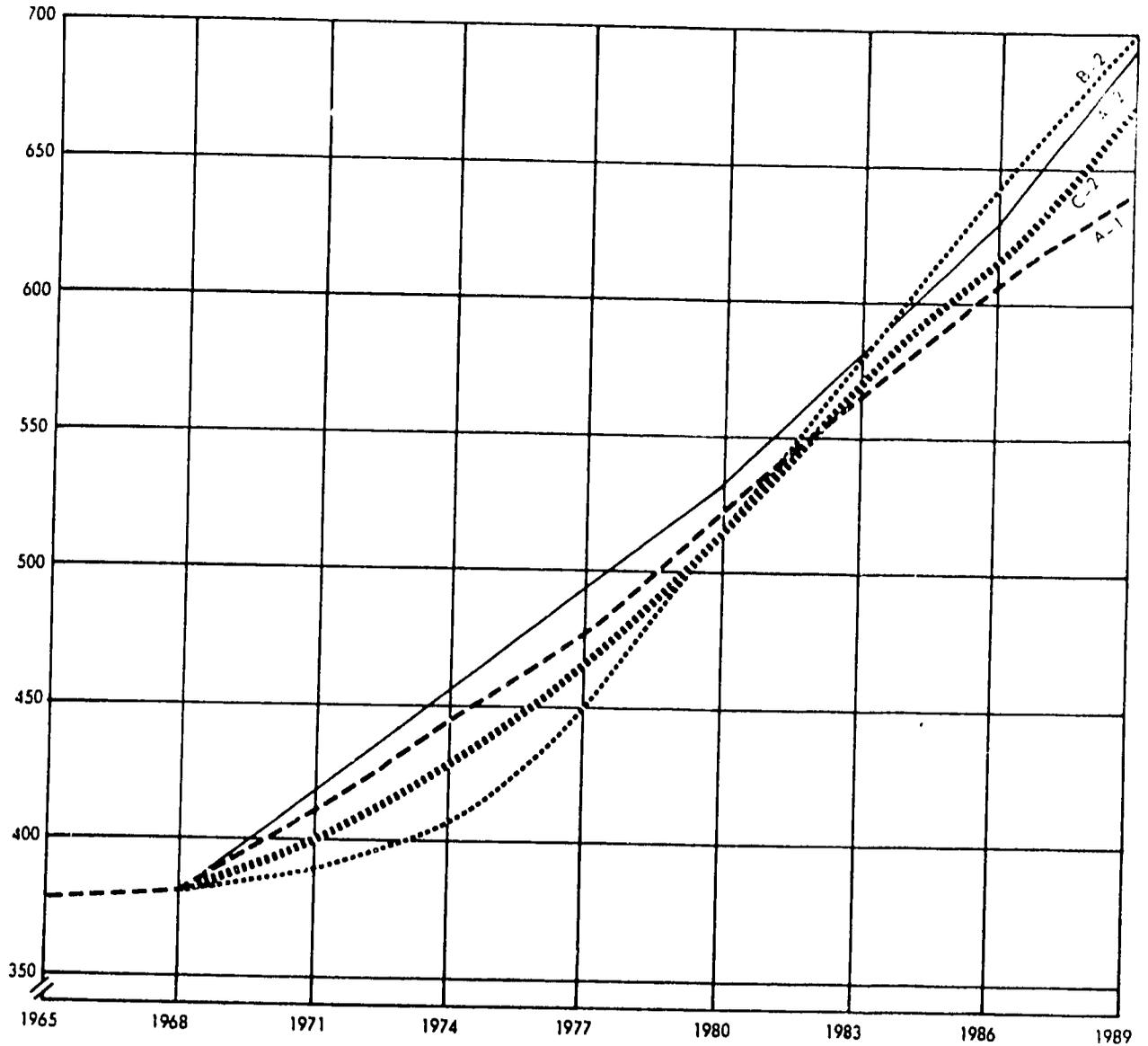
Such an equal per capita growth rate target can be considered as one end of a spectrum of regional growth targets with the equal per capita income solution at the other extreme. Solving the model for the equal regional growth rate target and then parametrically varying downward the permissible level of disparity, a curve is generated showing the trade-off between national (and regional) income levels and the level of disparity. (See Figure 7). Thus with a five per cent difference in regional per capita incomes in 1989, the per capita income in East Pakistan increases by one per cent

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

Rs/Capita



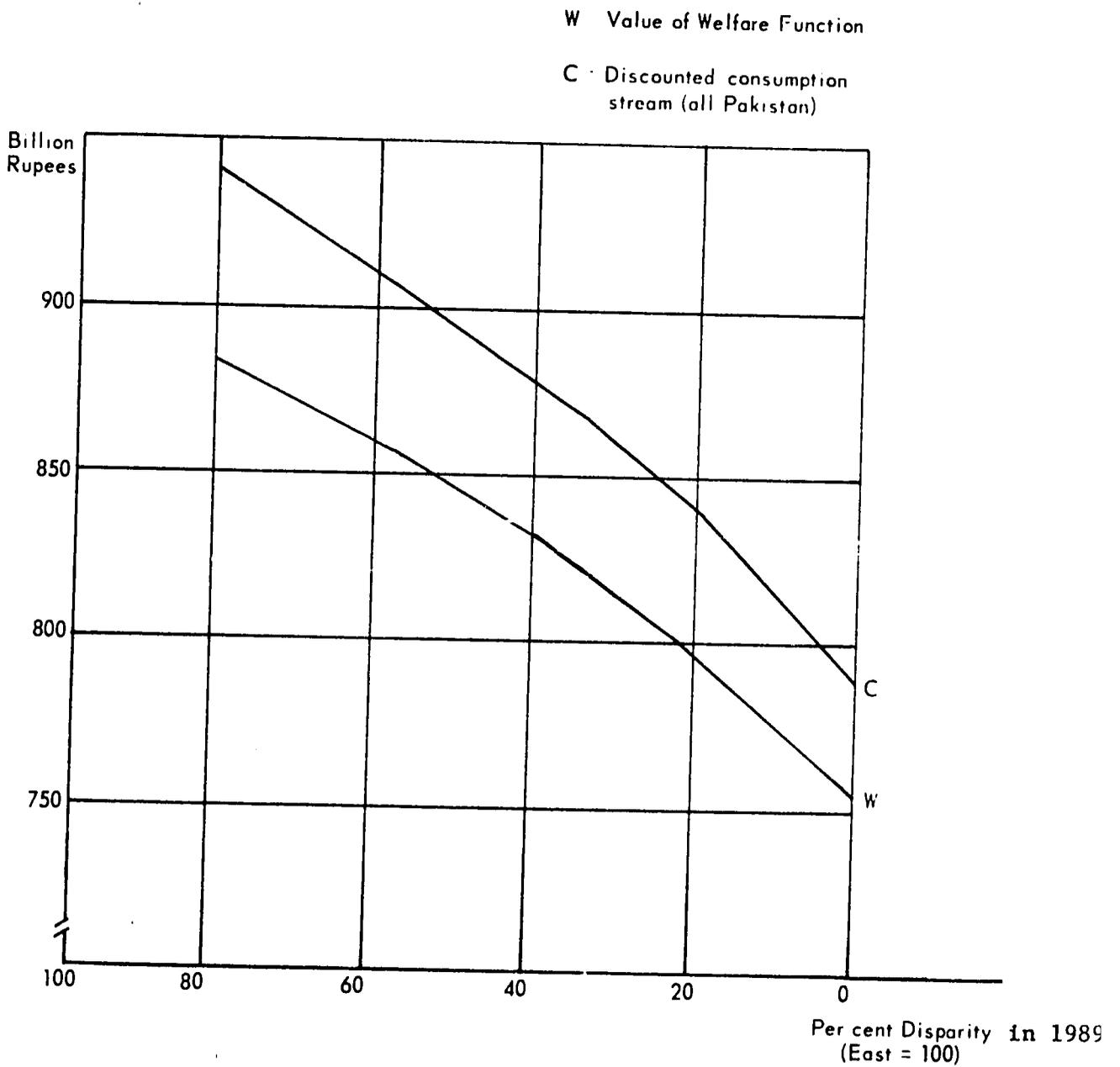
(See Appendix Table 5) over the strict parity solution, while if the target is to equate per capita growth rates in the two provinces, an increase of nearly six per cent in per capita income in East Pakistan is possible.

The alternatives open to the policy makers present an opportunity for political bargaining. In return for a relaxation of the regional disparity constraint, which is presently imposed on the Planning Commission, East Pakistan can be offered the possibility of a higher level of future income. For West Pakistan the choice is also for a higher income level but at the cost of underwriting a considerable redistribution of income over time. Such bargaining situations are more appropriately stated in terms of probable outcomes rather than clear certainties. While it is possible to show both regions better off once the absolute parity constraint is relaxed, given the simplistic structure of the model, the attractiveness of such alternative regional targets will depend, perhaps crucially, on the degree of certainty with which the policy makers of each province view these alternatives. The purpose of presenting such alternatives is primarily to permit consideration of a wider choice in framing regional policies and such a reformulation of the present restrictive regional policy is called for if national growth as well as regional welfare is considered an objective.

Variations in Absorptive Capacity

An analysis of the results presented above indicates that the major bottleneck in meeting both the regional welfare target and achieving a high rate of growth for the national economy is the absorptive capacity constraint. Since, at the same time, this parameter reflects a largely arbitrary judgment, it is worthwhile to consider the effect of variations on the results implied by changes in this constraint.

FIGURE 7
Effect of Alternative Regional
Targets



Raising the absorptive capacity constraint in East Pakistan from 11 to 13 per cent, equal to that in West Pakistan, results in a rise of the terminal year per capita income level to Rs. 715 as compared to Rs. 640 in the basic solution. The level of disparity is eliminated more rapidly than in the basic solution, although absolute parity in the levels of per capita income is still not reached till 1986. The effect of positing an equal absorptive capacity for both regions is to eliminate nearly all differences in the growth potential of the two regions. This solution is therefore inconsistent with the hypothesis that the difference in the past growth performance of the two regions reflects a basic difference in the economic potential of the two regions.

The sensitivity of the results to the absorptive capacity constraint are more clearly brought out by raising the limit on new investment in East Pakistan to 16 per cent per annum. At this level for the absorptive capacity constraint the "shadow price" on the regional parity equation falls to Rs. 50.1 billion or only 6 per cent of the "shadow price" found in the basic solution, indicating that at such a rate of growth of investment parity in incomes per capita between the two regions can be obtained at relatively little cost in terms of growth foregone. The rate of growth of per capita income is 2.7 per cent in East Pakistan and 2.5 per cent in West Pakistan. It is apparently a similar assumption on the possibility of raising investment in East Pakistan at such a high rate that underlies the projections on regional growth prepared by the Pakistan Planning Commission. The terminal income level of Rs. 891 per capita for both regions is close to that forecast in the Perspective Plan.^{13/}

^{13/} Part of the difference found in the present analysis and that of the Planning Commission can be explained by the slightly higher rate of population growth used here. [17]

There is little a priori reason for rejecting such a high rate of investment for East Pakistan. Nevertheless acceptance of such a high rate should be placed in a somewhat broader perspective. A rate of increase of investment of 16 per cent per annum would place the performance of East Pakistan above the historically observed maximum rate of growth of investment for fifty countries. [4]

Appeal to historical experience of other countries cannot be used to rule out a more dynamic development pattern in Pakistan. Indeed over the period 1949/50 to 1964/65 the rate of increase in investment in Pakistan was close to 20 per cent per annum. [18] This however is measured from an extremely small base and gives little support to the possibility of maintaining such a rapid pace over the next twenty years. It is clearly necessary to consider the factors that made the past increase possible. The fact that 2,500 man-years of technical assistance were made available to West Pakistan over an eight year period to assist in the preparation of projects for the water and power sectors undoubtedly raised the absorptive capacity of that province. A Ganges-Brahmaputra study of a similar scale in East Pakistan would perhaps permit equally vast investments there. Only a careful study of the factors that inhibit the rate of growth of investment can, in the final analysis, resolve the question of what is a reasonable limit to the future growth of capital formation. Nevertheless some alternative patterns can be considered.

Rapid increases in investment often tend to be accompanied by rising trends in the capital-output ratios. Admitting an absorptive capacity ceiling of 16 per cent but coupling this with a rising capital coefficient yields a terminal year per capita income level only six per cent over that found in the basic solution. An additional alternative considers the possibility

that the ability to absorb investment is a dynamic aspect of development likely to respond to past growth rates. That is, in so far as the absorptive capacity bottleneck reflects lack of skilled managerial talent and organizational ability, these factors are likely to become less scarce after a period of rapid increase in the investment level. A precise specification of such an absorptive capacity function is beyond the scope of this paper. It can be approximated however by letting the investment limit vary upward over time in East Pakistan from its initial level of 11 per cent in 1965 to 16 per cent in 1980. The result is an increase in the terminal income level to Rs. 733 per capita, an increase of 12 per cent over that found in the basic solution.

While the discussion of absorptive capacity constraints brings into focus the critical role this parameter has on the possibility of achieving regional parity at a minimum cost to the national economy its specification must be considered unsatisfactory. Without a more precise study of the specific factors that determine the limit on efficient capital accumulation it is only possible to conclude that unless investment growth in East Pakistan can be stepped up dramatically, the present regional parity target will have severe repercussions on the national growth rate.

IV: Regional Growth and the Structure of the Regional Economies

As previously noted, it is desirable to quantify the sectorial structure implied by alternative solutions of the macro-economic solutions. Such a procedure may well introduce some inconsistencies into the analysis. Before proceeding therefore it is necessary to spell out some of the difficulties.

There is no great obstacle to specifying a consistent set of initial conditions for both the macro and the sectorial model. More important is the need to ensure comparability over time in the two models. The main divergence which is likely to occur is in the relationship of the sectorial capital-output ratios and the aggregate capital-coefficients for each region used in the aggregate model. As an initial condition the aggregate capital-coefficient for each region can be calculated from the sectorial composition of regional output and sectorial capital-coefficients. Over time, however, the weighted sum of the sectorial capital-coefficients will change as the relative output levels of the various sectors change. Neither the direction nor the magnitude of such changes can be estimated a priori. One possible solution is to solve the "time-path" model using a constant capital-coefficient and then, using these results, specify a number of exogenous variables in the sectorial model. The sectorial output levels thus derived 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 coefficients are generated whose value over time approximates that derived from the changes in the sectorial composition of output.

A second difference between the "time-path" model and the sectorial model is that the regional economies have been characterized by diminishing returns to investment in the aggregate model. The sectorial 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 sectorial 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 apparent that the relationship between the two models is far from straight forward and that some inconsistency may be introduced into the analysis. This "cost" should however be weighed against the additional insights to be gained by analyzing the dynamic as well as structural changes of the growth process.

In order to allow for a considerable degree of disaggregation, the sectorial model is limited to a static analysis covering two time segments, 1965 to 1974 and 1974 to 1986. ^{14/} The constraints of the sectorial 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 in Table 5. In what follows a brief description of the various equations is given:

^{14/} These unequal time segments result from the use of three-year time periods in the macro economic model.

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 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 τ , wherever it appears, is a necessary terminal condition for conversion of the flow of investment over the decade to capital stock.

3) Foreign Imports. Equation (a) 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. Equation (b) limits competitive imports into any one sector to a certain level ($\bar{\varphi}$) of total demand.

TABLE 4

Sectorial Model Equations

<u>Equation Set No.</u>	<u>Equation</u>	<u>Constant or Controlled Variables</u>	<u>No. of Equation</u>
1. <u>Output Determination:</u>			
	$k^X_i - \sum_{j=1}^n k^a_{ij} k^X_j - k^I_i - k^R_i - k^l r_i + k^M_i + k^r_i$	$\geq k^C_i + k^E_i + k^l l_i - k^m_i$	(42)
2. <u>Investment Demand</u>			
a)	$\sum_{i=1}^m k^I_i + i = \sum_{m}^n + 1 k^I_i + MI$	$= k^I$	(2)
b)	$\tau k^I_i - \sum_{j=1}^m k^b_{ij} k^X_j + \sum_{j=m}^n + 1 k^{\beta}_{ij} k^X_j$	≥ 0	(12)
c)	$\tau k^{MI} - \sum_{j=1}^m k^z_j k^X_j - \sum_{j=m}^n + 1 k^Z_j k^X_j$	$= 0$	(2)
3. <u>Demand for Foreign Imports:</u>			
a)	$\sum_{i=1}^n k^{\bar{M}}_i + k^{MI} + \sum_{j=1}^m k^p_j k^X_j + \sum_{j=m}^n + 1 k^{\beta}_j k^X_j$	$= k^E + k^R + k^F - k^{MC}$	(2)
b)	$k^{\bar{M}}_1$	$\leq \bar{\phi}_i X_i$	(12)
4. <u>Import Substitution:</u>			
a)	k^R_i	$\leq k^{\phi} k^R$	(16)
b)	$i = \sum_{m}^n + 1 k^R_i$	$\leq k^R$	(2)
c)	k^r_i	$\leq k^{\lambda r} k$	(16)
d)	$k^r_i - (1 + \theta_i) k^l r_i$	$= 0$	(16)
e)	$i = \sum_{m}^n + 1 (1 + \theta_i) k^l r_i$	$\leq k^r$	(2)

TABLE 5

Variable and Parameter Definitions
for the Sectorial 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
\bar{M}_j	= 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	= upper bound on import substitution for foreign trade in sector i

Parameters

- $\bar{\phi}$ = upper bound on competitive imports 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 " " is used to indicate that the sectors referred to are trade-improving sectors.

4) Import Substitution. The total amount of nontraditional production is set exogenously. The sectorial 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.

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 sectorial 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 sectorial 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 sectorial 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 sectorial 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 addition, the effect of restraining growth in West Pakistan has a dramatic effect on

the agriculture sector. 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 six 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-economic 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.

TABLE 6

Structural Change in the Pakistan Economy
(Per cent)

<u>East Pakistan</u>					
<u>Sector</u>	<u>1955</u>	<u>1960</u>	<u>1965</u>	<u>1974</u>	<u>1986</u>
1. Agriculture	63.0	60.4	55.3	48.3	43.3
2. Manufacturing	4.7	6.0	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>West Pakistan</u>					
<u>Sector</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>Pakistan</u>					
<u>Sector</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%

Source: 1955-1965 [13]
1974-1986: Based on equal regional growth rate solution.

V. Regional Growth:

The Policy Implications

One can identify two clear goals in Pakistan's long term development plans: to raise the level of well-being for the population as a whole as rapidly as possible and to do so while ensuring an equitable distribution of income. In isolation the first objective would maximize the growth of the national economy with little or no attention to regional welfare. While economically sound such an alternative runs the risk of endangering national unity.

At the other extreme lies the present policy of equating per capita incomes by 1985. On the assumptions embodied in this analysis such a policy would appear to sacrifice a considerable amount of growth to achieve the regional equity target. Nevertheless the present strict parity target is likely to have a certain appeal to East Pakistan since the attainment of equality in per capita incomes depends primarily on each region's capacity to generate income and relies only to a minimal extent on a redistribution of income from West to East Pakistan. Given the past alleged regional bias on the part of the central government, East Pakistan may well feel that any policy that looks towards an amelioration of the regional income differences through an active redistribution policy is unrealistic. In fact East Pakistan may decide that any deviation from the present regional target will only result in a more rapid rate of growth of income in West Pakistan which will not be off-set by a redistribution of income. It seems unlikely however that the present policy can be carried out if, as the results of the present analysis indicate, the implication is for a sharp reduction in the growth rate

in West Pakistan. Not only can one have serious doubts as to the possibility of actually implementing the policies necessary to frustrate the dynamism of this region but such a policy entails considerable political risks as well.

A realistic assessment of alternatives indicates that there is a need to frame a regional policy that lies somewhere between these two extremes. One such alternative is to equate regional growth rates over the Perspective Plan period (1965-1985) thus maintaining the initial thirty per cent difference in regional product per capita but using a redistribution policy to reduce the income per capita differences to one third the 1965 level. In effect this policy postpones a complete removal of disparity to some time after the end of the Perspective Plan.^{15/} One critical element in assessing this policy is to judge the feasibility of implementing the distributional aspect of this solution. For the period as a whole the transfer payments form 7.5 per cent of factor incomes in West Pakistan in the equal growth rate solution (F-2). Such a level of transfer payments is relatively large although over the period 1956-1961, transfer payments averaged 6.2 per cent of national income in the United States and 7.8 per cent in the U.K. [20][26] Redistributive expenditures usually take the form of pension payments, family allowances, expenditures on health and education, and other subsidies. One particular form of subsidy in the Pakistan situation might be related to the process of agricultural development in West Pakistan. The rapid

^{15/} Indeed it seems likely that once growth is accelerated in East Pakistan the demands for absolute parity in per capita income levels may become less strident.

increase in agricultural output in that province could be used to subsidize food expenditures in East Pakistan. While such policies need to be considered in greater detail than is possible here, it is not unreasonable to foresee a surplus food program for East Pakistan based, not on US supplied surplus food imports, but on inter-regional trade in food grains. Although the level of redistributive payments is not inconsequential it does not appear to be of such a magnitude that this type of a solution to the regional problem need be rejected outright.

Brief mention should also be made of the likely impact of alternative policies on the aid giving countries. Regardless of which regional target is adopted the economy will continue to depend on external assistance for some time. Yet increasingly donor countries and agencies have allocated such aid to recipients whose past performance indicates a high return on such assistance. If Pakistan is therefore to attract the required level of foreign aid, it must adopt a set of regional policies consistent with a high national growth rate. The substitution of a policy based on equal per capita regional growth rates for the present policy of equating regional income levels would appear to be a realistic alternative open to the government. Not only would it allow for an increase of welfare in both regions and utilize more fully capacity in West Pakistan, but it is likely to be the regional policy with the greatest possibility of successful implementation.

The consideration of alternative regional growth targets may lead to a further evaluation of this policy in Pakistan. It is necessary however to recall again that all the alternatives considered reveal the critical role played by the absorptive capacity limit on investment especially in East Pakistan. Any policy aimed at raising the level of investment that can be efficiently employed in that province will tend to ameliorate the regional growth problem. A long run development strategy for Pakistan should therefore

consider the factors that might inhibit a rapid pace of capital formation in East Pakistan and promote those policies that will remove such obstacles in the future. For unless it is possible to step up the rate of investment in East Pakistan to a level considerably above that in West Pakistan a solution to the regional equity problem is likely to involve a reduction in the national growth rate.

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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 (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-Perspective 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

a/ Trend values derived from least squares regression fitted to actual data, 1960-1965. Data from: 13, 15

b/ 2

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
- μ = exogenous rate of growth for foreign exports
- π = exogenous rate of growth for regional exports
- β_2 = relative productivity of "fair" (type 2) investment
- β_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>Year</u>	<u>Income</u>	<u>Con- sumption</u>	<u>Invest- ment</u>	<u>Foreign Exports</u>	<u>Trade^{a/} Imports</u>	<u>Regional Exports</u>	<u>Trade Imports</u>	<u>Savings</u>	<u>Current Inflow</u>
1965	22.7	20.5	2.3	1.6	1.0	0.6	1.0	1.0	0.0
1966	25.0	22.9	2.1	1.8	1.0	0.6	1.0	1.0	0.0
1971	28.5	26.5	2.0	2.0	0.0	0.0	1.0	1.0	0.0
1977	30.3	27.2	3.1	2.0	0.0	0.0	1.0	1.0	0.0
1977	34.3	31.2	3.1	2.0	0.0	0.0	1.0	1.0	0.0
1980	40.3	37.0	3.3	3.0	0.0	0.0	1.0	1.0	0.0
1983	46.5	43.5	3.0	3.0	0.0	0.0	1.0	1.0	0.0
1986	59.0	54.2	4.8	5.7	0.0	0.0	1.0	1.0	0.0
1989	64.9	59.0	5.9	7.2	0.0	0.0	1.0	1.0	0.0
		64.9	16.8	9.0	0.5	1.4	1.9	16.3	1.0

West Pakistan^{b/}

1965	24.6	21.6	3.0	1.4	4.2	1.0	0.6	3.0	2.1
1966	27.0	23.9	3.1	1.7	4.8	1.1	0.6	3.0	2.1
1971	30.8	27.5	3.3	2.5	5.1	1.2	0.7	3.0	2.5
1977	31.0	28.9	2.1	3.2	5.1	1.2	0.8	3.0	2.1
1977	35.7	31.7	4.0	4.0	5.1	1.3	0.8	3.0	1.6
1980	38.8	35.1	3.7	4.0	5.7	1.3	0.9	3.0	1.6
1983	43.0	39.0	4.0	4.4	5.5	1.4	1.0	3.0	(1.9)
1986	48.3	43.3	5.0	5.0	5.5	1.4	1.0	3.0	(1.9)
1989	57.1	51.1	6.0	6.0	6.6	1.5	1.0	3.0	(1.9)
		57.1	21.1	10.1	10.7	1.9	1.0	10.0	1.9

^{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 Year</u>	<u>Income</u>	<u>Con- sumption</u>	<u>Invest- ment</u>	<u>Foreign Exports</u>	<u>Trade Imports</u>	<u>Regional Exports</u>	<u>Trade Imports</u>	<u>Savings</u>	<u>Capital Index</u>
1965	47.3	42.2	8.2	3.0	6.1	---	---	---	---
1968	52.3	46.7	9.3	3.5	7.6	---	---	5.1	3.2
1971	60.9	54.0	10.7	4.8	8.6	---	---	5.7	4.1
1974	69.7	61.2	12.6	6.0	10.1	---	---	6.8	3.0
1977	80.7	69.5	16.0	7.6	12.4	---	---	8.6	4.2
1980	94.4	79.1	19.6	9.6	14.0	---	---	11.2	4.3
1983	109.8	89.6	20.3	12.1	12.1	---	---	15.2	4.4
1986	127.6	107.3	20.3	15.2	15.2	---	---	20.3	0.03
1989	145.9	122.0	23.9	19.1	19.1	---	---	20.3	---
						---	---	23.9	---

East 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	2.8	---	2.8	---	---	---	---	---	---	---
1968	3.2	0.7	1.3	---	---	56.6	---	22.7	---	---
1971	4.6	0.3	1.3	1.3	1.3	62.9	---	25.3	---	---
1974	6.6	1.1	1.8	1.8	1.8	69.5	2.3	27.9	0.6	---
1977	8.0	1.4	2.4	2.4	2.4	79.4	4.3	31.0	1.1	---
1980	9.3	1.7	3.3	3.3	3.3	92.3	7.1	37.0	1.2	---
1983	11.0	3.0	4.3	4.3	4.3	119.4	11.3	44.3	3.0	---
1986	13.0	6.2	5.1	5.1	5.1	136.3	26.4	50.6	3.4	---
1989	15.0	8.2	3.9	---	---	148.0	39.3	58.0	10.3	---
	16.0	10.7	5.2	---	---	166.5	59.2	66.0	14.3	---

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	0.6	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	33.8	42.7	9.7	---
1986	4.7	1.4	6.1	---	---	142.5	42.7	47.5	6.8	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	4.3	3.0	5.5	3.5	1.8	158.3	14.1	57.3	2.0	1.5
1974	3.4	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	227.3	43.2	82.4	9.6	1.2
1983	13.9	7.4	12.3	6.1	1.8	254.4	65.2	93.3	16.4	---
1986	13.7	7.6	14.3	5.9	---	290.5	82.5	100.4	19.3	1.9
1989	15.1	8.9	17.8	6.2	---	327.1	101.9	120.4	25.5	---

APPENDIX TABLE 4

Shadow Prices in the Basic Solution

<u>Foreign Trade Constraint</u>		<u>Productive Capacity Constraints</u>				<u>Savings Constraint</u>	
<u>East</u>	<u>West</u>	<u>Regular Trade East</u>	<u>Regular Trade West</u>	<u>Regular Trade East</u>	<u>Regular Trade West</u>	<u>East</u>	<u>West</u>
0.00	0.21	22.06	0.00	2.06	2.90	---	---
0.00	0.13	23.02	0.00	1.92	1.92	0.13	0.13
0.00	0.10	20.05	0.00	1.50	1.50	0.10	0.10
0.00	0.08	17.08	0.00	1.16	1.16	0.08	0.08
0.00	0.07	14.58	0.00	0.92	0.92	0.06	0.27
0.00	0.09	12.00	0.00	0.71	0.71	0.11	0.28
0.00	0.14	9.00	0.00	0.48	0.48	---	---
---	---	6.00	0.00	0.18	0.32	6.59	---

Investment Constraint

<u>"Good"</u>	<u>"Fair"</u>	<u>"Bad"</u>	<u>"Good"</u>	<u>"Fair"</u>	<u>"Bad"</u>	<u>Minimum Investment Growth Constraint</u>	
<u>East</u>	<u>East</u>	<u>East</u>	<u>West</u>	<u>West</u>	<u>West</u>	<u>East</u>	<u>West</u>
24.10	17.86	11.53	0.96	0.48	---	---	0.22
14.10	14.05	9.04	0.87	---	---	---	0.15
11.00	11.00	7.00	0.80	---	---	---	0.10
9.00	9.00	5.00	---	---	---	---	0.08
7.00	7.00	4.00	---	---	---	---	0.07
5.00	5.00	3.00	---	---	---	---	0.05
3.00	3.00	2.00	---	---	---	---	0.03
1.00	1.00	1.00	---	---	---	4.00	0.01
---	---	---	---	---	---	3.40	---

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		2.24

APPENDIX TABLE 5

Summary of Solutions Using Alternative Targets, Policies, and Parameters

Solution	Characteristic of Solution	Terminal	Rate of Growth of Income		
		Year Income (Rs./Capita)	East	West	Pakistan
			(Per cent)		
<u>I. Basic Parameters</u>					
A-1	Equal per capita income ^{2/}	640			
A-2	Equal per capita income	695	5.5	4.1	4.8
B-1	Equal per capita income; disparity widens first	700	5.7	4.4	5.2
B-2	Equal per capita income; regional transfers limited to 3% of income of West Pakistan	634	5.2	4.5	5.4
C-2	Equal per capita income; regional transfers limited to 3% of income of West Pakistan	678	5.3	4.0	4.8
D-	No regional income constraints	533 (East)	5.6	4.4	5.1
		1208 (West)	5.4	7.4	6.8 ^{3/}
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
<u>II. 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	5.1	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 to 3.05	614	5.3	3.9	4.6
M-1	Absorptive Capacity East Pakistan Rises to 16%	733	6.1	4.7	5.4

APPENDIX TABLE 5 (Cont.)

<u>Solution</u>	<u>Consumption</u> <u>Discounted</u> (Rs. Billions)	<u>Foreign Aid</u> <u>Discounted Undiscounted</u> (Rs. Billions)		<u>Shadow Price</u> <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	745.65	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	763.87	49.6	96.7	330.46
K-1	760.29	44.5	86.7	124.16
L-1	625.21	42.2	84.0	339.26
M-1	812.20	45.6	95.1	296.20

^{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 G
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	0.09	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	0.06	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	1985	1965-74	1974-85
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	0.29	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 %	6.7 %

^a Includes 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	9.7	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