CHAPTER 5. MEASURING THE DEVELOPMENT EFFECTS OF THE
DISASTER RELIEF PROVIDED TO GUATEMALA: A
MACRO ECONOMIC APPROACH

1. Introduction

This is the first of three chapters that aim at finding evidence of the extent to which disaster relief, in addition to its compensatory effect, may increase the development capacity of the recipient country or region. In the present chapter we compare the post-earthquake development of the Guatemalan gross domestic product (1976-80 GDP) with an estimate of the pre-earthquake trend. This is done to see if there is any indication of a significant net development-inducing effect of the disaster relief and relief operations in Guatemala during that period. In the next two chapters we gradually reduce the level of aggregation and first investigate the character of the disaster relief operations and then attempt to identify individual relief projects to illustrate in more detail the development effects we have indicated so far.

To provide a clearer idea of the reasons underlying the empirical procedure just described, and of its contents, we shall start this chapter with a discussion about the relevance of the empirical methods used. Then we make an attempt to estimate the overall economic impact of the disaster relief. This estimate will be expressed in terms of gains in total real output during the post-disaster period. The chapter concludes with a summary of findings.

2. An Empirical Approach

We shall start by using the concept of growth in a conventional way to study changes in the conditions for economic development (see Kindleberger, C., 1965, chapter I, or, Adelman, I., 1961, chapter I, II). We consider that the long-term rate of growth of real output is a crucial indicator of economic development. Therefore, we shall first examine the rate of growth of total output to see if there is any indication of a net development-inducing effect of the disaster relief.

From an empirical viewpoint, it is difficult to examine the relation between the disaster relief and its effects upon the total output growth capacity. Primarily, this difficulty concerns the identification of causal factors inducing growth changes, i.e., what changes are induced by relief and what are induced by other sources of growth. One way of tackling this problem would be to construct a model where all sources of growth are explicitly considered and then under some hypothesis estimate the contribution of foreign disaster relief under ceteris paribus assumptions. However, the "dualistic" characteristics of LDC's economies, the special LDC characteristics of markets and institutions, the lack of information about all relevant factors involved, etc., make it practically very difficult, perhaps impossible, to construct such a comprehensive model (Streeten, 1966; cf. our discussion in chapter 4, section 3.1).

Another approach would be to compare growth rates of production among countries that are similar in important aspects. For example, this may imply comparing the situation of Guatemala after the earthquake with that for countries which may have been stricken by disasters of a similar type and magnitude and which prior to the disaster had the same economic structure as Guatemala. But to find such countries and the appropriate data would obviously be a very difficult task.

Instead, we have chosen the following approach. First, we try to compare the actual growth rate for the GDP 1959-80 with the trend that real output would have followed if the earthquake had not occurred. This latter trend is calculated on the basis of the values of the GDP for 1959-75, i.e., with post-disaster real output excluded. Second, we analyze the development of the GDP during the post-disaster years, 1976-80. Here, we calculate the gains in real output attributable to disaster relief from abroad on the basis of comparison of estimates of these paths: (a) the actual path of real output (here called actual development with disaster), (b) a path for the development of real output deducting the capacity effects of the foreign disaster assistance provided to Guatemala (called actual development without disaster relief), (c) the path from the predisaster period which real output is assumed to have followed if the earthquake had not occurred (called autnomous development without disaster) and (d) the previous path with a reduction for the effects of the disaster damages that occurred in 1976 (autonomous development with disaster). The effects of the disaster relief provided will here be reflected at least by the difference between (a) and (b) and at most by the difference between (a) and (d).

The procedure just described does not mean that the identification problem discussed earlier will be solved. It only means that with the help of the assumptions used we shall obtain a first rough idea of development inducing effects in the disaster relief. Therefore, these estimates have to be taken with caution.

Different studies about the conditions of LDCs, e.g., the studies of Adelman-Morris (1971) and ILO (1976),

have indicated that a typical feature of growth in low-income countries is that it is combined with increasing inequality. Adelman-Morris (ibid. p. 12) claim that "economic development is associated with increases in the share of the bottom 20 per cent only after relatively high levels of socio-economic development have been obtained. At the earlier stages of the development process economic development works to the relative disadvantage of the lowest income groups".[*] As a result, these studies call for emphasis on microeconomic indicators of development, shifting away from aggregate indicators when studying changes in the development of LDCs.

Furthermore, since the World Employment Conference, held at Geneva in June 1976, the need to use indicators such as those underlying the concept of "basic needs" has been strongly emphazised. As N. Hicks and P. Streeten (1980, World Bank. Reprint Series No. 104, p. 567) put it: "The measurement of development efforts in developing countries has generally focused on the growth of GNP per head and related concepts. Increasingly, development economists have become aware that growth of output or income by themselves are not adequate indicators of development, and that the reduction of poverty and the satisfaction of basic human needs are goals that should show up in a measure of development". That is, according to the basic needs approach, it is the qualitative properties (composition) of output and who is going to benefit from the output, rather than growth rates of production or indexes of income distribution, that become the principal concern (Streeten, 1979).

In view of what has been said about the importance of

[*]Earlier studies, e.g., Kuznets' (1955) study of historical data for the developed countries, confirms the hypothesis that income inequality first increases and then decreases with development.

disaggregated analysis as a complement to the GNP based
calculations, we shall turn to such an analysis of the
relief provided in the next two chapters of this empi-
rical analysis. First we investigate the character of
the disaster relief operations, in particular to what
extent they may be considered as compensatory only and
to what extent they involve something more than pure
reconstruction or compensation. Subsequently, we des-
cribe individual relief projects indicating a large
extent of non-compensatory, development inducing effects.
In general, the procedure used in the disaggregated ana-
lyses is one where the conditions of four types of in-
dividuals are compared: 1) those who were affected by
the earthquake and received help, 2) those who were af-
fected by the earthquake but received no help, 3) those
who were unaffected by the earthquake but received help
and, 4) those who were neither affected by the earth-
quake nor helped by the disaster relief programs.

3. An Estimate of the Overall Economic Impact of the
    Disaster Relief

As previously stated, our task is to estimate the
gains in real output induced by foreign disaster re-
lief provided to Guatemala. In principle, this is
a problem of estimating area C in figure 1. This area
is determined by the actual development of production
and the trend corresponding to the hypothetical case
of autonomous development with disaster. But, as ex-
plained in detail below, a proper determination of this
area requires additional information about the total
output that would have been attained if the earthquake
had not occurred, i.e., about the autonomous develop-
ment without disaster.

On the basis of historical data for the development of
real output in Guatemala the trends in output mentioned
above will be constructed with the help of the least-
squares method. The number of years in the time series

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Figure 1: Development Path With/Without Disaster and With/Without Assistance
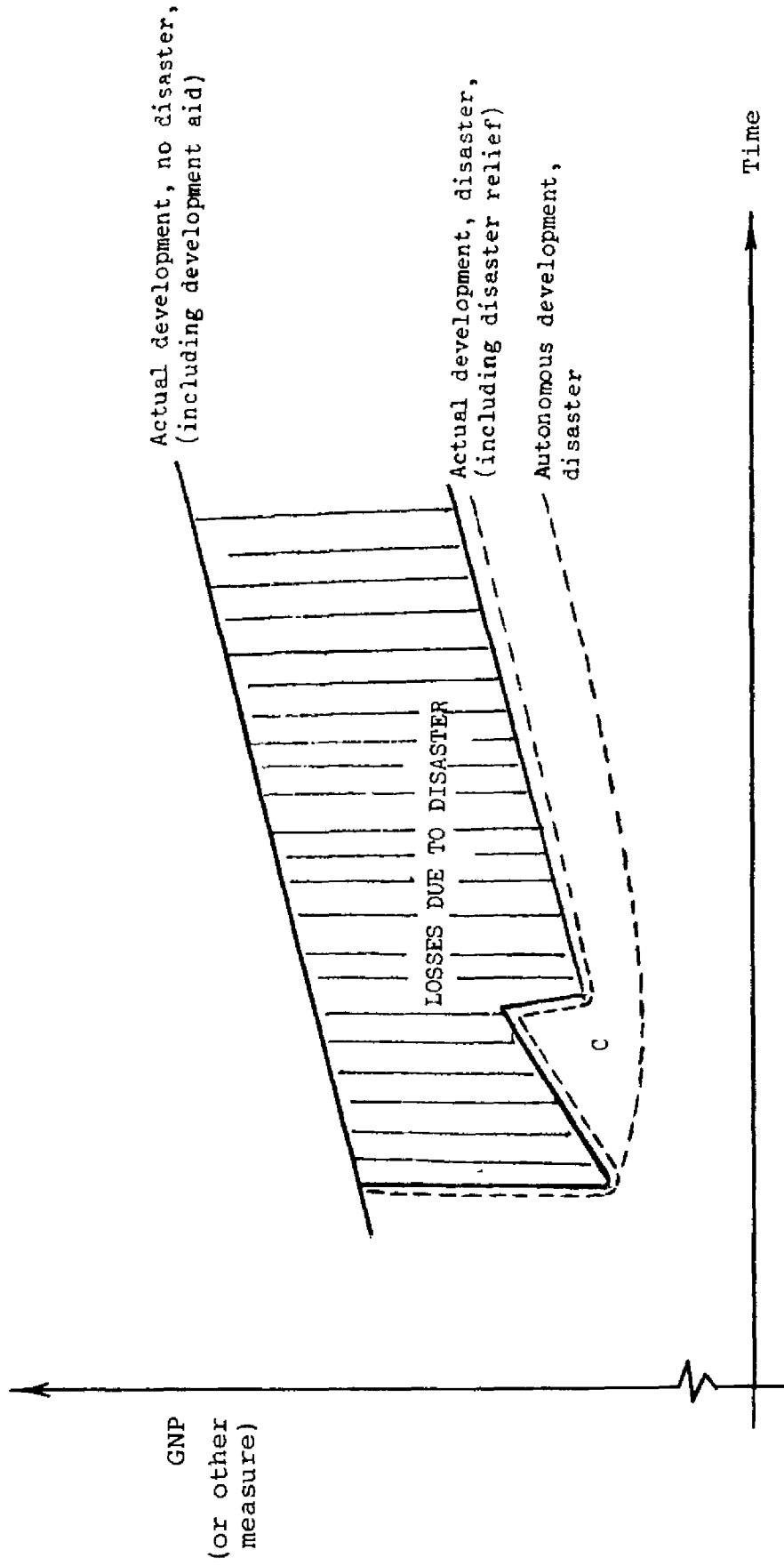
used has been determined by the information available. The Gross Domestic Product (GDP) for 1980 is the most recent data available. In the sources from which the information was taken, the values of the GDP are expressed on the basis of prices for two different years, 1970 and 1975, respectively (see, International Statistics, e.g., May 1977, pp. 188-189; November 1978, p. 166 and April 1982, p. 180, published by the International Monetary Fund). Therefore, in order to express these values on the basis of the prices for one and the same year, 1970, the series have been transformed by using the GDPs for 1975 as the linkage point, i.e.:

$$\text{GDP}_t^{70} = \frac{\text{GDP}_{75}^{70}}{\text{GDP}_{75}^{75}} \text{GDP}_t^{75} \quad ^{*)}$$

The values of the GDPs obtained in this way are represented in table 1 below.

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*) Here the superscripts represent the years taken in each series as a basis (1970 and 1975), the subscript is the linkage year (1975) and t is the year for which transformation is made. That is, for transformation we take the rate of the GDPs for the linkage year (1975) (see table 1 below) and multiply it for the GDP of the year for which transformation is desired:

$$\text{GDP}_t^{70} = \frac{2,503}{3,646} \text{GDP}_t^{75} = 0.686 \ \text{GDP}_t^{75} .$$

TABLE 1: Gross Domestic Product in Guatemala[*]
1959-1980. In millions of Quetzales (Q).
1 Q = 1 US $

Column	1	2	3	4	5
Year	GDP in 1970 prices	GDP in 1975 prices	GDP in current prices	Fitted-trend values of the GDP based on: 1959-75	1959-80
1959	1,088			1,045	1,042
1960	1,114			1,105	1,102
1961	1,162			1,167	1,165
1962	1,203			1,233	1,232
1963	1,318			1,303	1,302
1964	1,379			1,377	1,376
1965	1,439			1,455	1,455
1966	1,519			1,537	1,538
1967	1,581			1,624	1,626
1968	1,720			1,716	1,719
1969	1,801			1,813	1,817
1970	1,904		1,904	1,915	1,921
1971	2,010		1,983	2,024	2,031
1972	2,158		2,101	2,138	2,147
1973	2,304		2,569	2,259	2,270
1974	2,451		3,161	2,387	2,400
1975	2,503	3,646	3,646	2,522	2,537
1976	2,687	3,915	4,392		2,682
1977	2,897	4,221	5,560		2,835
1978	3,042	4,432	6,236		2,997
1979	3,186	4,641	6,800		3,168
1980	3,297	4,803	7,497		3,349

Source: Column 1   (1959-1975), International Statistics, May 1977, op.cit.
(1976-1980) own estimates (by transformation)

Column 2   International Statistics, April 1982, op.cit.

Column 3   Guatemala Country Economic Memorandum, 1980, World Bank February 4

Column 4 and 5   Our own estimates.

[*] GDP=GNP - net payments abroad, see International Statistics, op.cit.

4. A First Indication of Changes in the Rate of Growth of Real Output

From table 1, using the values for the GDP in 1970 prices (column 1), we first construct the trend for the development of real output corresponding to the case in which the influences of the earthquake (which occurred on February 4, 1976), the disaster relief and other factors (which might have influenced output rates during the post-disaster years) are included. Computing the exponential trend for 1959-80 (column 5) yields an estimate for the average growth rate of real output of 5.3 per cent. If in these calculations we exclude the values of the GDP for the post-disaster years 1976-1980 (column 4) the average growth rate is reduced to 5.1 per cent. Although very small, this difference in growth rates is compatible with the appearance of a new growth factor during the post-disaster years. This raises the following question, what role did the foreign disaster relief provided to Guatemala play in the process?

There are several ways in which questions like this could be answered. For example, introducing a dummy variable one could test whether the tendency to higher levels of production will hold, i.e., whether the slope of the trend changes in 1976 (which seemingly was true in this case). Alternatively, by using covariance analysis one could test whether there has been any inherent change in the structure of production of the economy since 1976 (see Johnston, 1972, pp. 192-207). The validity of this latter type of test, however, will depend, among other things, upon the degree of integration of markets and regions and the degree of homogeneity of the factors of production in the economy. As extensively discussed throughout this study, the preconditions for such a test are not likely to be favorable in the case of LDCs. In addition, we have the identification problem as well as the brevity of the period studied, already referred to and to which we shall return

shortly. Keeping this in mind, we now continue by
attempting to estimate that part of the gains in pro-
duction capacity that the foreign disaster relief may
have induced.

5. An Estimate of the Gains in Real Output Induced
   by the Disaster Relief

a) Post-disaster "actual development" of the GDP. The
"post-disaster actual development" of the GDP is repre-
sented graphically in figure 2 below. In this figure
the other trends are the same as those in columns 4 and
5, Table 1.

Figure 2 illustrates the characteristics of the post-
disaster development of production. If one looks at the
year to year variations in the actual levels of the GDP
(the points plotted around the trend) one may see that
already in 1976 - the year of the earthquake - total
output of the nation has not only recovered but even
improved. The rate of growth of real output achieved
during this year is 7.4 per cent, which is considerably
higher than the 5.1 per cent growth rate for 1959-75
and the 2.1 per cent growth rate the economy had in
1975. Moreover, the growth rates for 1976 and 1977 are
among the highest Guatemala has had.[*] That is, contrary
to what might be expected in a post-disaster situation,
Guatemala's economy expanded unusually well. This result
is still more interesting in the light of the amount of
damage caused by the earthquake. As was mentioned in chap-
ter 2 the total physical damage had been estimated as
approximately US $1.000 million (or US $630 million, in
1970 prices. See Table 7, below). This is equivalent to
nearly 30 per cent of the 1975 GDP or, 15 per cent of
the total physical assets of the nation (see Bank of
Guatemala, 1976, p. 14). These damages - assuming a re-
construction period of four years - imply that about

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[*] The mean growth rate for the entire period 1976-80 is 5.7 per
cent.

Figure 2

Post-disaster development of the GDP in Guatemala (semi-log scale)

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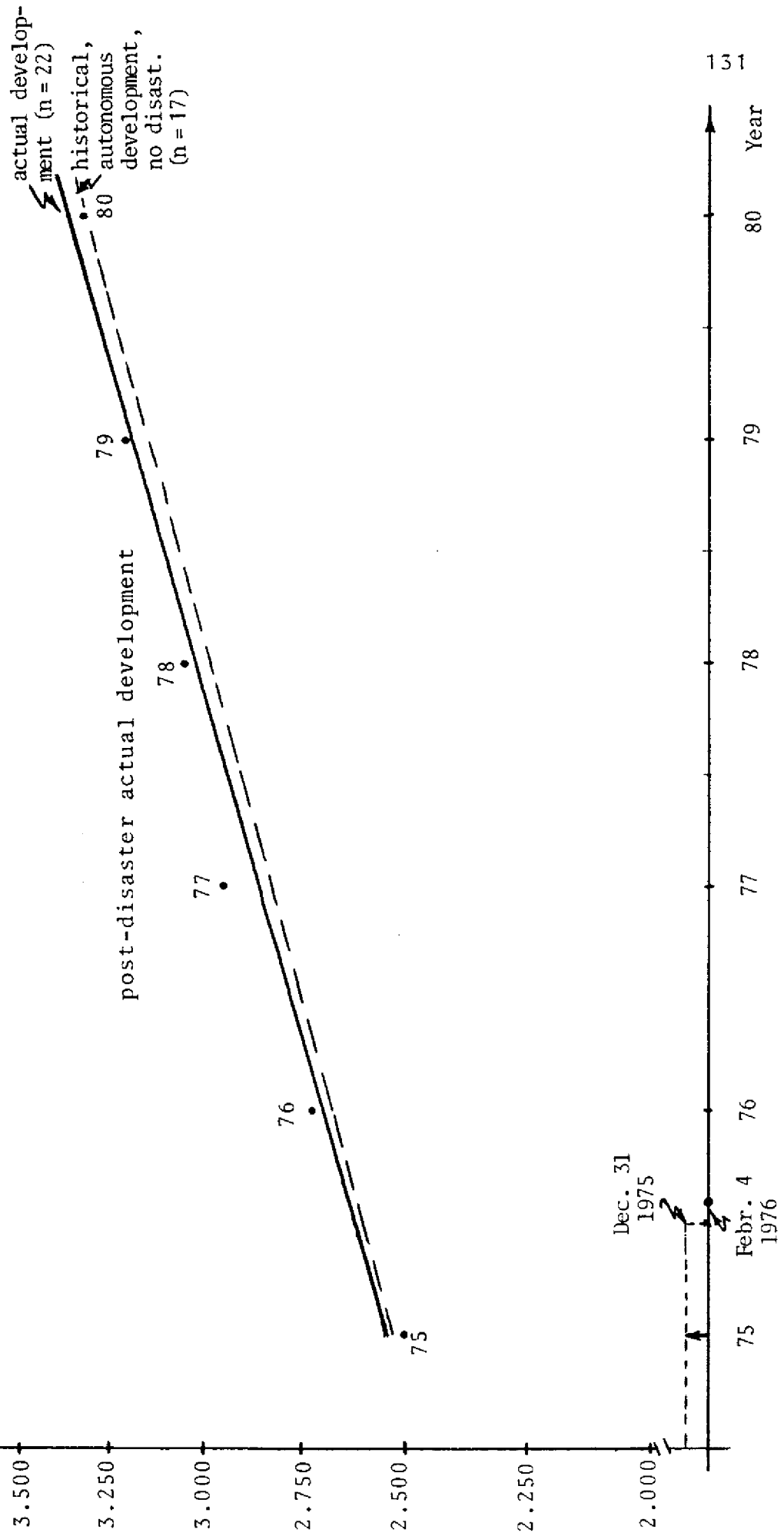
7 per cent of the GDP or 56 per cent of the private
net investments (see Chapter 2, section 4) would have
to be earmarked each year for reconstruction purposes
alone.[*] Now, to find out the role disaster relief from
abroad has played in this process we will try to identi-
fy a post-disaster trend for the GDP if no such relief
had been provided.

b) "Autonomous development" of the GDP with disaster.
With the help of a simple model (of the Harrod-Domar
type), where a fixed constant relation between total
output and the amount of physical capital is assumed,
we may calculate the levels of production that would
correspond to each level of the capital stock at each
point in time (see, e.g., Chenery, H., et al. 1974,
pp. 210-235).[**] That is:

(1) $GNP_t = \frac{1}{k} K_t$,

where K stands for the level of the capital stock in
use in the economy at time t and k is the capital-
output ratio. In that case, a path for the autonomous
development of the GNP for the post-disaster period may
be constructed as follows. Firstly, from (1) we ob-
tain:

$$\Delta GNP_t = \frac{1}{k} \Delta K_t$$

Replacing ΔK_t by the value of the total material
damage caused by the earthquake (D) and by the amount
of disaster relief provided from abroad (A), respecti-
vely, we obtain:

(2) $\quad \Delta GNP^D_{1976} = \frac{1}{k} D \quad , \quad$ for $\quad \Delta K_{1976} = D \quad$ and

(2') $\quad \Delta GNP^A_{1976} = \frac{1}{k} A \quad , \quad$ for $\quad \Delta K_{1976} = A.$ [*]

Equation (2) will provide us with an estimate of the
fall in production which would have resulted from a
reduction of the capital stock by the amount of the
estimated value of the damage caused by the earthquake.
This means that the damage values are interpreted as a
correct estimate of the net effect of the disaster on
the total productive social capital with, among other
things, a correct adjustment for depreciation of the
real capital existing prior to the earthquake.

The second equation, (2') gives an estimate of the in-
crease in GNP which the disaster relief from abroad
may have generated in 1976. This means that we inter-
pret the reported total volume of disaster relief as
net investments in real capital. As we shall return to
later in some detail, there are many more or less ob-
vious reasons why this interpretation would represent
an overestimate. To mention just one of these reasons,
part of the relief has consisted of consumer goods and
temporary relief equipment. Here, however, we assume
that this overestimate is small enough to enable us
to use the reported disaster relief volume as an approxi-
mation. [**]

Using equation (2) one may obtain an estimate for the
level of production that the economy, on its own, would
have achieved in 1976 following a destruction (D) in
its capital stock as:

(3) $\quad GNP^{*wd}_{1976} = GNP^{*nd}_{1976} - \Delta GNP^D_{1976} \quad ,$

[*] In the next section we discuss the inadequacy of using an aver-
age k for the whole economy and present alternative solutions.
[**] As will be seen in Ch.6, the major share of disaster relief in
terms of consumer goods has not been recorded and hence, is not in-
cluded in the estimates here.

where * stands for "autonomous development", wd for "with disaster" and nd for "no disaster". That is, as a basis for this calculation we take the value of the goods and services that would have been produced in Guatemala if the earthquake had not occurred (GNP^{*nd}_{1976}) which, of course, also means that there would have been no disaster relief to the nation. An estimate of this value is given by the actual value of the GDP_{1975} plus 5 per cent which is the "average growth rate" that corresponds to the historical development of production constructed earlier on the basis of the observations for 1959-75 (see Table 1). Given the level of the GDP^{*wd}_{1976} the ceteris paribus assumption implies that an approximation of the path we seek passing through this level of production will be parallel to the historical trend. Such a path will catch the effects of all the factors that, historically, have determined the development of real output in the economy but will exclude the effects of all other factors linked with the disaster of 1976 as well as such other factors that would possibly have made the development during 1976-80 significantly different from that of 1959-75. Looking for factors of the last mentioned type, we can check at least the following items:

(1) Did Guatemala's own real investments including those financed by ordinary development aid (but excluding those financed by disaster relief) increase significantly for the years 1975-79?

Available data show that the average rate of gross fixed investment[*] as a percentage of GDP increased from 12 per cent for 1963-75 to 14.5 per cent for 1976-79 (see World Bank, 1980, table 2,3, p. 42). This in-

[*] Gross Fixed Investment = Gross Domestic Investment-Change in Stocks.

crease, it should be noted, includes investments financed by foreign disaster relief. Looking at the composition of investments in table 4, however, we can see that the major share of the increase was in public investments (construction of roads and infrastructures) and private construction. This share stands for 92 per cent of the total US $82 million annual increase in investments during the 1976-79 period. If most of the increase in investments for construction aimed (as it surely did) at repairing the damage caused by the earthquake, these observations indicate that very little went to increasing the production capacity (new investments) of the nation. In fact, repair costs may very well have exceeded the US $82 million annual increase in investments. Moreover, they would have had to equal some US $250 million per year to rebuild during 1976-79 what was damaged in 1976 according to the official estimates. At any rate, we may conclude that a significant increase in the amount of own net real investments did not occur in Guatemala during 1976-79.

(2) Did Guatemala's export volume and export prices increase significantly during the 1976-79 period?

Available data show that there were some changes for the major export products of Guatemala, i.e., coffee, cotton and sugar, and tourism (World Bank, 1980, pp. 5-14; Bank of Guatemala, 1980, pp. 44-45 and 53). For coffee, the average price received increased from about 55 cents per pound in 1975 to nearly US $2 per pound during 1976-77, while the export volume did not change significantly. Cotton prices nearly doubled 1976-77, as compared to 1975, and then stayed at that level up to 1979. Also in this case the export volume remained more or less the same. Sugar export prices declined during 1976-77 to less than one half, and the export volume to one third, of their levels in 1975. Finally, as compared to the 1975 level, tourist arrivals de-

clined with 10 per cent in 1976, increased to close to
the 1975 level in 1977, fell back again with 6 per cent
during 1978 and increased somewhat during 1979. These
changes should be seen in the light of an average rate
of growth of about 20 per cent per year that tourism
to Guatemala had during the 1970-75 period (World Bank,
1980, p. 12).

Historically, Guatemalan economic growth has shown a
close correlation with export performance. That is to
say, "economic activity (in Guatemala) accelerates in
times of high export earnings" (World Bank, 1980, p.16).
But, even if merchandise export earnings nearly doubled
from 1976 to 1977, the increases in the prices for coffee
and cotton seem to have been more than neutralized by
the fall in sugar prices and the reduced volume for sugar
and tourism for the entire 1976-79 period. As a matter of
fact, for the export sector as a whole the average an-
nual growth rate of its real value during 1976-79 is
about 5.6 per cent (estimated on the basis of Bank of
Guatemala, 1980, table 52). This rate is lower than the
7.2 per cent of average annual increase during 1963-75
(see Table 3). This seems to indicate that the changes
in export prices and export volume worsened rather than
improved the conditions for growth in Guatemala.

We have now attempted to identify investments and ex-
port value changes major growth factors for the Guate-
malan economy in addition to the potential effects of
disaster relief. Except for the fact that the Govern-
ment had planned to increase real growth rates of pro-
duction during 1976-79 (see chapter 2, table 1), and
this may have resulted not only in desires but also in
actual measures, e.g., in the form of increased net
investment, we have not been able to pin down any
change in these growth factors that would have made
the 1976-79 period significantly different from the pre-
disaster years for which data are available. Thus, we
will assume for the time being that these "other" fac-

tors on balance neither increased nor reduced the growth rate for the post-disaster period as compared to the predisaster period. This assumption does not mean, however, that we rule out that there may have been yet other, more special growth factors that are only possible to identify in a detailed, disaggregate analysis of Guatemala's economic development from 1959 to 1980. As already indicated, no such analysis seems to be available.

If instead of taking the value of the material damage (D) and the value of the GNP in the hypothetical case that the disaster had not occurred, we take the value of the disaster relief provided from abroad (A) and the actual value of the GNP for 1976 and, apply expression (2') we will obtain:

$$(4) \quad GNP^{ndr}_{1976} = GNP_{1976} - \Delta GNP^{A}_{1976} \, ,$$

where ndr stands for "no disaster relief".

This estimate is an approximation of the level that the GNP might have had in 1976 in the absence of disaster relief, but including the possible influences of the factors other than relief mentioned a moment ago.
As the disaster relief continued beyond 1976, we would have to make continuous adjustment of this kind, providing us with the development path in the absence of disaster relief. As we shall explain in more detail below, this path can be regarded as the maximum development possible in absence of disaster relief.

There is a weakness in the methods described above that connected with the well-known problems concerning the use of capital output ratios (see Chenery, H. and Ahluwalis, M., op.cit. pp. 212-215; Myrdal, G., 1970, Chapter 15, App. 2-II). These ratios are influenced by rates and patterns of growth, technical innovations,

changes in relative prices, differences in factor pro-
ductivities among sectors that will differ even re-
gionally in LDCs and limit the validity of the esti-
mations obtained on the basis of aggregated national
values of k. Measuring changes in the levels of total
output generated by factors exogenous to the system,
such as the destruction of capital assets or the pro-
vision of disaster relief from abroad requires that
sectoral and regional differences in factor producti-
vity be considered. In addition, natural disasters
strike regions and sectors unevenly, and disaster relief
does not reach all those affected in equal measure.
Therefore, to improve our estimations we will make an
attempt to take account of different $\underline{k}$'s in different
sectors of the Guatemala's economy.

To obtain the capital-output ratios we need we should
compare the changes in the capital stock (net invest-
ments) for the different sectors. For a detailed descrip-
tion of appropriate methods see, e.g., Chenery, H.,
Eckstein, P., 1970. We have found data for Guatemala
on changes in the GDP by sector of origin (see table
2 and on the aggregate annual capital formation (table
3) but not for changes in the levels of net investments
for the same sectors. Therefore, no direct calculations
of the k's we need have been possible. When the lack of
information about the $\underline{k}$'s limits the possibilities of
making the desired estimations it appears to be cus-
tomary to use estimates for countries with similarities
in their economic structure (see Watanabe, 1975, Econo-
my Wide Models and Development Planning, World Bank).
Here, we shall use the $\underline{k}$'s available for Kenya, assuming
that the characteristics of Kenya's economy are suffi-
ciently similar to those of Guatemala. The sectoral clas-
sification used by the World Bank (see tables 5 and 6)
coincides almost completely with that used by the Bank
of Guatemala in table 2. One difference is that services
in table 2 are more disaggregated than in table 5.

Furthermore, we find that the sectoral distribution of
the GDP in Kenya is quite similar to that in Guatemala.
For example, during 1976 in Guatemala industry accounted
for about 19 per cent, services for 54 per cent and
agriculture for 27 per cent of the GDP, respectively
(see table 8).[*] The corresponding distribution during
1976 in Kenya was 20 per cent for industry, 45 per cent
for services and 35 per cent for agriculture (World
Bank, 1979 Report, table 3).

[*] Industry includes: mining, manufacturing and construction. Ser-
vices includes: public utilities, transport and storage, commerce,
banking insurance and finance, housing, public administration and
defense and personal services.

Table 2

GROSS DOMESTIC PRODUCT BY SECTOR

(1958 Market Prices, 1963 – 1975)

(thousand of Quetzales)

Sector*)	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
GROSS DOMESTIC PRODUCTS	1 241 064	1 298 557	1 355 156	1 429 923	1 488 609	1 619 203	1 695 892	1 792 753	1 892 831	2 031 552	2 169 378	2 307 675	2 352 750
1. Agriculture	383 478	384 762	389 361	407 684	408 133	452 242	462 918	489 677	524 279	574 687	605 124	643 756	659 874
2. Mining	1 541	1 588	1 634	1 817	1 818	1 347	1 371	1 676	1 736	1 515	1 624	1 990	2 136
3. Manufacturing	165 912	176 386	190 838	210 739	228 447	254 819	273 292	282 949	303 165	319 786	345 825	361 633	356 326
4. Construction	19 760	25 032	24 499	26 563	29 285	27 628	28 516	28 370	28 495	34 200	40 774	38 032	43 898
5. Public utilities	11 179	12 182	14 050	15 864	16 732	18 320	20 143	21 544	22 747	25 705	28 318	30 414	32 930
6. Transport & Storage	59 324	66 738	73 765	75 504	78 095	85 258	91 953	98 182	105 520	118 242	130 482	147 469	150 783
7. Commerce	335 724	356 092	376 575	397 202	417 623	461 527	480 617	518 004	542 059	569 639	609 106	655 515	643 695
8. Banking, Insurance & Fin.	28 925	32 405	32 676	33 357	35 003	36 215	38 242	42 294	43 634	46 644	53 310	57 699	61 291
9. Housing	101 562	104 238	107 603	111 457	114 921	118 253	121 786	124 802	127 430	129 934	132 373	134 850	138 703
10. Public Admin. & Defence	61 207	63 103	65 142	66 781	72 209	73 325	82 599	86 930	88 100	97 502	99 817	106 390	118 189
11. Personal Services	72 452	76 031	79 013	82 955	86 343	90 269	94 455	98 325	105 666	113 698	122 625	129 857	140 020

Source: Bank of Guatemala

*)Primary Production = sectors 1 and 2
Secondary Production = sectors 3 to 5
Services = sectors 6 to 11.