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AN EMPIRICAL EXAMINATION OF W. W. ROSTOW'S

HISTORICAL STAGES OF ECONOMIC DEVELOPMENT

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AN EMPIRICAL EXAMINATION OF W. W. ROSTOW'S

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AN EMPIRICAL EXAMINATION OF W. W. ROSTOW'S

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CHAPTER I

INTRODUCTION

Purpose

The purpose of this study is to examine empirically several of the key statements in Professor W. W. Rostow's historical stages theory of economic development. The present study differs from similar studies in the method and in the data it uses to examine these aspects of Rostow's theory.

In the past, the approach taken by Professor Simon Kuznets of Harvard University, and others, in empirically examining Rostow's historical stages theory was to work with time series data for various countries covering long periods of time. This approach has the decided advantage of being the most straightforward method of examining Rostow's theory, but it possesses three drawbacks: first, the necessary long-term time series are available, with the exception of Japan, for only a few presently developed "Western" nations; second, such data seldom extend far enough back in time to cover

the emergence of these countries into Professor Rostow's
crucial take-off stage; and, third, the data available
for the earliest time periods--which are the most
critical ones in terms of examining Professor Rostow's
important take-off concept--are of limited reliability.
Thus, Kuznets states that "the evidence . . . is not
conclusive," but it does not seem to "support Professor
Rostow's distinction and characterization of the take-
off stage."[1]

Although some difficulties are associated with
the empirical approach of the present study, the gen-
eral results obtained seem to cast additional light
on Rostow's theory, and on his take-off stage in par-
ticular.

The Importance of Additional Work in This Area

A number of economists have made statements
emphasizing the value of additional work in this area.
According to Professor Everett E. Hagen, "The concept
of a succession of stages is useful only if each stage
is characterized by a set of empirically testable qual-
ities. . . ."[2]   Similarly, Professor Kuznets, in discussing

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[1]Simon Kuznets, Economic Growth and Structure:
Selected Essays (New York: W. W. Norton & Company,
1965), p. 232.

[2]Everett E. Hagen, On the Theory of Social
Change: How Economic Growth Begins (Homewood, Illinois:
Dorsey Press, 1967), p. 514.

the characteristics of a good historical stages theory of economic development, says, "Any specific stage must display empirically testable characteristics, common to all or to an important group of units experiencing modern economic growth."[3]

Kuznets concluded his empirical study of Rostow's historical stages theory by saying, ". . . the evidence used to test Professor Rostow's scheme is not conclusive . . . quantitative evidence, and much of it must be quantitative, is not available for some of the take-off periods suggested by Professor Rostow."[4]

Professor Kant in, "Rostow's Take-Off: An Appraisal," suggests that, ". . . an empirical approach . . . would have enabled us to make a better assessment."[5]

Scope

The present study consists of two major divisions. The first is a survey of the literature surrounding Professor Rostow's historical stages theory, which is intended as a background to show where the present study fits in relation to other work in this area.

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[3]Kuznets, p. 215.

[4]Ibid., pp. 219 and 232.

[5]M. Kant, "Rostow's Take-Off: An Appraisal," Indian Journal of Economics, Vol. XLIII (July, 1962), p. 32.

The second reports the procedure and results
of the present empirical study. In this section pri-
mary emphasis is given to several of Professor Rostow's
key statements concerning the take-off stage. Also
included, but given less emphasis, is an examination
of several other elements in Professor Rostow's theory.

Method of Approach

Rostow's take-off stage is generally understood
to be a period of about twenty years. United Nations
time series data are now available for some of the
countries in the world for a period of seventeen years,
or the greater part of the time required for Professor
Rostow's take-off stage to occur. The approach of the
current study has been to use these newly available
United Nations data in examining Rostow's historical
stages theory.

In general, the method used in the present
study has been to carry out a time series analysis
using these seventeen year spans (or shorter spans
in some cases) of available data for the countries
selected for examination. The sample countries were
ranked according to level of economic development, and
their time series characteristics examined on a cross
sectional basis.

Selection of Countries

The countries examined in this study consist,
insofar as the availability of data permit, of those
discussed in, "On the Measurement of Economic Devel-
opment Using Scalogram Analysis," by Magdi M. El-
Kammash.[6]

In El-Kammash's article, 49 countries were
ranked according to level of economic development
based on four variables: 1) infant mortality rates,
2) degree of illiteracy, 3) gross capital formation
as a percentage of gross national product in 1955, and
4) share of the agricultural sector (agriculture,
forestry and fishing) in gross domestic product in
1955.[7] Using these four variables, countries were
grouped into five successive categories of economic
development, "based on the total scores of scaling,"
the ordering of countries within each category being
based on per capita national product averaged over
the years 1952-1954.[8]

According to United Nations population estimates

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[6]Magdi M. El-Kammash, "On the Measurement of
Economic Development Using Scalogram Analysis," Papers
and Proceedings of the Regional Science Association,
Vol. XI (1963), pp. 309-334.

[7]Ibid., pp. 316-317.

[8]Ibid., p. 321.

for 1967, El-Kammash's 49 country sample contains

approximately 53 per cent of the world's population,

while the 46 of these countries examined in Chapter VI

and the 47 of these countries examined in Chapter VII

of the present study account for approximately 37

percent of the world's population.[9]

The Data

The primary source of data for the present study

consisted of various issues of the United Nations Year-

book of National Accounts Statistics issued since

World War II. Complete data for all the countries in

the world were not available, but enough data were

available to indicate general patterns for the majority

of the countries in the world.

In general, "gross" national accounts data were

used in the present study rather than "net" national

accounts data because of greater reliability and avail-

ability.

Specific Points Examined

According to Rostow, two necessary requirements

which must be fulfilled in order for the take-off stage

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[9]Calculated using data from, United Nations,
Demographic Yearbook, 1967 (New York: Statistical
Office of the United Nations, 1968).

to occur in a given country are the following:

> *) a rise in the rate of productive investment
>   from, say, 5% or less to over 10% of national
>   income (or net national product (NNP)).
>
> *) the existence or quick emergence of a poli-
>   tical, social and institutional framework
>   which exploits the impulses to expansion
>   in the modern sector and the potential
>   external economy effects of the take-off
>   and gives to growth an on-going character.[10]

The first of these two statements may be interpreted as requiring a rapid (considering the briefness of the take-off stage) increase in investment as a percentage of national product for a nation's economy. The second statement, dealing with the "quick emergence of a political, social and institutional framework which exploits the impulses to expansion in the modern sector," is interpreted broadly in the present study. From the standpoint of economic theory, these factors constitute what might be called the "public goods" sector. The present study examines this concept by looking at the rate of increase in size of the government sector as a percentage of a nation's economy for each of the sample countries. Although available data for the government sector do not precisely encompass all of the factors making up the

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[10] W. W. Rostow, <u>The Stages of Economic Growth</u>: <u>A Non-Communist Manifesto</u> (Cambridge: Cambridge University Press, 1960), p. 39.

public goods sector, these data are the most readily
available and reliable, and are felt to be highly
correlated with the concept being examined.

The present study examines the above two state-
ments by looking at trends for the sample countries in
"Gross Domestic Fixed Capital Formation as a Percentage
of Gross Domestic Product" and "Government Consumption
Expenditure as a Percentage of Gross Domestic Product,"
respectively, over the seventeen year span. The
hypothesis examined is that, in reference to the take-
off stage, a "cluster" of countries at the lower, less-
developed end of Professor El-Kammash's ranking of
countries will exhibit these two characteristics of
Professor Rostow's take-off stage.

Another point examined is Professor Rostow's
statement that, during the drive-to-maturity stage,
"some 10-20% of the national income is steadily
invested. . . ."[11] This statement is examined by
analyzing the trend in "Gross Domestic Fixed Capital
Formation as a Percentage of Gross Domestic Product."

Finally, the present study follows a line of
research suggested in Professor Kuznets' writings, by
examining the rural and urban population aspects asso-
ciated with economic development for the sample coun-
tries examined in the present study.

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[11]Ibid., p. 9.

PART II

PROFESSOR ROSTOW'S HISTORICAL STAGES THEORY

AND PREVIOUS WORK EXAMINING IT

CHAPTER II

SUMMARY OF W. W. ROSTOW'S HISTORICAL STAGES

THEORY OF ECONOMIC DEVELOPMENT

Introduction

The version of Professor Rostow's historical

stages theory summarized here is the one presented in

his book, The Stages of Economic Growth: A Non-

Communist Manifesto.[1] Although Professor Rostow's

theory exists in slightly differing versions in earlier

writings and journal articles, the version presented

in his book is of a more "mature" form and is perhaps

the most widely disseminated version of this theory.[2]

Professor Rostow is only one of a succession

of people who have created historical stages theories

of economic development. A range of historical stages

theories can be found which go "back at least two

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[1]W. W. Rostow, The Stages of Economic Growth:
A Non-Communist Manifesto (Cambridge: Cambridge Uni-
versity Press, 1960).

[2]See, for example: W. W. Rostow, "The Take-
Off into Self-Sustained Growth," Economic Journal,
Vol. LXVI, No. 261 (March, 1956), pp. 25-48.

centuries, even if no account is taken of the specula-

tions on the development from the 'natural state' so

prevalent in the writings during the whole Enlighten-

ment era and in amplified form presented by Adam Smith

in his <u>Wealth of Nations</u>."[3]

The common aim of these theories is to design

a model of the historical process of economic develop-

ment by specifying and isolating a limited number of

factors which characterize and identify the different

stages.

> Such models are illuminating and justifiable if
> they identify genuine key variables and reveal
> otherwise unexpected relationships. Their suita-
> bility for prediction is especially significant.
> Most models implicitly or explicitly claim to
> explain or predict through postulated changes in
> the key variables. These changes are in turn
> derived either from <u>a priori</u> reasoning, or on
> the basis of empirical data. Without the speci-
> fied changes, development from one stage to
> another will not occur, or will occur only
> exceptionally. If a model can successfully
> identify the key variables and significant changes
> in them, then a powerful tool of explanation and
> prediction will have been forged.
>
> Professor Rostow's widely acclaimed book,
> <u>The Stages of Economic Growth</u>, attempts to identify
> the key variables in the process of world economic
> history and the resulting stages of economic growth;
> and he claims that these both explain the course
> of economic history and yield predictions for the

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[3]Gunnar Myrdal, "The Theories of 'Stages of
Growth,'" <u>Scandinavian Economic History Review</u>, Vol. XV,
Nos. 1 & 2 (1967), p. 2.

future which in turn can serve as bases for far-reaching policies.[4]

The novel feature of Professor Rostow's historical stages theory is "the notion that first there is a period when the conditions for growth are established, then one or two or three decades within which certain distinctive and necessary transitional events begin and are completed, and thereafter self-sustained continuing growth. An airplane leaves the ground in such a sequence. . . ."[5]

Previous Historical Stages Theories

"Historians and philosophers have for long been attracted by the possibility of expressing the historical process as a sequence of stages instead of a simple chronological arrangement."[6] Adam Smith used a sequence of hunting, pastoral, agricultural, commercial, and manufacturing stages.[7] Frederich List felt that each nation passes through five stages which he

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[4]P. T. Bauer and Charles Wilson, "The Stages of Growth," Economica, New Series, Vol. 29 (May, 1962), p. 190.

[5]Everett E. Hagen, On the Theory of Social Change: How Economic Growth Begins (Homewood, Illinois: Dorsey Press, 1967), p. 516.

[6]Ibid.

[7]Jacob Oser, The Evolution of Economic Thought (New York: Harcourt, Brace & World, 1963), p. 365.

termed: original barbarism, pastoral condition, agri-
cultural condition, agricultural manufacturing condi-
tion, and agricultural manufacturing commercial condi-
tion.[8]

Karl Marx's famous pattern of stages had soci-
ety evolving "from primitive communism to slavery,
feudalism, capitalism, socialism, and communism."[9]
Werner Sombart divided man's history into three stages
depending on the degree of social interaction: the
individual economy, the transitional economy, and the
social economy.[10]

Bruno Hildebrand built on the ideas of Frederich
List, feeling that List generalized too much from what
had occurred in Britain.[11] Hildebrand's scheme con-
sisted of: an exchange economy, a money economy, and
a credit economy.[12] Karl Bucher, a later economist,
developed a view of historical economic development
containing three stages in which he synthesized
the ideas of many previous economists, such as

[8]Alexander Gray, The Development of Economic
Doctrine (New York: John Wiley & Sons, 1965), p. 218.

[9]Oser, p. 365.

[10]Ibid.

[11]Stephen Enke, Economics for Development (Engle-
wood Cliffs, N. J.: Prentice-Hall, 1964), p. 193.

[12]Joseph A. Schumpeter, History of Economic Analy-
sis (New York: Oxford University Press, 1966), p. 442.

List and Hildebrand.[13] "Bucher discussed in a series

of essays the evolution of the 'household economy' of

antiquity into the 'town economy' of the late Middle

Ages, and thereafter into the 'natural economy' of

modern times."[14]

Professor Rostow's Stages

In Professor Rostow's book, The Stages of Eco-

nomic Growth: A Non-Communist Manifesto, five stages-

of-growth are presented as a means of generalizing the

economic development of nations. Also, Professor

Rostow contends that these stages-of-growth "consti-

tute an alternative to Karl Marx's theory of modern

history."[15]

According to Professor Rostow, it is possible

to classify all societies, at least in their economic

dimensions, as lying within one of the following five

stages-of-growth categories: the "Traditional Soci-

ety," the "Preconditions for Take-Off," the "Take-

Off," the "Drive to Maturity," and the "Age of High

Mass-Consumption."

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[13]Enke, p. 193.

[14]Bauer and Wilson, p. 190.

[15]Rostow, The Stages of Economic Growth,
p. 2.

The Traditional Society

Professor Rostow's first stage, the "traditional society," serves chiefly as a base line for his other stages.[16] According to Professor Rostow, "a traditional society is one whose structure is developed within limited production functions, based on pre-Newtonian science and technology, and on pre-Newtonian attitudes towards the physical world. Newton is here used as a symbol for the watershed in history when men came widely to believe that the external world was subject to a few knowable laws, and was systematically capable of productive manipulation."[17]

An important feature of the traditional society is that a ceiling exists on the attainable level of output per head--this ceiling results from the fact that modern science and technology are either not available or not regularly and systematically applied. Thus, a traditional society is one which remains unmoved or untouched by man's capability for manipulating his environment to his economic advantage. Generally, traditional societies, because of a low level of

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[16]Goran Ohlin, "Reflections on the Rostow Doctrine," Economic Development and Cultural Change, Vol. IX, No. 4 (July, 1961), p. 649.

[17]Rostow, The Stages of Economic Growth, p. 4.

productivity, have to devote a high proportion of their resources to agriculture (usually 75 per cent or more of the working force is engaged in agriculture). Also, arising from the agricultural system is a hierarchical social structure with very little freedom for vertical mobility.[18]

The traditional society is one within which change can take place, but the change is such that in one way or another it is assimilated "so that no cumulative irreversible renovation of society occurs."[19] In the traditional society, "the level of productivity is limited by the absence of modern science; men do not think systematically about the natural world, or do not apply their discoveries."[20] Thus, in the traditional society, "an almost unchanging technology places a ceiling on the level of attainable output per head."[21]

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[18]Ibid., pp. 4, 5, & 18.

[19]S. G. Checkland, "Theories of Economic and Social Evolution: The Rostow Challenge," _Scottish Journal of Political Economy_, Vol. VII, No. 3 (November, 1960), p. 170.

[20]Ibid.

[21]A. K. Cairncross, "The Stages of Economic Growth," _Economic History Review_, Second Series, Vol. XIII, No. 3 (April, 1961), p. 452.

The Preconditions for Take-Off

The "preconditions for take-off" is a transitional stage during which "a society prepares itself --or is prepared by external forces--for sustained growth."[22] This is a period during which a traditional society begins to become transformed in ways which enable it to "exploit the fruits of modern science, to fend off diminishing returns, and . . . enjoy the blessings and choices opened up by the march of compound interest [In this context "compound interest" is a shorthand way of suggesting that growth normally proceeds by geometric progression, much in the manner of a savings account if the interest is left to accumulate.] ."[23]

During the preconditions period, the idea spreads that economic progress is not only possible, but also that economic progress is a necessary condition for some other purpose judged to be good--such as "national dignity," "private profit," "the general welfare," or "a better life for the children." New types of enterprising men become evident--men willing to mobilize savings and to take risks in pursuit of profit. These men come to be present in the private

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[22]Rostow, The Stages of Economic Growth, p. 17.

[23]Ibid., p. 6.

economy, in government, or in both. Banks and other
institutions for utilizing capital appear. Investment
increases, especially in the fields of transportation,
communications, and raw materials. Here and there,
modern manufacturing enterprises appear using new
methods, and the scope of commerce, both internal
and external, widens.[24]

In the period of transition between the tradi-
tional society and the take-off, often the political
element is of decisive importance. Politically, the
building of an effective centralized national state--
on the basis of coalitions touched with a new nation-
alism, in opposition to the colonial power--is a
decisive aspect of the preconditions period; and it is
"almost universally, a necessary condition for take-
off."[25] A "reactive nationalism" crystallizing around
an accumulating resentment of colonial rule is often
a uniting force which transcends regional ties. In
the end, local coalitions emerge which sometimes
generate sufficient political and military pressures
to force the withdrawal of the colonial power.

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[24]_Ibid._, pp. 6-7.

[25]_Ibid._, p. 7.

The Take-Off

Professor Rostow's "take-off" stage in a nation's growth has been compared to the "critical speed" which an airplane must reach before it can "get off the ground."[26] "The picture suggested is that of the sequence involved in putting an airplane (or a glider) into flight. First there are the checking and fueling, which provide the pre-conditions [stage], then there is the relatively brief take-off, when the driving force is accelerated to produce the upward movement . . . [and] . . . self-sustained flight."[27]

The take-off stage in a nation's economic growth is a stage when the forces working for economic progress, that had previously yielded limited bursts of modern activity in certain sectors of the economy during the preconditions stage, expand and come to dominate the society; in effect, economic growth becomes the "normal condition" of the economy.[28]

The take-off is interpreted by most development

[26]Paul A. Samuelson, _Economics: An Introductory Analysis_ (Seventh Edition; New York: McGraw-Hill Book Company, 1967), p. 743.

[27]Simon Kuznets, _Economic Growth and Structure: Selected Essays_ (New York: W. W. Norton & Company, 1965), p. 227.

[28]Rostow, _The Stages of Economic Growth_, p. 7.

economists as a relatively short period of time,
"lasting not more than two or three decades, during
which a series of events combine to ensure that per
capita income will in the future rise regularly almost
every year."[29]

Quite often the beginning of a take-off can
be traced to a particular sharp stimulus. It may
come about through a technological innovation (includ-
ing a transport innovation) "which sets in motion a
chain of secondary expansion in modern sectors and
has powerful potential external economy effects which
the society exploits."[30] Also, it may take the form
of "a sharp relative rise in export prices and/or
large new capital imports, as in the case of the United
States from the late 1840's."[31]

According to Professor Rostow's definition,
all three of the following related conditions must be
present in order for the take-off stage to occur:

(1) a rise in the rate of productive investment
from, say, 5% or less to over 10% of national
income (or net national product (NNP));

(2) the development of one or more substantial
manufacturing sectors, with a high rate of growth;

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[29]Enke, p. 197.

[30]Rostow, <u>The Stages of Economic Growth</u>,
pp. 36-37.

[31]<u>Ibid.</u>, p. 37.

(3) the existence or quick emergence of a political, social and institutional framework which exploits the impulses to expansion in the modern sector and the potential external economy effects of the take-off and gives to growth an on-going character.[32]

The take-off stage is perhaps the most crucial part of Professor Rostow's historical stages theory and is a "great watershed, in which sustained growth becomes a normal condition and is carried by a few rapidly expanding sectors."[33] Perhaps one of the most important changes required for the take-off stage to occur is "a rise in the rate of investment to a level which regularly, substantially and perceptibly outstrips population growth."[34]

The Drive to Maturity

During Professor Rostow's "drive to maturity" stage the economy of a country "demonstrates the capacity to move beyond the original industries which powered its take-off and to absorb and to apply efficiently over a very wide range of its resources--if not the whole range--the most advanced fruits of (then)

[32]Ibid., p. 39.

[33]Ohlin, p. 649.

[34]Cairncross, p. 452; and Rostow, The Stages of Economic Growth, p. 21.

modern technology."[35] When a nation is in this stage

it finds a place in the international economy, and

goods which were formerly imported are, or can be,

produced at home. In other words, "this is the stage

in which an economy demonstrates that it has the tech-

nological and entrepreneurial skills to produce not

everything, but anything that it chooses to produce."[36]

Usually about sixty years after the take-off

begins--say, perhaps forty years after the end of the

take-off--what might be termed "maturity" is attained.

The economy, which was focused during the take-off

around relatively few industries, extends its range

into "more refined and technologically often more

complex processes."[37] During the drive to maturity,

then, "modern technology is extended to the whole

range of economic activity."[38]

"New methods and outlooks spread through the

whole economy [during the drive to maturity]. Incomes

for many people will increase, but the gains of most

citizens in consumable goods will not be great until

maturity is well advanced."[39]

[35]Rostow, The Stages of Economic Growth, p. 10.

[36]Ibid.

[37]Ibid., p. 9.

[38]Ohlin, p. 649.

[39]Checkland, p. 170.

In terms of sectoral development during the drive to maturity, the industrial process becomes more differentiated, with new leading sectors rising to supplant the older leading sectors of the take-off, and "deceleration" has increasingly slowed the pace of expansion of the older sectors.[40]

The Age of High Mass-Consumption

The stage of "high mass-consumption" was reached by the United States in the 1920's. In Great Britain it began in the 1930's, and on the western European continent it was a feature of the 1950's.[41] As nations have reached this stage, two things have happened: real income per head has risen to a point where a large number of persons have gained a command over a level of consumption which transcends basic food, shelter, and clothing needs; and the structure of the working force has changed in ways which have increased not only the proportion of urban to total population, but also the proportion of the population working in offices or in skilled factory jobs.[42]

The stage of high mass-consumption is characterized

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[40]Rostow, _The Stages of Economic Growth_, p. 59.

[41]Enke, p. 201.

[42]Rostow, _The Stages of Economic Growth_, p. 10.

by the automobile, a movement to suburbia, and an increased use of "durable" consumers' goods.[43] In this stage the leading sectors of the economy are oriented more towards the production of durable consumers' goods than previously; and, according to Professor Rostow, this is a phase from which the United States is just beginning to emerge.[44]

In addition to these economic changes, a society in the stage of high mass-consumption ceases "to accept the further extension of modern technology as an overriding objective."[45]

In the age of high mass-consumption, when a nation has a modernized and differentiated industrial machine, the nation's leaders are confronted with the challenge of choosing among three great objectives:

> They may seek to extend their external power and influence, using the new plenty as the basis of aggression, either regionally against their neighbours or in a bid for hegemony.
>
> Secondly, they may choose to promote social welfare, making greater provision for social security, reducing the working day, promoting a more equal distribution of incomes and manipulating the economy to promote chosen social ends even where this might involve a decline in the total product or at least a lesser rate of growth.

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[43]Enke, p. 201.

[44]Rostow, _The Stages of Economic Growth_, p. 10.

[45]_Ibid._, p. 11.

Thirdly, the rulers concerned may prefer that
society should enter upon the full enjoyment of
high mass consumption with a minimum of inter-
vention from them.[46]

In actual practice, various societies choose different

combinations of these three alternatives.[47]

Perhaps the key distinguishing characteristic

of the age of high mass-consumption is that, "the

leading sectors [of the economy] shift towards durable

consumers' goods and services."[48]

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[46]Checkland, p. 171.

[47]Ibid.

[48]Rostow, The Stages of Economic Growth, p. 10;
and Ohlin, p. 649.

CHAPTER III

NONEMPIRICAL APPRAISALS OF PROFESSOR

ROSTOW'S THEORY

Introduction

Professor W. W. Rostow's historical stages
theory stimulated a great deal of controversy and
discussion in the early 1960's after the publication
of his book, The Stages of Economic Growth: A Non-
Communist Manifesto.[1] As a reflection of the wide-
spread interest at the time, his theory served as the
central topic for several international conferences--
such as the International Economic Association's con-
ference held in Konstanz, Germany in 1960, and the
First International Conference of Economic History
held in Stockholm, Sweden in 1960.

Summarized here are a number of the comments
and appraisals which have been made concerning Professor
Rostow's theory. Where several different individuals

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[1]W. W. Rostow, The Stages of Economic Growth:
A Non-Communist Manifesto (Cambridge: Cambridge Uni-
versity Press, 1960).

have made similar comments, these comments have been

mentioned only once, unless they differ in some

important respect. The journal articles and books

dealt with here are by no means the only ones extant

which pertain to Rostow's historical stages theory,

but they are ones chosen because they are representa-

tive of the body of literature in this area. Contained

in the present chapter are appraisals of Rostow's

theory which are generally of a nonempirical nature,

while in the next chapter the comments of Professor

Simon Kuznets and several others are included along

with summaries of the empirical studies they have con-

ducted relating to Rostow's theory.

Professor Rostow, like any other individual

who has attempted to formulate a general theory, was

faced with the problem of making his historical stages

theory general enough to be relevant to a number of

nations, yet specific enough to be of value when

applied to a particular nation. Of necessity, any

general theory such as this must be a compromise;

and, as such, it becomes vulnerable to a wide range

of criticism. Many criticisms of Rostow's theory

center on comments that it is "over-simplified,"

that it lacks a sufficient body of supporting empiri-

cal evidence, that "distinct intervals" or breaks are

absent between some of its "stages," and that it is

based in the main part on the experiences of only the
modern developed Western nations and, as such, is
not applicable to the problems facing the nations of
the rest of the world. While some of the comments
concerning Rostow's theory show insight and careful
study, others indicate a lack of careful and complete
reading of his theory and a misunderstanding of the
concepts he attempted to set forth.

The nonempirical comments concerning Professor
Rostow's theory are so diverse that grouping them
according to topic heading would result in almost as
many topic headings as comments. Thus, the approach
used here is to group the comments under the individu-
als who have made them, ordering the individuals in
such a way as to present as much unity as possible.
The views and appraisals concerning Professor Rostow's
theory which follow are entirely those of the respective
authorities cited; in these synopses the present author
has made an earnest effort to exclude his own comments.

S. G. Checkland

According to Professor S. G. Checkland of the
University of Glasgow, Professor Rostow's stages theory
of economic development contains much historical truth
when taken at the appropriate level of generality.
Since the late eighteenth century the experiences of

the most advanced industrial nations of the time--Great
Britain, France, the United States, Germany, Sweden,
Japan, and Russia--have conformed to approximately
the pattern that Professor Rostow describes. Rostow
has provided us with a kind of mnemonic scale with
which we can arrange our thoughts. Also, Rostow's
theory provides many illuminating insights into the
historical operation of phases which societies go
through. These seem particularly well brought out
as Rostow traces the movement of initiative from one
sector of a nation's economy to another.

As we move, though, from historical descrip-
tion on to theory, certain difficulties arise. To
what extent are we being told that societies, once
they have "taken-off," are embarked upon a cumulative,
automatic course? Is Professor Rostow setting forth
a fairly narrow set of conditions which, if they are
present, will drive forward the growth process; or
is he, to a certain extent, stating or implying the
need for a certain number of further conditions reach-
ing far back into the nature of society, and themselves
not assimilated into his theory? In the extent to
which the latter is true, Rostow's theory seems to
lose a great deal of comprehensiveness.

Another difficulty lies in determining where
each economy falls within Professor Rostow's system.

This presumably can be determined by the inspection
of particular economies, and then by noting how they
are getting along in the increase and diversification
of their output. Even so, the timing of this process
is difficult to ascertain, and there is no built-in
clue as to the speed of this self-contained process.
Although Rostow provides us with very little systematic
help in the matter of timing, he does give us much
particular historical demonstration and reasoning.[2]

Albert Fishlow

Professor Albert Fishlow of the University of
California at Berkeley makes a number of perceptive
comments and shows a great amount of insight into
Professor Rostow's theory in his review of The Eco-
nomics of Take-Off into Sustained Growth (W. W. Rostow,
editor),[3] which is a report of the proceedings of the
1960 International Economic Association Conference at
Konstanz, Germany, which dealt with Rostow's historical
stages theory.

Professor Fishlow states that despite frequent

[2] S. G. Checkland, "Theories of Economic and
Social Evolution: The Rostow Challenge," Scottish
Journal of Political Economy, Vol. VII, No. 3 (Novem-
ber, 1960), p. 183.

[3] W. W. Rostow (ed.), The Economics of Take-
Off into Sustained Growth (New York: St. Martin's
Press, 1968).

clarifications and restatements of the take-off con-
cept at the conference by Rostow, the underlying
duality of the take-off concept was not resolved.

At the first level, "the take-off is a sec-
toral, non-linear, threshold notion . . . [in] . . .
the realm of the leading sector, with its forward,
backward and spreading effects breathing regular
innovation into the heretofore slumbering corpus
economicum. It is the domain of certain crucial
industries, such as those of coal, iron and engineer-
ing."[4] At this level, economic growth can be viewed
as a constant struggle among a succession of activi-
ties, or sectors, first accelerating and then decel-
erating.

At the second level, the take-off concept is
highly aggregative. It is in "the setting . . . of
the familiar Harrod-Domar model in which the rate of
growth of income is the product of an average propen-
sity to save and the inverse of a reasonably stable
capital-output ratio."[5] At this level, then, the
take-off consists of a recognizable discontinuity
in the observed growth of per capita income--which
under these conditions means a sharp increase in the

[4]Albert Fishlow, "Empty Economic Stages?,"
Economic Journal, Vol. LXXV (March, 1965), p. 113.

[5]Ibid.

rate of savings. These two theories are not, of course,
mutually exclusive; but neither are they ever inte-
grated by Rostow into a single framework.

At the first level, the discussion of inter-
industrial relationships takes for granted the avail-
ability of resources and emphasizes instead the power
of demand as a connecting link in stimulating growth
among complementary activities. In effect, then, a
mechanism exists for transmitting autonomous impulses
affecting one sector to the economy as a whole--not
only by means of output, but also by means of tech-
nology. On the other hand, at the second level, the
aggregative model takes as its starting point the con-
straint of savings, and hence of investment, without
which growth cannot attain regularity at high rates.

It seems that, within an environment where
the inducement to invest is the limiting factor rather
than savings, the sectoral, or first, approach would
be the more fruitful one.[6] However, Professor Rostow
fails to state the conditions under which one approach
rather than the other yields a better explanation of
how growth takes root, or of how the two approaches
are related. By shifting between these two approaches
in an almost random fashion, Rostow seems to do the

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[6]Ibid.

concept of the take-off very little service; and by
not introducing resource constraints and a more com-
plete discussion of technological diffusion into his
first, or sectoral, theory he deprives it of a clarity
and consistency that the second, or aggregative, theory
enjoys.[7]

Overall, the second, or aggregative, approach
to the take-off has not fared well. While it is unable
to deliver the universal, endogenous theory of develop-
ment it promises, such criticism should not obscure
the numerous insights the take-off has to offer at
the first, or sectoral, level.[8]

One can, according to Professor Fishlow, find
several concrete instances in which Professor Rostow
was in error. One of these is the supposed importance
of the railroad in triggering the take-off. In the
United States, for example, Rostow misstated the role
played by the railroad before 1860 in assisting the
development of a machinery industry. Fishlow states:
"The reason locomotives and other equipment were pro-
duced domestically so soon after the introduction of
the railway was that machinery firms were already in
existence to serve the textile and steamboat interests.

[7]_Ibid._, p. 114.

[8]_Ibid._, p. 120.

Virtually all the locomotive firms grew out of such origins."[9] The unique significance of the railroad resides in the engineering inputs required in its substantial maintenance requirements. "Widely dispersed repair shops training pools of local talent undoubtedly were a significant factor in technological diffusion."[10]

Professor Rostow's emphasis on the industrial consequences resulting from the backward linkage of railroadisation as being crucial in the United States seems to miss the point. At the time when pig iron output first underwent an apparent rapid expansion in the 1840's, iron rail demand was an insignificant proportion of the whole. Coal, also, was only a minor need for railroad operations in this era of wood-burning engines. What really made the rapid projection of the railroad in the 1850's so important was the impetus it gave to agricultural expansion. "In this and other instances Rostow tends to understate the role of the market, actual and anticipated, in favor of derived demand nexuses. While the latter may to-day be more potent, we should not re-write history in its image. Modernisation may proceed

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[9]Ibid.

[10]Ibid.

impelled by relative prices as well as by government, and by way of forward linkages as well as backward."[11]

The important thing to note, though, is that Professor Rostow gives productivity increase an explicit and central position in his theory. "This is a great advance beyond the simple capital-accumulation models still current."[12]

According to Professor Fishlow, the claim and emphasis of universality for Professor Rostow's take-off is a serious mistake; the take-off concept provides no opportunity to array national experiences--no chance to contrast and compare, and thus to fashion a hypothesis relevant to all countries. Nineteenth and twentieth-century take-offs are not differentiated by Rostow; he uses his simple aggregative model to serve for all times and places.[13]

Professor Fishlow feels that an unfortunate rigidity is imposed by enmeshing the take-off concept within a "full-blown" stage theory of economic evolution. As in most nineteenth-century conceptions of progress, the path suggested by Professor Rostow is orderly and monotonic: societies move through each

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[11]Ibid., pp. 120-121.

[12]Ibid., p. 124.

[13]Ibid., p. 119.

of the stages in succession. Unfortunately, though,
excluded by such a hierarchy are many of the most
interesting cases--economies that entered well into
the transition phase but did not succeed. In particu-
lar, a number of the nations in Latin America seem to
have been so beset.[14]

Barry E. Supple

Professor Barry E. Supple of the University
of Sussex has made some general comments concerning
the potential contributions of the Economic History
approach which relate to Professor Rostow's work.
According to Professor Supple, ". . . it seems . . .
that we know too little about economic processes
(whether in a backward or a developing context) to
ignore any possible source of enlightenment or tech-
nique of study."[15] Supple feels that economists tend
to expect too much from history, and that they tend
to extend their own emphasis of "simplicity and gen-
erality" into an area which cannot sustain it in
precisely the same form. As a result of this, econo-
mists tend to be disappointed when, looking for

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[14]Ibid., p. 115.

[15]Barry E. Supple, "Has the Early History of
Developed Countries any Current Relevance?," American
Economic Review, Vol. LV (May, 1965), p. 103.

universal hypotheses, they come to discover, "that

economic history does not yield what it cannot pro-

duce."[16]

Andre Gunder Frank

Professor Andre Gunder Frank of Sir George

Williams University in Montreal provides some severe

criticisms of Professor Rostow's theory. According

to Professor Frank, it is impossible, without closing

one's eyes, to find in today's world any country or

society which has the characteristics of Professor

Rostow's first, traditional, stage. This is not sur-

prising, though, "since the construction of Rostow's

stages takes account neither of the history of the

now underdeveloped countries, nor of their crucial

relations with the now developed ones over several

centuries past."[17] Not only is Rostow's first,

traditional, stage not to be found in any underde-

veloped country today; but also his second stage,

the preconditions for take-off into economic devel-

opment, is even more conspicuous by its absence.[18]

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[16]Ibid., pp. 100-101.

[17]Andre Gunder Frank, Rostow's Stages of Eco-
nomic Growth through Escalation to Nuclear Destruction
(Ann Arbor, Michigan: The Radical Education Project),
p. 2.

[18]Ibid., p. 3.

"Abundant historical evidence from the under-
developed countries shows that Rostow's first two
stages are fictional. Contemporary evidence from them
shows that his last two stages are utopian."[19] This
"misrepresentation of reality" by Rostow follows from
a theoretical error of the first magnitude and of
vital importance for development theory and policy.
The error is that of "examining only parts of the
domestic structure of the country concerned."[20]

The fundamental reason why the whole of Pro-
fessor Rostow's approach must be rejected by those
who would meaningfully understand and deal with the
problems of economic development and cultural change
is that his approach, in all its variations "ignores
the historical and structural reality of the underde-
veloped countries."[21]

A. K. Cairncross

Professor A. K. Cairncross of the University
of Glasgow doubts that Professor Rostow's historical
stages theory of economic development helps us to
understand "the sweep of modern history." In addition,

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[19]Ibid., p. 4.

[20]Ibid., p. 7.

[21]Ibid.

he cites a number of difficulties inherent in Professor Rostow's historical stages approach. First, do the available data provide an adequate basis for generalization? The relevant data mainly relate to a dozen or so countries over the past century or two. "Even for this dozen countries, the key statistics, until comparatively recently, are highly imperfect: for example, the course of real wages and the movement of savings-ratios are open to serious dispute for all countries before 1913 and so far as I know there is no reliable cost of living index number for any country covering the whole of the nineteenth century."[22]

Also, it might be asked, "Can a country fall back into the stage of preconditions after an abortive take-off, or take-off more than once, or keep fluttering as if it were about to take-off without ever doing so?"[23] Is Professor Rostow's sequence of stages invariable, so that one is able to tell in advance what lies ahead? Also, how can one tell whether the transition from one stage to another is complete? "When Rostow gives dates for the beginning and end

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[22]A. K. Cairncross, "The Stages of Economic Growth," Economic History Review, Second Series, Vol. XIII, No. 3 (April, 1961), p. 453.

[23]Ibid.

of take-off, by what criteria, open to corroboration
by other historians, does he select these dates?"[24]

Perhaps the most doubtful of Professor Rostow's
stages is his last one. If Rostow had named his final
stage "the age of the automobile" how much of his
meaning would have been lost? Rostow himself had
in mind other consumers' durables in addition to
automobiles, and he referred several times to hous-
ing. It is difficult for one to see any special sig-
nificance in the fact that at higher levels of income
people show an elastic demand for durable goods. "A
much more significant fact is the tendency in modern
times for rising incomes to go with greater equality--
a fact that Rostow does not analyse and that in itself
helps to account for the mass consumption of durable
goods."[25]

Professor Cairncross asks, "What is the sig-
nificance of the threefold choice between national
power, social welfare, and high mass consumption in
the final stage, when the same choice has had to be
made all along the path of growth? If the choice is
a free one it need not fall on high mass consumption."[26]

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[24]Ibid.

[25]Ibid., p. 454.

[26]Ibid.

According to Professor Cairncross, the stage
of Professor Rostow's theory that has struck the pub-
lic mind most forcibly is the take-off. Is there a
genuine discontinuity rather than a simple accelera-
tion of growth; and, if so, in what form does this
discontinuity show itself? In what sense does this
discontinuity herald a decisive break with the past,
and is it conceivable that this discontinuity is of
such a nature that it can be identified with a pre-
cise span of time, say twenty years?[27]

Professor Rostow cites a rise in the rate
of productive investment during the take-off, "from,
say, 5% or less to over 10% of national income."[28]
This is a view that has been expressed by some other
economists, notably Arthur Lewis, although no one
other than Rostow has associated it with the take-
off period. Presently available historical evidence,
though, does not justify Rostow's "quite exceptional
emphasis laid on a sharp increase in this ratio how-
ever measured, at the outset of rapid growth."[29]

In the light of these things, does Professor
Rostow's approach help us to understand what went on

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[27]Ibid.

[28]Rostow, The Stages of Economic Growth, p. 39.

[29]Cairncross, p. 456.

in any individual case of industrialization or make
it easier to see what a particular country seeking
to industrialize itself ought to do? "It would be
absurd to answer these questions with a blank nega-
tive; a great deal of what Rostow says is undoubtedly
helpful. But it is so . . . in spite of, rather than
because of, the stage approach which he adopts."[30]

P. T. Bauer and Charles Wilson

According to Professors Bauer and Wilson of
the London School of Economics and Jesus College, Cam-
bridge, Professor Rostow's stages of growth theory
provides not only an analytical framework for the
study of economic development everywhere and at all
times, but it also lays bare the essentials of past
and present world conflicts, and of the dangers that
beset us. In addition, it points the way to action
designed to remove both the threats of mass destruc-
tion and of spiritual stagnation in the west and also
to promote the development of the under-developed
world.[31]

Professor Rostow's book, The Stages of

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[30]Ibid., pp. 457-458.

[31]P. T. Bauer and Charles Wilson, "The Stages
of Growth," Economica, New Series, Vol XXIX (May,
1962), p. 193.

Economic Growth: A Non-Communist Manifesto, has been
widely praised.   Part of this book's attraction seems
to be derived from factors external to its central
theme and approach.   The appeal owes much to Rostow's
forecasts and proposals for policy, since in many
ways they tell people what they want to hear as, for
example, his proposals for massive foreign aid, or,
even more important perhaps, his suggestion that there
are readily discernible and not too complex methods
for resolving some of the world's most intractable
problems.   Rostow's frequent references to "history"
also enhance his book's appeal.[32]

        Is Professor Rostow's explanation of the
progress from one of his stages to the next satis-
factory?   Rostow claims to offer a general theory of
economic development by laying bare the specific fac-
tors behind the advance of societies from one stage
to the next, but the claim does not seem to be sub-
stantiated.   At times he suggests that progress
depends on a few specific variables, while at others
this is significantly modified by the introduction
of additional variables and qualifications often
so general as to cover almost all situations.   His
exposition thus vacillates between the suggestion,

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        [32]Ibid., pp. 193-194.

on one hand, that the configuration of societies in
particular stages of development and their progress
from one stage to the next are shaped by certain
key variables, and the suggestion, on the other
hand, that they depend essentially on a large number
of interrelated variables and influences, which are
often unspecified and the operation of which depends
mainly on local circumstances. These additional
variables and qualifications are sufficiently numer-
ous and stated in sufficiently general terms so as
to reduce much of the argument to unhelpful state-
ments such as that economies will advance if there
are enough progressive sectors, or that in economic
life all factors are interrelated and that everything
depends on everything else. A theory such as this
which depends on such escape clauses cannot be
effectively refuted; but, equally, it cannot explain
anything.[33]

Nowhere does Professor Rostow offer clearly
defined specific criteria for the definition and dating
of his historical stages of growth. These stages are
not defined in terms of clear-cut or specific cultural,
scientific, material or technical attainment; and the
absence of such criteria enables Rostow to classify

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[33]Ibid., pp. 194-195.

historical periods practically at will. Thus, he

is able to regard eighteenth or even nineteenth-

century Britain, North America and Western Europe

as falling in his traditional stage, while regard-

ing large parts of the underdeveloped world in the

twentieth century, including India, as being two

stages further forward.

At crucial stages in his discussion where

the argument requires a measure of precision, the

terms employed by Professor Rostow are imprecise and

hazy. For example, the stage he terms "maturity"

is said to be attained when new, modern techniques

spread throughout the economy; but if "modern"

refers to what is most advanced at any given time,

then neolithic Europe was a mature economy with tech-

niques that were in advance of those of the old stone

age. As for his "age of high mass-consumption," it

is arbitrary to designate, as Rostow does, the wide-

spread use of consumer durables as its criterion.

"High" is of necessity a comparative concept, usually

relative to what has gone before. Thus, the nineteenth-

century can at least as justifiably be termed the age

of high mass-consumption; because its articles were

cheap clothing, soap, sugar, tea, and many other com-

modities which caused a radical transformation in the

social life of the people.[34]

Professor Rostow's choice of a 10 percent
rate of net investment as being required for a con-
tinued rise in real income per head, if that is what
he means by self-sustained growth, is arbitrary.
Even if the rate of growth of income per head depended
mainly on the growth of capital and on technical
advance, a continuous rise in income per head could
be attained with a much lower rate of net capital
formation where technical progress is sufficiently
rapid, or where the population is stationary or
increases slowly.[35]

Three points might be noted about Professor
Rostow's theory. First, Rostow's account of the
path of development after the take-off deals entirely
with success stories, in as much as it is confined
to countries which are now a part of the developed
world. Second, his policy proposals reflect a belief
that the differences between different levels and
rates of economic development are largely temporary
and abnormal and can be bridged or eliminated as a
result of comparatively simple policy proposals in a
relatively brief period of time. This view appears to

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[34]Ibid., p. 196.

[35]Ibid., p. 197.

be unsubstantiated, and seems contrary to both his-

torical and contemporary evidence. Third, and perhaps

most important, Rostow's policy proposals totally

ignore the relevance of the factors just enumerated,

especially habits, attitudes, qualities, customs, and

institutions; and although his theory appears to

embrace economic, political, and cultural influences,

the proposals he makes, based on his key variables,

seem to reflect a belief in economic development with-

out cultural change.[36]

Goran Ohlin

According to Professor Goran Ohlin of Columbia

University, the mysteries of economic growth and devel-

opment have not been couched in such a beguiling termi-

nology and such a simple but powerful analysis until

Professor Rostow presented what he terms "an economic

historian's way of envisaging the sweep of modern

history."[37] What is important, in evaluating Professor

Rostow's historical stages theory, is how useful and

rewarding it is to view historical growth through his

particular prism. It should be noted that his treatment

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[36]Ibid., p. 199.

[37]Goran Ohlin, "Reflections on the Rostow Doctrine," Economic Development and Cultural Change, Vol. IX, No. 4 (July, 1961), p. 648.

of the traditional and transitional societies is remarkably successful in spite of its brevity.[38] His smart and snappy take-off, though, seems only to be the old Industrial Revolution in a streamlined version.[39]

Professor Rostow's "age of high mass-consumption" stage is not a statistical concept at all. He defines it as the consumption of durables: automobiles, refrigerators, washing machines, television sets, and all the gadgetry of modern life. We might ask why the countries of Western Europe did not in the 1920's proceed directly into the age of durable consumers' goods, as did the United States. Rostow's answer ambiguously refers to "governments" and "people" in explaining the stagnation of the European economies in the 1920's. "Can this by anything but nonsense? There is no mention of relative incomes in Rostow's pages, but when West European per capita incomes in the 1920's were about half (or less) of the American, this would . . . seem to go far in explaining why Europeans might have found difficulty in following the . . . lead set by American consumers."[40] After World War II when

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[38] Ibid., p. 649.

[39] Ibid., p. 650.

[40] Ibid., p. 651.

European incomes reached the level the United States
had attained in the 1920's, the age of gadgetry
finally dawned on Western Europe. One can only wonder
why Rostow must make such simple things so complicated,
when he can make such complicated things so simple.[41]

The question is not only how one should choose
his stages, but also how deep a significance he should
attribute to their definition. "The Rostovian sequence
pretends to a theoretical backbone of sorts, but when
it makes one squirm with unease at many points, it is
above all because it brings into the open the tension
between continuity and periodization in historical
analysis."[42]

J. H. Habakkuk

Professor J. H. Habakkuk of the London School
of Economics has some rather severe criticisms of
Professor Rostow's historical stages theory. He
feels that Rostow's book, The Stages of Economic
Growth: A Non-Communist Manifesto, belongs in that
category of literature, of which in economics Malthus's,
Essay on Population, is the most notable example, which
attempts to sweep wide tracts of the human experience

[41]Ibid., pp. 651-652.

[42]Ibid., p. 649.

into a few central categories. This book contains
some ideas on how one stage proceeds toward the next,
but these stages do not cohere into anything which
could be reasonably dignified as a theory of produc-
tion--the book is essentially an essay in classifica-
tion.

At the center of Professor Rostow's argument
is the assertion that during the take-off stage there
is one brief interval in the history of a society in
which changes take place which insure that growth
becomes the normal condition of that society. As to
whether periods so critical and so precisely compressed
in time exist, Professor Habakkuk feels that the Euro-
pean experience did not conform to this pattern. In
the European nations, growth has been more rapid in
some periods than in others, and some innovations, such
as the railways, have had much more profound effects
than others; but he sees no evidence that there has
been solely one decisive phase in the history of each
growing economy.[43]

In addition, Professor Rostow's preconditions
stage presents certain difficulties. Certainly one of
the most important requirements of a precondition must

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[43]J. H. Habakkuk, "A Review of, The Stages of
Economic Growth: A Non-Communist Manifesto, by W. W.
Rostow," Economic Journal, Vol. LXXI, No. 283 (Septem-
ber, 1961), p. 601.

be that it occur first in time. In England, though,
the principal changes in transportation and agriculture
took place during rather than before the period of
accelerated growth; in Russia the pertinent agricul-
tural developments occurred late in the decade after
the take-off had gotten under way, and in China they
are occurring in the middle of the period to which
Rostow assigns her take-off. Thus, in many cases the
increase of agricultural output and the creation of
social overhead capital are not conditions whose pre-
existence explains the acceleration of growth; instead,
they are a part of the acceleration which needs to be
explained.[44]

Another criticism by Professor Habakkuk con-
cerns Professor Rostow's references, in his book, to
"self-sustaining," "self-reinforcing," and "on-going"
growth. This, according to Habakkuk, does not seem to
be anything more than growth of the usual straight-
forward variety; but the adjectives used by Rostow
seem to offer an assurance that once one or two criti-
cal decades are over, a society can rely on automatic
growth to carry it forward into the following stages.
Although in Rostow's book the approximate date of the
Turkish take-off is given as 1937, a footnote states

[44]Ibid., pp. 601-602.

that--almost a quarter of a century later--it still
remains to be seen whether Turkey has successfully
made the transition into self-sustaining growth.
Thus, it appears that Rostow's take-offs can only be
confidently identified retrospectively--and that we
can only tell if growth is going to be self-sustain-
ing, if in fact, it has been sustained for a long
period of time.

On the positive side, there are in Professor
Rostow's book some penetrating pages on colonialism,
and a highly original analysis of why post-1945 has
been so different from post-1918. Few of Rostow's
insights seem to depend on his stages of growth, "but
it may fairly be retorted that it was in the course
of elaborating these stages that Professor Rostow had
these insights."[45]

The Rostovian stages are very much less mis-
leading than the Marxian stages of feudalism, capital-
ism, imperialism, and socialism; but the virtue of a
given system is not to be judged by its power to
establish itself as a mnemonic--nor by its random
shafts of light. Any system will yield fresh view-
points because it compels a person to group facts in
unaccustomed ways, and often a quite arbitrary system

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[45]Ibid., p. 603.

yields many new viewpoints because of the great gap

between expectations and facts. The important test,

then, is whether the system makes the past more intel-

ligible and the future more predictable. Professor

Rostow's theory does not seem to succeed in doing

either.[46]

Everett E. Hagen

According to Professor Everett E. Hagen of the

Massachusetts Institute of Technology Center for Inter-

national Studies, one of the primary causes of the

wide popularity of Professor Rostow's book is the idea

conveyed by it that there is order in this uncertain

world. Professor Rostow's book implies that the seri-

ous efforts of men to bring about economic growth will

be rewarded, and that once the chain of events has been

started, a self-sustaining economic growth will follow.

Many of the readers of Rostow's book have gained a

feeling of comfort and relief, "from the brilliantly

portrayed doctrine of neat and rather rapid stages of

progress to economic success."[47]

Professor Rostow's division into stages and

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[46]Ibid., pp. 603-604.

[47]Everett E. Hagen, On the Theory of Social
Change: How Economic Growth Begins (Homewood, Illinois:
Dorsey Press, 1967), p. 515.

assignment of some events to one stage and others to another seems somewhat removed from reality to be useful for explanation or prediction. Among Rostow's preconditions is the establishment of an effective national government, and among the events of his take-off is the quick emergence of a favorable political, social, and economic framework. The terms Rostow uses in describing institutional changes are qualitative and ambiguous ones, and, thus, it is nearly impossible to determine when they have been satisfied. In addition, a survey of the historical evidence indicates that rather than certain institutional conditions being absolute requisites whose attainment can be assigned to one stage or another, institutions and governments gradually became more favorable to growth as the groups which were interested in new economic activities gradually gained more success, influence, and power.[48]

Case studies of specific countries have shown this sort of an emergence of more favorable political, social, and economic institutions by degree, while economic growth, similarly, proceeded by degree and without waiting for any given sort of institutional structure. The gradual appearance of favorable

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[48]Ibid., p. 517.

institutions from the late Middle Ages through the

nineteenth century is widespread knowledge and may be

referred to without being cited. "Even effective

national government in the minimum sense of that term

seems not to have been a necessary condition for

growth."[49]

The reason the trend in capital formation is

thought by Professor Rostow and almost all other econo-

mists to be so important is that, since technological

advances are embodied in capital formation, an adequate

rate of capital formation is necessary for a rapid

improvement in techniques and for a rise in per capita

incomes; direct evidence concerning trends in tech-

nological progress and per capita incomes is therefore

relevant to the point at issue. Presently available

evidence, though, indicates a gradual change from an

early period onward, rather than a movement in stages.[50]

Although Professor Rostow is in error in array-

ing the events of the transition from traditionalism

to economic modernism into a sequence of stages, such

that one stage is completed before another begins,

this fact should not obscure the perceptiveness of

his analysis in other areas. Rostow's historical

[49]Ibid., p. 518.

[50]Ibid., p. 520.

stages theory is an insightful summary of the complex
changes which occur, from which any student of the
process of economic development may obtain provocative
suggestions and an awareness of aspects he had not
fully appreciated before.[51]

Gerald M. Meier

According to Professor Gerald M. Meier of
Stanford University, the poor countries of today not
only confront Professor Rostow's take-off stage from
an absolutely lower level of per capita income than
did the presently developed countries, but also their
relative positions are inferior as compared to those
of other countries. This is quite unlike the position
of the early comers to economic development which
entered the industrialization process from a position
of superior per capita income relative to that of
other countries. Thus, the implications of attempt-
ing to develop rapidly from a lower level of per capita
income, and from a relative position which entails
more pressures of backwardness, deserves a fuller
treatment than Rostow's analysis provides.[52]

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[51] Ibid., p. 522.

[52] Gerald M. Meier, Leading Issues in Develop-
ment Economics: Selected Materials and Commentary
(New York: Oxford University Press, 1964), p. 43.

Another fundamental difference is that many
of today's poor nations have not, as of yet, experienced a significant degree of agricultural improvements as a basis for industrialization. The failure
to have yet gone through such an agricultural revolution makes the present problem of the take-off much
more difficult than it was for the now developed
nations when they were first entering into their
industrial revolutions.[53]

In short, the cultural contexts in many of
today's poor nations may not yet be as favorable to
economic development as they were in the now developed
nations before their take-offs. Also, whereas the
currently developed nations had already enjoyed a
long period of political independence and a stable
political framework before their take-offs, most of
the currently poor nations have only recently acquired
a real measure of political independence.[54]

M. Kant

According to Professor M. Kant of Manchester
University, Professor Rostow has ignored, or assumed
to be trivial, the inhibition that capital formation

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[53]_Ibid._, p. 44.

[54]_Ibid._, p. 45.

in underdeveloped nations may suffer due to the demonstration effect on consumption patterns, especially during periods of rapid income redistribution and growth. The demonstration effect, by increasing the demand for luxury goods and thereby causing a shift in factor allocation, may bring about a deviation of capital formation away from its optimum path. Rostow inaccurately assumes that, once an economy has received its initial momentum, the necessary supply of savings will flow into the channels of capital formation.

Also, Professor Rostow's projection of capital growth seems to have another defect in it. Rostow gives very little consideration to the problem of employment during the take-off. As the growth of capital gradually goes on becoming a built-in feature of the take-off economy, the productive process tends to become more and more capital-intensive. This produces two contrary effects in the economy: first, a rise in the marginal productivity of labor, and, second, an increase in the amount of unemployment. The second effect is likely to reduce the rate of capital formation to a level below that consistent with the social optimal rate of growth. This possibility has not been properly attended to by Rostow in his capital scheme

relating to the take-off.[55]

It is extremely doubtful that Professor Rostow's suppositions relating to the self-sustaining growth of the take-off can be substantiated. Rostow seems to assume the existence of entrepreneurs who are imbued with a pioneering zeal to embark on new enterprises at a time when depression is gradually overtaking the leading sectors. In such a circumstance, it would seem probable, instead, that the resistance to new investments would increase. Since Rostow's concept does not encompass the Keynesian prescription of balancing investment by the state on such occasions, it is not apparent how the economy can regather its momentum under such a situation. Consequently, Rostow's self-sustained growth model does not work unless we assume that the state artificially creates, through investment and other devices, new leading sectors--thus giving the economy continued momentum in its growth. This device, though, falls outside the range of assumptions discussed by Rostow.[56]

The dynamic method is more appropriate in explaining the nature of a growing economy, of which

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[55]M. Kant, "Rostow's Take-Off: An Appraisal," Indian Journal of Economics, Vol. XLIII (July, 1962), p. 29.

[56]Ibid., p. 31.

the take-off is one brief span; and it is to be regretted that Professor Rostow's analysis of the take-off period is essentially static. The equilibrium of Rostow's take-off economy is based on the concept of once-over changes rather than on steadily continuing change. Thus, we find that the equilibria which he visualizes for successive leading sectors are similar in nature. Furthermore, he is more concerned with absolute rates of investment, or production, than with the relative changes in those rates. Thus, the dynamic approach which consists, in essence, of examining ever changing variables, finds practically no place in Rostow's scheme.

In the end, it must be acknowledged that Professor Rostow has reoriented the study of economic growth by linking it up with a convergence of social, political, and economic values. Even Rostow's economic concept of the take-off, which has been so widely criticized, expresses in a general sense an impressive phenomenon of transformation.[57]

William N. Parker

Professor William N. Parker of the University of North Carolina in his American Economic Review

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[57]Ibid., p. 32.

article states that there is a peculiar, baffling

charm to the set of lectures contained in Professor

Rostow's book, The Stages of Economic Growth: A Non-

Communist Manifesto; in these lectures history is made

simple. Simplicity, relevance, and a high degree of

sincerity are some of the important sources of the

widespread appeal of these lectures, but there are

other sources as well. There appear on every page

bold assertions, immense claims, and sweeping insights

which are unsubstantiated by analysis or documenta-

tion.[58]

It is regrettable that, for all his boldness

and bravado, Professor Rostow has remained tied to an

extremely conventional historical framework. We see,

gleaming up through the water, a broken image of the

school of Schmoller.[59]

J. H. van Stuijvenberg

Professor J. H. van Stuijvenberg, a historian,

makes several criticisms of Professor Rostow's

preconditions stage. According to Professor van

Stuijvenberg, given Professor Rostow's criteria, the

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[58]William N. Parker, "A Review of, The Stages
of Economic Growth: A Non-Communist Manifesto, by
W. W. Rostow," American Economic Review, Vol. L, No. 5
(December, 1960), p. 1058.

[59]Ibid., p. 1059.

available historical evidence indicates that the initial date of the preconditions stage for Western Europe could be placed around the time of the crusades, about 1600, or in the middle of the 1700's-- rather than in the early 1700's where Rostow places it. Thus, it is not surprising that Rostow is so vague in indicating the commencement of the preconditions stage. In fact, in Western Europe the transition from the traditional society to the take-off took place so gradually that it is fully justified to ask whether a definite transition, indeed, ever took place.[60]

Professor Rostow's definition of his fourth stage of growth, the drive to maturity, also seems to have given him a great deal of difficulty. "If we are not mistaken . . . there is, in the last analysis, no essential difference between the take-off [the third stage] and the drive to maturity [the fourth stage]."[61] It is difficult to draw a hard line of distinction between these two stages, because there exists no definite interruption in the growth. The take-off transforms so very gradually, and without any

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[60]Henri Baudet and J. H. van Stuijvenberg, "Rostow's Theory on Growth," Weltwirtschaftliches Archiv, Vol. XC, Hft. 1 (1963), pp. 67-68.

[61]Ibid., p. 72.

essential change, into the drive to maturity that the whole distinction between these two stages seems artificial and superfluous.[62]

The conclusion to be drawn is that the conception of the stages of growth as presented by Professor Rostow is not acceptable. The distinction between Rostow's stages is rather arbitrary and subjective, and the boundaries between them are somewhat unclear. Thus, we are forced to conclude that historical events refuse to be forced into Rostow's scheme, and perhaps into any scheme whatsoever.[63]

Henri Baudet

Professor Henri Baudet, a historian, feels that Professor Rostow's historical ideas are similar to those of Spengler and especially those of Toynbee in many respects. All three of these historians appear to have a common pretension of empiricism and a common method of extrapolation. They all met the psychological needs, and expressed the general feelings of their times. Spengler, in 1917, expressed feelings of despair and inexorable disaster; Toynbee and Rostow, at a later time, gave expression to the hope of new

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[62]Ibid., p. 73.

[63]Ibid., pp. 74-75.

chances for a struggling and persevering world.[64]

Professor Baudet suggests that, even though Professor Rostow frequently mentions the importance of human response, he nevertheless fails to include genuine human factors in his theory. Rostow presents culture as the result of human attitudes and value systems in which neither myth nor religion plays an important part. In short, Rostow does not seem to bother with the psychological and irrational sources of culture.[65]

As an example of Professor Rostow's neglect, or oversimplification, of cultural factors, Professor Baudet suggests that, "Rostow's easy conviction of a general human equality seems . . . typically American, i.e., typically representative of the modern American approach to the problem of under-developed countries and of the American creed about future world-democracy."[66]

Professor Baudet does not take issue with Professor Rostow's careful analysis of British economic growth over the last two centuries; but he does dispute, on cultural-historical, on anthropological, and on psychological grounds, what he terms Rostow's

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[64]Ibid., pp. 59-60.

[65]Ibid., p. 61.

[66]Ibid., p. 62.

"generalization" of the British sequence of stages.[67]

In summary, Professor Rostow's analysis of economic growth and its stages in nineteenth century England, carried out along the lines of the historical school, gives a convincing sequence of stages of development--and although each equivalent case of another Western nation has had its particular characteristics and qualities, Professor Baudet believes in a general validity of Rostow's main theses, to the extent that nations of our own culture are concerned. On the other hand, he believes that Rostow's ideas of the non-Western world and of the depths of its real problems are fundamentally short-sighted and erroneous. The extrapolation of the British experience to a world scale is, in his opinion, unacceptable, both on methodological and on factual grounds.[68]

Summary

Whether or not Professor Rostow is correct in all of the specific aspects of his theory, the amount of comment and discussion it has stimulated attests to its significance. Rostow has done

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[67]Ibid.

[68]Ibid., p. 66.

much to reorient the study of economic growth by link-
ing it up with a convergence of social, political,
and economic values. The comments and analyses con-
tained in this chapter have been mainly of a non-
empirical nature and have centered on the theoretical
aspects of Rostow's theory--generally neglecting any
sort of empirical testing.

Perhaps the most widespread criticism of Pro-
fessor Rostow's theory has been that in it he has not
defined his concepts and theoretical framework in a
sufficiently rigorous manner. It has been felt that
some of the words and definitions he used in the expo-
sition of his theory can be given several different
interpretations. In addition, many of Professor Ros-
tow's critics have felt that his theoretical structure
was too "loose," and that in some of the aspects of
his theory he stated causal relationships in both
aggregate and sectoral terms, and then neglected in
any later part of his writings to tie these two
explanations together.

Professor Rostow's critics feel that he has not
offered clearly enough defined criteria for the defi-
nition and dating of his historical stages and that
the absence of such criteria enables him to classify
historical periods nearly at will in a manner which
cannot be readily corroborated by other economic

historians. Also, Rostow's theory implies that economic growth assumes an automatic, continuous course once the take-off stage has been completed. A number of his critics take issue with this and feel that in some cases the take-off may prove abortive, and that in others the economy of a country may flutter around as if about to take-off without ever doing so. They question whether once the one or two critical decades of the take-off are over a society can rely on automatic growth to carry it forward into the following stages.

Some of Rostow's critics express doubt that the take-off stage can be distinguished from the stage preceding it or the one following it by means of any sort of definite "discontinuity" (i.e., such as a rapid change in the proportionate size of the investment sector in a nation's economy) in the manner suggested by Rostow. Instead, they feel that gradual changes are more probable.

Professor Kant feels it important that Rostow ignored in his theory the inhibition that capital formation in underdeveloped nations may suffer due to the demonstration effect on consumption patterns--especially during periods of rapid income redistribution and growth. He also points out that Rostow gives very little attention to the problem of unemployment during

the take-off. This is important because, as the growth

of capital becomes a built-in feature of the take-off

economy, the productive process becomes more and more

capital-intensive, producing a rise in the marginal

productivity of labor and an increase in the amount

of unemployment. The effect of this unemployment,

Kant feels, is to reduce the rate of capital forma-

tion to a level below that consistent with the social

optimal rate of growth.

Professor Meier considers it unlikely that

the "cultural" contexts in many of today's poor

nations are as favorable to economic development as

they were in the now developed nations before their

take-offs, and he feels that this deserves a fuller

treatment than Rostow's analysis provides. Professors

Habakkuk and Hagen praise specific aspects of Rostow's

analysis suggesting that they provide "penetrating

insights." Professor Ohlin finds Rostow's treatment

of traditional and transitional societies useful and

rewarding, but he rejects Rostow's "smart and snappy

take-off" as being anything other than the "old

Industrial Revolution in a streamlined version."

While Professor Cairncross feels that Profes-

sor Rostow's historical stages theory does little

in helping to understand "the sweep of modern history,"

Professor Baudet believes in the general validity of

Rostow's main theses to the extent that nations of
our own culture are concerned. Baudet feels, however,
that Rostow's ideas of the non-Western world and of
the depths of its problems are fundamentally short-
sighted and erroneous.

Professor Rostow has made a great impact in
the field of development economics with his historical
stages theory. Although most of the comments in this
chapter dealt with the theoretical structure and sound-
ness of his theory, several pointed up the need for
additional empirical examination. Therefore, this
was felt to be an area in which fruitful results might
evolve from additional empirical examination.

CHAPTER IV

EMPIRICAL APPRAISALS OF PROFESSOR

ROSTOW'S THEORY

Introduction

The method used by Professor Simon Kuznets
of Harvard University, and others, in empirically
examining Professor Rostow's historical stages theory
has been to work with time series for various coun-
tries covering long periods of time. This approach
resulted in somewhat inconclusive results for the
reasons mentioned in Chapter I.

In this chapter, the work of Professor Kuz-
nets is discussed because he has synthesized the
work done by others as a complement to his own
research work in this area. Professor Rostow has
said concerning Kuznets' examination of his theory,
"His approach was not only more frontal, but also
embraced many of the issues raised by others."[1]

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[1]W. W. Rostow (ed.), The Economics of Take-
Off into Sustained Growth (New York: St. Martin's
Press, 1968), p. xiv.

Comments by Professor Kuznets

Professor Kuznets has suggested the following
criteria for examining any historical stages theory of
economic development:

1) A specific stage must exhibit empirically
    testable characteristics common to all, or
    to an important group of, units experiencing
    economic growth;

2) The features of a given stage must be dis-
    tinctive in that, not necessarily singly
    but in combination, they are unique to that
    stage. A mere precedence, or succession,
    in time can not suffice;

3) The analytical relationship to the preced-
    ing stage must be indicated--this involves
    something more than saying that the pre-
    ceding stage is one of preparation for the
    given stage;

4) The analytical relationship to the suc-
    ceeding stage must also be indicated;

5) The final requirement is for a delineation
    of the universe for which the generality
    of common and distinctive characteristics
    is claimed, and for which the analytical
    relationships of a given stage with the

preceding and succeeding ones are being

formulated.[2]

Based on these criteria, and his research

efforts, Professor Kuznets makes several observations.

First, he feels that Professor Rostow does an inade-

quate job of distinguishing the characteristics of

modern economic growth which differentiate it from the

traditional and other types of growth. Some of the

characteristics Kuznets suggests for this purpose are:

a high, sustained rate of increase in real product per

capita, usually accompanied by a high and sustained

rate of population increase; major shifts in the indus-

trial structure of the product and labor force, and in

the location of the population, commonly referred to

as industrialization and urbanization; changes in the

organizational units under whose guidance economic

activity takes place; a rise in the proportion of

capital formation to national product; and shifts in

the structure of consumer expenditures, accompanying

urbanization and higher incomes per capita.[3]

In addition, Professor Kuznets questions

whether the characteristics Professor Rostow uses in

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[2]Simon Kuznets, Economic Growth and Structure:
Selected Essays (New York: W. W. Norton & Company,
1965), pp. 215-216.

[3]Ibid., p. 213.

defining the take-off stage are sufficiently distinctive. Professor Kuznets asks:

> How distinctive are these characteristics?
> Do they occur in combination only in the take-off
> stage and in no other stage, particularly the
> preceding transition, or pre-conditions, stage
> and the succeeding self-sustained growth, or drive
> to maturity, stage? Professor Rostow is not
> explicit on this point. Presumably a rise in the
> investment proportion from 5 to 10 percent or more
> does not occur in the transition stage. Yet much
> of what Professor Rostow would attribute to the
> take-off has already occurred in the pre-conditions
> stage.[4]

Thus, Professor Kuznets feels that, given Professor Rostow's "fuzziness" in defining the take-off stage and in formulating its distinctive characteristics, he has not succeeded in delimiting the analytical relationships between the take-off stage and the preceding and succeeding stages.[5] Also, Kuznets feels that Rostow's analysis of the take-off and pre-conditions stages neglects the effect of historical heritage, the time of entry into the process of modern economic growth, the degree of backwardness, and other relevant factors concerning the characteristics of the early phases of modern economic growth in different traditional cultures.[6]

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[4]Ibid., p. 217.

[5]Ibid., p. 218.

[6]Ibid., p. 232.

Professor Kuznets states that, based on his research, the aggregative data fail to reveal the characteristics claimed by Professor Rostow as typical of the take-off stage; and, thus, serious doubt is cast on the validity of Rostow's definition of the take-off as a general stage of modern economic growth, as distinct from the pre-conditions stage and the self-sustained-growth stage following it.[7] Kuznets did not find evidence confirming "the doubling of capital investment proportions and the implicit sharp acceleration in the rate of growth of national product, claimed by Professor Rostow as characterizing his take-off periods."[8]

What Professor Kuznets' evidence indicates, then, is that the data he studied do not lend support to Professor Rostow's characterization of the take-off stage. Kuznets says, though, that, "the evidence used to test Professor Rostow's scheme is not conclusive."[9]

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[7]_Ibid._, p. 227.

[8]_Ibid._, p. 232.

[9]_Ibid._

Empirical Studies by Professor Kuznets

and Others

One of the most readily tested aspects of
Professor Rostow's theory is his statement that during
the take-off stage, capital formation rises from some-
what less than 5 per cent of national income to 10 per
cent or more.[10] The importance of these percentages
is that a rate of 5 per cent is not much more than
enough to offset population growth for many countries
and, thus, hold per capita income constant, while a
rate of 10 per cent or more seems to be enough to per-
mit a satisfactory rate of rise in per capita income.[11]

Professor Kuznets prepared a summary of the
available information for various countries concern-
ing long-term trends in the ratio of capital formation
to national income.[12] In compiling this informa-
tion he acknowledges having drawn heavily on the

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[10]W. W. Rostow, The Stages of Economic Growth:
A Non-Communist Manifesto (Cambridge: Cambridge Uni-
versity Press, 1960), p. 39.

[11]Ibid., p. 41.

[12]Simon S. Kuznets, "Quantitative Aspects of
the Economic Growth of Nations: VI. Long-Term Trends
in Capital Formation Proportions," Economic Develop-
ment and Cultural Change, Vol. IX, No. 4, Part II
(July, 1961). This is the sixth of a series of mono-
graphs on economic growth prepared by Professor Kuz-
nets, each published in separate covers as the second
part of an issue of Economic Development and Cultural
Change.

work done by others in this field. Among those he
acknowledges are: Miss Phyllis Deane of the Depart-
ment of Applied Economics, Cambridge University,
England; Professor Jean Marczewski of the Institut
des Sciences Economiques Appliquees of Paris, France;
Professor Walther Hoffmann of the University of Mün-
ster, Germany; Professor A. Giannone of the Instituto
Centrale di Statistica, Rome, Italy; Mr. Kjeld Bjerke
of the Statistical Department, Denmark; Mr. Juul
Bjerke of the Central Bureau of Statistics, Norway;
Dr. Osten Johannson of the University of Stockholm,
Sweden; Mr. N. G. Butlin of the Australian National
University, Canberra, Australia; Professor Henry
Rosovsky of the University of California, for his
estimates of capital formation in Japan; and Mr. D. G.
Franzsen and Mr. J. J. D. Willers of the Union of
South Africa.[13]

This study by Professor Kuznets is perhaps
the most complete survey, and accumulation of data,
presently available that deals with long-term trends
in the ratio of capital formation to national income.
Even so, in this study estimates are not available
covering early periods for countries other than England.
Thus, with the exception of England, there is no

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[13]_Ibid._, p. 3.

information as to how low the rate of capital forma-

tion was during periods before those which Professor

Rostow designates as the take-off.[14] For later peri-

ods, though, data are available for seven of the

thirteen countries for which Rostow provides "tenta-

tive, approximate take-off dates."[15] In Canada

("take-off, 1896-1914"), the percentage data for capi-

tal formation behave much as Rostow's theory would sug-

gest; but for the United States, these data are avail-

able beginning only in 1869, after the take-off had

supposedly ended according to Rostow's dates ("take-

off, 1843-1860"). In Germany ("take-off, 1850-1873")

the ratio of net domestic capital formation to net

national product was already 8.4 per cent in the earli-

est period for which data are available, 1851-1860,

and had reached 11.6 per cent by 1871-1880; and so it

would seem that the rise in capital formation from 5

per cent to 10 per cent of national income most likely

required a longer time than the take-off period sug-

gested by Rostow.

For Great Britain ("take-off, 1783-1802")

the estimates Professor Kuznets presents for periods

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[14]Everett E. Hagen, <u>On the Theory of Social
Change: How Economic Growth Begins</u> (Homewood, Illinois:
Dorsey Press, 1967), p. 519.

[15]Rostow, <u>The Stages of Economic Growth</u>, Table
1, p. 38.

before 1800 are available only for England and Wales.
Bearing this in mind, the ratio of net national capi-
tal formation to net national product for periods in
the eighteenth century is: 1700-1740, 4 per cent;
1740-1770, 5.5 per cent; 1770-1800, 6.5 per cent. In
later periods, for the United Kingdom, the ratio con-
tinued to rise slowly; and it did not reach 10 per
cent until the period 1860-1869. Thus, the change
suggested by Professor Rostow appears to have required
about a century.

For Sweden ("take-off, 1868-1890") the data
are presented only on a "gross" basis. On the assump-
tion sometimes used by Professor Kuznets that net
capital formation be considered 60 per cent of gross
capital formation, net capital formation was already
5.5 per cent of the national product in the 1860's.
It then rose slowly and irregularly during the next
eighty years and did not become 10 per cent of the
national product until the 1930's, seventy years
after the time Professor Rostow postulated as the
beginning of Sweden's take-off period.

Data for Japan ("take-off, 1878-1900") are
available beginning only in 1887. The ratio of net
capital formation to national product was 6.7 per cent
in the decade 1887-1896, and it did not reach 10

per cent until after World War I.[16]

In Argentina ("take-off, 1935-   "), except
during World War I, the ratio of capital formation to
national product was considerably above 10 per cent
from 1900 to 1930, before the beginning of the take-
off period suggested for it by Professor Rostow. Dur-
ing the depression of the 1930's and World War II the
ratio of capital formation to national product fell
below 10 per cent; and, then, in the decade 1945-1954
it rose to 11.5 per cent.

It seems difficult to interpret the data for
these countries in a way that offers support for Pro-
fessor Rostow's take-off thesis. Similarly, the data
for other countries presented by Professor Kuznets in
this study fail to support Rostow's theory. The
available evidence seems to suggest gradual change from
an early period onward, rather than a movement in
stages.[17]

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[16]The ratios are those for net domestic capi-
tal formation to net national product. The ratios
for net national capital formation to net national
product are slightly lower in the decade 1887-1896
and considerably lower after World War I.

[17]Hagen, On the Theory of Social Change, pp. 519-
520.

Comments Concerning this Approach

The approach used by Professor Kuznets and others is by far the simplest and most direct method of examining Professor Rostow's historical stages theory. It is also the method which most readily comes to mind as a means of examining Rostow's theory.

The major difficulty encountered in using this method has been the scarcity of data covering the early time periods of the countries examined. As an illustration of this, Professor Hoffmann has said in reference to his study of the German economy, "For want of material the subject can be dealt with only from 1850 onwards."[18] Similarly, Professor Cairncross in discussing the economies of the United States and the United Kingdom has stated, ". . . the record does not cover in any adequate way the period of take-off and so does not relate to any sudden acceleration in the rate of economic growth."[19] Also, Professor Cairncross, in discussing those countries for which we do have some sort of historical data, says, ". . . have we an adequate basis for generalization? The relevant data relate mainly to a dozen countries or so over the past century or two. Even

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[18]Rostow (ed.), The Economics of Take-Off into Sustained Growth, p. 113.

[19]Ibid., p. 249.

for this dozen countries, the key statistics, until

comparatively recently, are highly imperfect."[20]

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[20]A. K. Cairncross, "The Stages of Economic
Growth," Economic History Review, Second Series, Vol.
XIII, No. 3 (April, 1961), p. 453.

PART III

THE PRESENT STUDY AND ITS RESULTS

CHAPTER V

THE SELECTION OF COUNTRIES AND SCOPE

OF THE PRESENT STUDY

Introduction

The take-off stage is generally considered
to be the most crucial and original aspect of Pro-
fessor Rostow's historical stages theory. In the
present study an attempt was made to examine empiri-
cally a number of aspects of Professor Rostow's theory;
but, eventually, due to difficulties associated with
the quality of the data, it narrowed down to an
examination of several of the most important points
in Rostow's formulation of the take-off stage, and
of several lesser points concerning other aspects
of his theory.

The present chapter contains general background
material concerning the study which was conducted, and
Chapters VI and VII deal with the salient aspects of
empirical examinations of two of Professor Rostow's
major "requirements" which must be satisfied in order
for the take-off stage to occur. The results of an

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examination of an aspect of Professor Rostow's theory concerning the drive-to-maturity stage are mentioned in the last part of Chapter VI. In Chapter VIII are the results of a line of research, suggested in some of Professor Kuznets' writings, examining the rural and urban population aspects associated with economic development for the sample countries of the present study.

While previous examinations of Professor Rostow's theory, and of his take-off stage in particular, have attempted to use long-term data covering one or more centuries, this study examines the seventeen year span of United Nations national income accounts data now available for many of the countries in the world. Since Professor Rostow's take-off stage lasts only a brief time--in most cases about 20 years-- an analysis of this seventeen year span of data is used as a means of examining Professor Rostow's theory, and especially his take-off concept. In the present study the data have been examined in detail for those countries which now seem to be passing through Professor Rostow's take-off stage.

Why Professor El-Kammash's Ranking of

Countries Was Chosen

For the purpose of this study, a large proportion of the countries in the world were selected as a sample and ranked according to level of economic development, in expectation that the countries along this ranking would fall into Professor Rostow's various stages of economic development. Further, if Professor Rostow's statements concerning the take-off stage are correct, a group of countries somewhere along this ranking should display properties similar to those specified by him as belonging to the take-off stage.

A number of studies that ranked nations according to level of economic development were examined before selecting one which was considered most satisfactory in terms of the needs of the present study. The one chosen was Professor Magdi M. El-Kammash's, "On the Measurement of Economic Development Using Scalogram Analysis."[1] This study was chosen for two reasons. First, based on recent data, it ranked a reasonably large number of countries in order according

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[1]Magdi M. El-Kammash, "On the Measurement of Economic Development Using Scalogram Analysis," Papers and Proceedings of the Regional Science Association, Vol. XI (1963), pp. 309-334.

to their level of economic development. Second, it was more sophisticated, and took more factors into consideration, in its ranking of countries than most of the other studies which might have been chosen. Thus, to the extent that reasonably accurate and complete United Nations data are available, the countries examined in the present study are those discussed in Professor El-Kammash's article.

Based on United Nations population estimates for 1967, the 49 countries ranked in Professor El-Kammash's study contain slightly more than half of the world's population, while the 46 of these countries examined in Chapter VI--and the 47 examined in Chapter VII--of the present study account for somewhat more than one third of the world's population.[2] No other study examining the validity of Professor Rostow's theory was found which examines such an ambitious sample of the countries in the world.

Selection and Ordering of Countries

While at the Department of Economics of Duke University, Professor El-Kammash completed a study in

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[2]Calculated using data from, United Nations, Demographic Yearbook, 1967 (New York: Statistical Office of the United Nations, 1968).

which he ranked 49 countries according to degree of
economic development on the basis of the following
variables: 1) infant mortality rates, 2) degree of
illiteracy, 3) gross capital formation as a percentage
of gross national product in 1955, and 4) share of the
agricultural sector (agriculture, forestry, and fish-
ing) in gross domestic product in 1955.[3] Using these
four variables, the countries were grouped into five
successive categories of economic development, "based
on the total scores of scaling," the ordering of
countries within each category being based on per
capita national product averaged over the years 1952-
1954.[4] The number of countries ranked in order of
economic development was limited to 49 because of the
unavailability of satisfactory data on these four
variables for additional countries.

In choosing an index of economic development,
one is faced with a choice between using a single
variable index or with using the multivariate approach.
The first approach is less satisfactory because the
index is concerned not with the measurement of economic
development, but rather with indicating changes in the
one variable included in the model--changes that may

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[3]El-Kammash, pp. 316-317.

[4]Ibid., p. 321.

or may not reflect changes in economic development.

While scaling techniques were initially devised to solve the problems of attitude measurement and public opinion, and particularly to determine the dimensions implied in a set of items, they can also be applied to the problem of measuring economic development. Scaling techniques are particularly well adapted to this purpose, because the data obtained from underdeveloped countries are generally unreliable. Although the data which are used to describe economic development appear as percentages and rates, they may be considered semi-qualitative because of the large margins of error involved in the process of collecting them.[5]

There are many variables which might be considered relevant to economic development, but many of these variables are not completely independent of each other. For example, in the case of infant mortality rates and crude death rates, the former are evidently related to the latter; but since including both variables would probably not seem desirable, the former might be selected on the grounds that they are _more sensitive to changes_ in the level of economic development. Also, the availability of data is a limiting

[5]_Ibid._, pp. 312-315.

factor to be considered in the selection of variables
to be included in the construction of a scale.[6]

Thus, the criteria adopted by Professor El-
Kammash in the selection of variables were:

1) the sensitivity to register the changes in
the degree of economic development, and

2) the availability of data.[7]

On the basis of these criteria, four variables
were selected:

1) Infant mortality rates (M). This demo-
graphic factor is the number of deaths of
infants under one year of age per thousand
born alive in 1955. Infant mortality was
chosen because it represents more demographic
aspects than crude death rates. Besides
reflecting the health situation of the com-
munity, infant mortality is related to birth
rates which are known to be closely associ-
ated with economic development. Infant
mortality rates also generally vary inversely
with economic development.

2) Degree of illiteracy, as represented by the
percentage of population 15 years and over
which was illiterate in the latest census
since 1947 (I). This factor contributes
to and is affected by economic development
to a great extent. The higher the country
rises in the ladder of development, the
wider education spreads among its people.
But there is a difficulty which arises from
the differences in the criteria used to
define literacy from one country to another.

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[6]Ibid., pp. 315-316.

[7]Ibid., p. 316.

In some places it is considered the ability
to read, in others the ability to write,
while in a number of cases both reading
and writing are necessary. There is also
no agreement on the segment of population
to be included. In some countries it is
taken to be the population from age 5 to
65, in others it is 15 to 65. However,
the figures were taken as they were because
the dichotomy will not be significantly
different if adjustments be made to make
the data comparable.

3) Gross capital formation, as a percentage
of gross national product in 1955 (C).
This is an important variable, which reflects
the increase in income caused by economic
development. It is always argued that
economic development depends to a great
extent upon the saving habits of the people.
The aggregate for this variable was taken
and not the per capita values. The reason
for this procedure is that our concern is
the long term trend in capital formation
unaffected by changes in the size of popu-
lation. Our assumption is that the more
the country is developed, the higher will
be aggregate capital formation.

4) Share of agricultural sector (agriculture,
forestry and fishing) in gross domestic
product in 1955 (A) for most underdeveloped
countries are agricultural economies. This
variable reflects the urbanization factor,
and the change from industries dependent on
agriculture to non-agricultural industries.
It is considered that the more the country
is developed, the smaller is the share of
agricultural sector in gross domestic pro-
duct.[8]

Data on these four variables were collected

for 49 countries. Although in most cases the data for

these 49 countries were sufficient, in some cases

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[8]_Ibid._, pp. 316-317.

estimates had to be made for unavailable data. It
was decided to divide the data into two mutually
exclusive groups in the manner shown in Table 1.
To decide on the various points of division between
these two mutually exclusive groups, the range for
each variable was taken, and an arbitrary point was
chosen which fell in the middle of that range. In
Table 1, "0" designates those characteristics which
show underdevelopment, and "1" designates those which
show development. Similarly, the same designations
are used in Table 2.[9]

In Table 2, the results of scaling provided
a classification of the 49 countries into five cate-
gories ranging from highly developed countries (those
with a total score of 4) to those which are underde-
veloped (those with a total score of 0), as can be
found in the next to the last column. Based on these
scores, ranging from 0 to 4, the countries are divided
into five categories, or levels, of development (see
the last column of Table 2). The countries having the
highest possible total score (4) are classified as
falling in the highest category of development (V),
and those having the lowest possible total score (0)
are classed as falling in the lowest category of

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[9]_Ibid._, p. 317.

TABLE 1

A DIVISION INTO TWO GROUPS USED IN SCORING

Characteristic	Indicating Development (1)	Indicating Underdevelopment (0)
	LOW RATES	HIGH RATES
Infant mortality rates (M)	Below 50 infant deaths per 1000 born alive	50 and above per 1000
	LOW DEGREE OF ILLITERACY	HIGH DEGREE OF ILLITERACY
Degree of illiteracy (I)	Less than 35 per cent of the people illiterate	35 per cent and above of the people illiterate
	LOW PERCENTAGE	HIGH PERCENTAGE
Share of agricultural sector in Gross Domestic Product (A)	Share of agricultural sector in Gross Domestic Product less than 30 per cent	Share of agricultural sector in Gross Domestic Product 30 per cent and over
	HIGH PERCENTAGE	LOW PERCENTAGE
Capital formation as a percentage of Gross National Product (C)	Percentage ratio of Gross Capital Formation to Gross National Product 15 per cent and over	Percentage ratio of Gross Capital Formation to Gross National Product less than 15 per cent

Reproduced from: Magdi M. El-Kammash, "On the Measurement of Economic Development Using Scalogram Analysis," Papers and Proceedings of the Regional Science Association, XI (1963), Table III, p. 318.

TABLE 2

CLASSIFICATION OF COUNTRIES ACCORDING TO CATEGORIES OF DEVELOPMENT

Country	Development Characteristics				Total Score	Category of Development
	M	I	A	C		
1. United States	1	1	1	1	4	V
2. Canada	1	1	1	1	4	V
3. Switzerland	1	1	1	1	4	V
4. New Zealand	1	1	1	1	4	V
5. Sweden	1	1	1	1	4	V
6. Australia	1	1	1	1	4	V
7. Luxembourg	1	1	1	1	4	V
8. Belgium	1	1	1	1	4	V
9. United Kingdom	1	1	1	1	4	V
10. Denmark	1	1	1	1	4	V
11. Norway	1	1	1	1	4	V
12. France	1	1	1	1	4	V
13. Finland	1	1	1	1	4	V
14. Germany (West)	1	1	1	1	4	V
15. Netherlands	1	1	1	1	4	V
16. Austria	1	1	1	1	4	V
17. Japan	1	1	1	1	4	V

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TABLE 2 (Cont.)

Country	Development Characteristics				Total Score	Category of Development
	M	I	A	C		
18. Argentina	0	1	1	1	3	IV
19. Puerto Rico	0	1	1	1	3	IV
20. Italy	0	1	1	1	3	IV
21. Venezuela	0	0	1	1	2	III
22. Chile	0	1	1	0	2	III
23. Union of South Africa	0	0	1	1	2	III
24. Yugoslavia	0	1	0	1	2	III
25. Costa Rica	0	1	0	1	2	III
26. Peru	0	0	1	1	2	III
27. Bolivia	0	0	1	1	2	III
28. Spain	0	1	0	1	2	III
29. Brazil	0	0	0	1	1	II
30. Mexico	0	0	0	1	1	II
31. Portugal	0	0	1	0	1	II
32. Ecuador	0	0	0	1	1	II
33. Thailand	0	0	0	1	1	II
34. Burma	0	0	0	1	1	II
35. Morocco	0	0	0	1	1	II

TABLE 2 (Cont.)

Country	Development Characteristics				Total Score	Category of Development
	M	I	A	C		
36. Malaysia	0	0	0	0	0	I
37. Colombia	0	0	0	0	0	I
38. Turkey	0	0	0	0	0	I
39. Guatemala	0	0	0	0	0	I
40. Philippines	0	0	0	0	0	I
41. Honduras	0	0	0	0	0	I
42. U.A.R. (Egypt)	0	0	0	0	0	I
43. Ceylon	0	0	0	0	0	I
44. El Salvador	0	0	0	0	0	I
45. Pakistan	0	0	0	0	0	I
46. India	0	0	0	0	0	I
47. Korea (South)	0	0	0	0	0	I
48. Nigeria	0	0	0	0	0	I
49. Mauritius	0	0	0	0	0	I

Source: Adapted from Magdi M. El-Kammash, "On the Measurement of Economic Development Using Scalogram Analysis," Papers and Proceedings of the Regional Science Association, XI (1963), Table IV, p. 319, and Table V, p. 321.

M:	Infant Mortality	I:	Degree of Illiteracy
A:	Share of Agricultural Sector in Gross Domestic Product	C:	Capital Formation as a Percentage of Gross National Product
1:	Indicates Development	0:	Indicates Underdevelopment

development (I).

For example, taking the case of the United States, the first country listed in Table 2, the country was given a "1" for each of the "Development Characteristics." The United States had a low rate of infant mortality (M) and so it was given a "1" in this column of Table 2. It also had a low level of illiteracy (I), a low share of agricultural sector in Gross Domestic Product (A), and a high share of capital formation as a percentage of Gross National Product (C). Thus, it was given a "1" in each of these categories also. The "1's" for the four vertical columns M, I, A, and C for the United States add up to the total of "4," placing it in the highest category according to level of economic development (Category V).

Conversely, in the case of the Mauritius, the last country listed in Table 2, the country was given a "0" for each of the "Development Characteristics." Thus, the total score for the four vertical columns M, I, A, and C is "0," placing it in the lowest category, according to level of economic development (Category I).

In this manner, a total score of 3 for the "Development Characteristics" would place a country in Category IV of development, a total score of 2 would

place it in Category III of development, and a total

score of 1 would place it in Category II of development.

In Table 2, as might be expected, 16 of the

17 countries in Professor El-Kammash's Category V of

economic development are modern, Western nations, the

exception being Japan, an Asian nation. Two of the 3

countries in his Category IV are from Latin America,

and the other is from southern Europe. Five of the 8

countries in his Category III are from Latin America,

2 are from Europe, and 1 is from Africa.

While 1 of the 7 countries in his Category II

is from Europe (Portugal), the remaining 6 are from

Latin America, Asia, and Africa. The 14 countries in

his Category I are a diversity from Asia, the Middle

East, Latin America, and Africa.

Countries belonging to the same category of

development do, to a great extent, share similar lev-

els of technology, education, and standard of living;

yet, there are differences between these countries with

respect to how far they have utilized these capacities.

This shows up in the outcome of their efforts, that

is, in such things as per capita national product or

per capita national income. Thus, in Table 2, the

countries were grouped into the categories of economic

development on the basis of the total scores of scaling.

The ordering within each group of countries, though,

was then based on the average of 1952-1954 per capita

national product--when estimates of per capita national

product were not available, the countries were placed

at the ends of their respective groups. Per capita

national product was chosen rather than per capita

national income because of the greater availability

of data.[10]

Professor El-Kammash's Categories and
Professor Rostow's Stages

The countries which Professor El-Kammash classi-

fied into various categories of economic development do

not necessarily correspond with the equivalent stages

of Professor Rostow's classification (see Figure 1),

since the selection of limits for Professor Rostow's

stages and Professor El-Kammash's categories are

based on different criteria. For example, few of

the countries in the world today seem to exhibit the

characteristics of Professor Rostow's "traditional

society" stage.[11] Thus, in all probability Professor

El-Kammash's "Category I" does not exactly coincide

with Professor Rostow's lowest category. This probable

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[10]Ibid., pp. 318-321.

[11]Andre Gunder Frank, Rostow's Stages of Eco-
nomic Growth through Escalation to Nuclear Destruction
(Ann Arbor, Michigan: The Radical Education Project),
p. 2.

FIGURE 1

COMPARISON OF PROFESSOR ROSTOW'S AND PROFESSOR
EL-KAMMASH'S STAGES OF ECONOMIC DEVELOPMENT

Professor Rostow's Classification	Countries	Professor El-Kammash's Classification
	Country 1	
	Country 2	
	Country 3	
	. .	
Age of High Mass-Consumption	. .	Category V
	. .	
	. .	
	. .	
	. .	Category IV
	. .	
Drive to Maturity	. .	Category III
	. .	
	. .	
	. .	Category II
	. .	
Take-Off Stage	. .	
	. .	
	. .	Category I
Preconditions Stage	. .	
	. .	
Traditional Society	Country n	
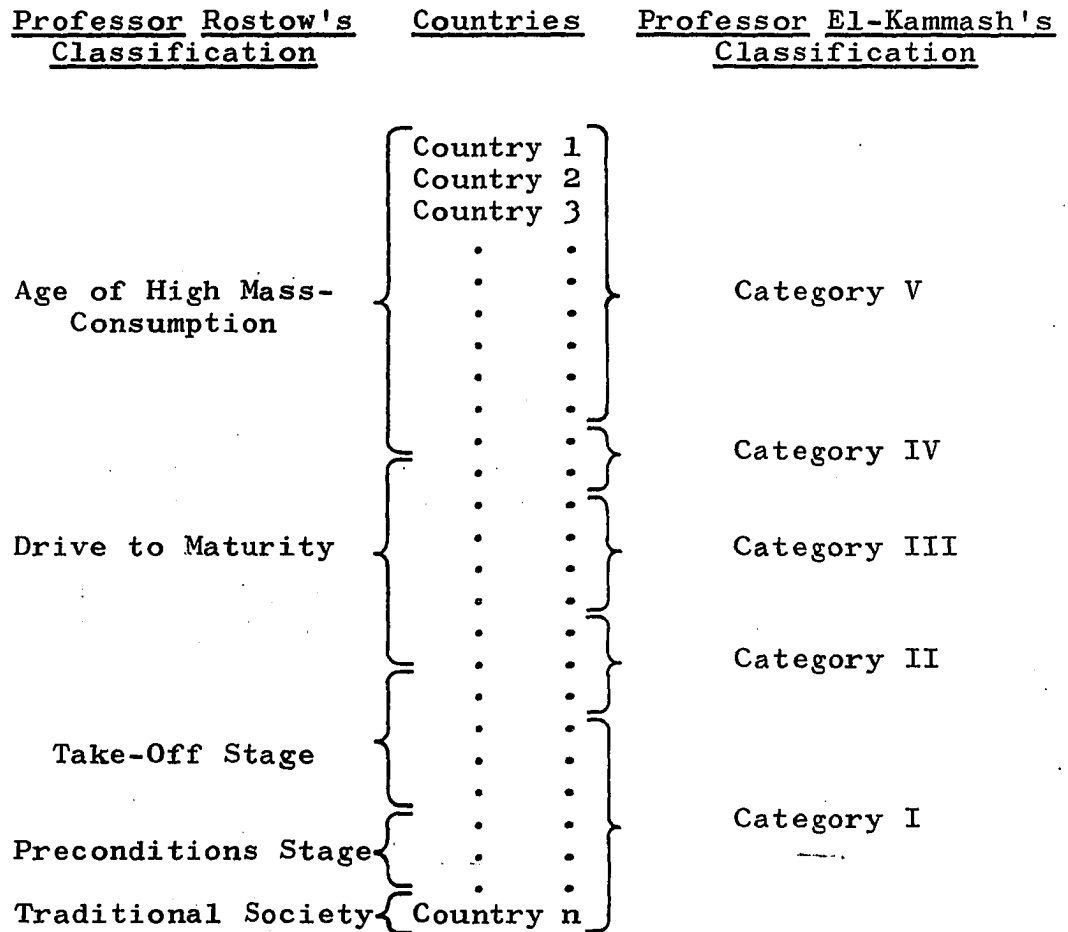
Note: This Figure is intended to illustrate the
fact that Professor Rostow's stages and Professor El-
Kammash's categories do not necessarily coincide, since
the selection of their limits is based on different
criteria.

disparity between Professor Rostow's stages and
Professor El-Kammash's categories is illustrated in
Figure 1. The relationship between Professor Rostow's
stages and Professor El-Kammash's categories may not
be exactly of the sort illustrated in Figure 1, but
the proportional relationships illustrated in Figure 1
seem a likely possibility, for Professor El-Kammash's
49 countries.

Figure 1 has been drawn to indicate that, for
the countries in the world today, Professor Rostow's
lowest three stages of development (his traditional
society, preconditions, and take-off stages) may
roughly coincide with Professor El-Kammash's lowest
category of development (his Category I) and part of
his next highest category of development (his Category
II). This is likely because of the briefness of the
take-off stage and because few countries in the world
today seem to be in Professor Rostow's traditional
society stage. This leaves, then, Professor Rostow's
highest two stages of development (his age of high
mass-consumption and drive to maturity stages) cor-
responding approximately with Professor El-Kammash's
Categories V, IV, III, and part of Category II.

The bracketing, in Figure 1, of varying propor-
tions of the countries into Professor El-Kammash's

different categories is based on the proportions of

the 49 countries in Table 2 that fall into these dif-

ferent categories; while the bracketing, in Figure 1,

of varying proportions of the countries into Professor

Rostow's different stages is subjective and open to

question. The appropriate matching of Professor El-

Kammash's categories and Professor Rostow's stages

for the sample countries, as theorized in Figure 1,

is not crucial for the purposes of this study. What

is important is that the sample countries are ranked

according to level of economic development. It seems

reasonable to expect that the countries lower in this

ranking fall into Professor Rostow's lower stages while

those higher in the ranking fall into his higher

stages, and this study examines the available data in

an attempt to see if a "cluster" of countries near the

bottom of the ranking exhibit characteristics which

Professor Rostow attributes to his take-off stage.

Approach and Scope of the Present Study

In the following chapters of the present study,

most, but not all, of the 49 countries ordered in

Table 2 are used. The availability and accuracy of

the data vary as different types of data are studied;

so, depending on the availability of data for the

particular aspect of Professor Rostow's theory being

examined, some of these 49 countries are used at some times, while others are used at other times. Although some additional information is now available which was not available when Professor El-Kammash originally ranked his 49 countries according to level of economic development, his procedure was not repeated for these few additional countries because of the complexity and difficulty which would have been encountered in fitting additional countries into his ranking.

The approach of this study is to examine the seventeen year span of United Nations national income accounts data available for most of the 49 countries Professor El-Kammash ranked according to level of economic development. In general, "gross" national accounts data are used rather than "net" national accounts data because of greater reliability and availability. Although the quality of the United Nations data used in this study was judged adequate to indicate broad trends and patterns, it was felt, because of the quality limitations of the data, nothing additional would have been gained by attempting to adjust the gross data to approximate net data.

Quality of the Data

The primary source of data for this study consists of various issues of the United Nations Yearbook

<u>of National Accounts Statistics</u> issued since World War

II. For some countries the United Nations national

income accounts data have a high degree of reliability,

while for other countries the reliability of the data

is considerably less, usually the lowest reliability

being associated with data for the least developed

countries.

A great deal of effort has been exerted by

the United Nations to facilitate the international

comparability of the National Accounts data found in

various issues of its <u>Yearbook of National Accounts</u>

<u>Statistics</u>, and the international comparability of this

data is constantly improving.[12] Further information

concerning the compilation and comparability of the

data found in various issues of the United Nations

<u>Yearbook of National Accounts Statistics</u> is available

in <u>National Accounting Practices in Sixty Countries</u>:

<u>A Supplement to the Yearbook of National Accounts Sta-</u>

<u>tistics</u>.[13]

In spite of the drawbacks, the data presently

available appear sufficiently reliable to perform the

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[12]United Nations, <u>Yearbook of National Accounts</u>
<u>Statistics, 1966</u> (New York: Statistical Office of the
United Nations, 1967), p. vii.

[13]United Nations, <u>National Accounting Practices</u>
<u>in Sixty Countries: A Supplement to the Yearbook of</u>
<u>National Accounts Statistics</u> (New York: Statistical
Office of the United Nations, 1964).

tests intended and to give a broad picture of what

is happening in a large part of the world.

CHAPTER VI

GROSS DOMESTIC FIXED CAPITAL FORMATION AS A PERCENTAGE

OF EXPENDITURE ON GROSS DOMESTIC PRODUCT,

SELECTED COUNTRIES

Introduction

In this chapter two aspects of Professor Rostow's

historical stages theory are examined. A major aspect

dealing with his critical take-off stage is dealt with

in the first part of the chapter. Then, a lesser aspect

dealing with his drive-to-maturity stage is dealt with

in the second part of the chapter. Both of these

aspects have been included in this chapter, because

their examination utilizes some of the same data.

The take-off stage is the first major concept

of Professor Rostow's historical stages theory which

he described in his lectures and journal articles.

Also, it is the "keystone" around which he built his

theory. Because of its importance, an examination of

this concept is of particular significance in the

examination of Rostow's theory.

According to Professor Rostow, one of the

major requirements--and a necessary condition--which

must be fulfilled in order for the take-off stage to

occur in a given country is:

> *) A rise in the rate of productive investment
> from, say, 5% or less to over 10% of national
> income (or net national product (NNP)).[1]

In effect, the above statement implies a

"doubling" in net investment as a percentage of net

national product during the take-off stage. Professor

Rostow's explanation of this "requirement" for the

take-off stage stresses the importance of a <u>sharp</u>

<u>rise</u> in investment as a proportion of net national

product over the approximately 20 year take-off period,

and suggests that the 5 per cent and 10 per cent fig-

ures are arbitrary and based on certain technology and

population change assumptions (e.g., population in-

creases of approximately 1-1.5 per cent per year).[2]

It should be noted that Professor Rostow formu-

lated this requirement in terms of <u>net</u> national product

and that in speaking of "productive investment" Rostow

is interpreted by Professor Kuznets and others to mean

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[1] W. W. Rostow, <u>The Stages of Economic Growth:</u>
<u>A Non-Communist Manifesto</u> (Cambridge: Cambridge Uni-
versity Press, 1960), p. 39.

[2] <u>Ibid</u>., p. 41.

net investment.[3]   Also, Rostow here uses the two con-

cepts "national income" and "net national product"

interchangeably.

The 17 year span of United Nations data

available for many of the 49 countries Professor

El-Kammash ranked according to level of economic

development are examined in the present study to see

if a "cluster" of countries, somewhere near the bot-

tom of this ranking, exhibit the above characteris-

tic.

In this study, investment as a percentage of

product was calculated for as many of the 49 countries

Professor El-Kammash ranked according to level of

economic development, and for as many individual years

for these countries, as satisfactory United Nations

data could be found.   After these percentages were

calculated, a linear regression line was fitted to

the percentages for each country and projected the

number of additional years necessary to total a 20

year period.   The percentage change in investment as

a percentage of product over the 20 year period for

each of these countries was then calculated using

these linear regression lines.   A 20 year period was

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[3]Simon Kuznets, Economic Growth and Structure:
Selected Essays (New York: W. W. Norton & Company,
1965), p. 221.

chosen for three reasons. First, this is a reasonable interpretation of the length of time required for Professor Rostow's take-off stage to occur. Second, with spans of data up to seventeen years in length available, it would require, at a minimum, a projection of only three years. Third, projecting the available data of each of these countries to a period totaling 20 years in length leads to a "comparability" of the change in investment as a percentage of product for each of these countries because of the similarity of time span.

In addition, the present chapter examines Professor Rostow's statement that, during the drive-to-maturity stage, "some 10-20% of the national income is steadily invested. . . ."[4] This analysis compares the relative magnitudes of mean values of investment as a percentage of product calculated from the series of available data for each of the countries along Professor El-Kammash's ranking.

Both these aspects of Professor Rostow's theory are examined using "gross domestic fixed capital formation" as a percentage of "gross domestic product." Gross data are used rather than net data because of greater reliability and availability. Net capital

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[4]Rostow, p. 9.

formation data are often arbitrary and vary from coun-

try to country in the manner in which they are cal-

culated--reflecting the varying practices from country

to country in calculating "depreciation."

Data for gross <u>domestic</u> product are used in

this study rather than data for gross <u>national</u> product

or data for <u>national</u> income because of greater avail-

ability. The trends in the data are the aspects

intended for measurement, and the slight differences

between these concepts do not affect the results

of the present study.

The Procedure Used to Examine These Aspects
of Professor Rostow's Theory

The data for gross domestic fixed capital

formation and for gross domestic product used in exam-

ining these two aspects of Professor Rostow's theory

were obtained from various issues of the United Nations

<u>Yearbook of National Accounts Statistics</u>. In most

cases, issues for the years 1957, 1958, 1959, 1961,

1962, 1966, and 1967 were used, because no one of

these provided the complete range of data needed.

Often, the data for a given country and year were

available in several of the issues, but the data from

the most recent <u>Yearbook</u> in which they could be found

were always used, because the United Nations data

are continuously being revised.

The United Nations <u>Yearbook of National Accounts</u>

<u>Statistics</u> defines "gross domestic product" as follows:

> <u>Gross domestic product at market prices</u> is the
> market value of the product, before deduction of
> provisions for the consumption of fixed capital,
> attributable to factor services rendered to resi-
> dent producers of the given country. It is identi-
> cally equal to the sum of consumption expenditure
> and gross domestic capital formation, private and
> public, and the net exports of goods and services
> of the given country. It differs from the gross
> national product at market prices by the exclusion
> of net factor incomes received from abroad.[5]

Similarly, the United Nations <u>Yearbook of</u>

<u>National Accounts Statistics</u> defines "gross domestic

fixed capital formation" as follows:

> Value of purchases and own-account construction
> of fixed assets (civilian construction and works,
> machinery and equipment) by enterprises (includ-
> ing households in their capacity as house owners),
> private non-profit institutions and general gov-
> ernment. Expenditure of a capital nature by gen-
> eral government for defence (excluding civil
> defence) is treated as general government consump-
> tion expenditure. Expenditure by households on
> durable goods other than new dwellings is treated
> as private consumption expenditure.
>
> All expenses directly related to the acquisi-
> tion of capital goods, such as transportation and
> installation charges, fees for engineering, archi-
> tectural, legal and other services, are included.
> Indirect expenditures, including flotation costs,
> commissions and other financing costs are, on the

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[5] United Nations, <u>Yearbook of National Accounts
Statistics, 1966</u> (New York: Statistical Office of the
United Nations, 1967), p. xi.

other hand, regarded as current expenditures.

Expenditures on irrigation projects, flood
control, forest clearance, land reclamation and
improvement, etc., and on the development of
plantations, orchards, vineyards, forests, etc.,
are included. The value of newly discovered
mineral deposits and other natural resources is,
on the other hand, excluded.

In principle, expenditures on repairs over and
above what is needed to keep the capital goods in
the state of continuous good working condition
are included but normal repairs and maintenance
are treated as current expenditure.

Transfer costs involved in the purchase of used
domestic assets, including transportation costs,
legal fees, installation expenses, etc., are part
of fixed capital formation. Changes in work in
progress on dwellings and non-residential buildings
are also included.[6]

Calculations

After the data for "gross domestic fixed capi-

tal formation" and for "gross domestic product" were

obtained, "Gross Domestic Fixed Capital Formation as

a Percentage of Gross Domestic Product" was calcu-

lated for those countries of Table 2, Chapter V, for

which reasonably good data were found. Because of inade-

quate data, three countries were omitted from those in

Table 2. One country, Spain, was eliminated from Cate-

gory III of development; and two countries, Egypt and

India, were eliminated from Category I of development.

-----

[6]Ibid., pp. xvii-xviii.

Thus, 46 countries remained of the 49 originally

listed in order of economic development in Table 2.

Based on United Nations population estimates for 1967,

these 46 countries contain somewhat more than one third

of the world's population.[7]

    For many of the countries selected for exami-

nation, enough data were available to permit the cal-

culation of percentages covering a 17 year span of

time. For the remaining countries, data for lesser

spans of time were available, but generally enough

data were available to permit the calculation of per-

centages covering spans of time long enough to be use-

ful. These calculations resulted in the percentages

contained in Table 3, wherein 46 countries are ordered

according to level of economic development. For a

number of these countries, there was a changeover

from an older series of data to a newer series of

data; for the present study, these were labeled

"Series A" and "Series B," respectively. Although 46

countries are represented in Table 3 there are 56

entries under the column labeled "Country" because of

the "Series A" and "Series B" designations of the data.

---

[7]Calculated using data from United Nations,
Demographic Yearbook, 1967 (New York: Statistical
Office of the United Nations, 1968).

TABLE 3

GROSS DOMESTIC FIXED CAPITAL FORMATION AS A PERCENTAGE OF EXPENDITURE ON
GROSS DOMESTIC PRODUCT, SELECTED COUNTRIES, 1950-1966

Country Number	Series of Data	Country	Category of Development	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
1	A	United States	V	17.7	16.4	15.8	16.5	16.5	17.7	18.1	17.8	17.0	17.5	16.9	16.3	16.6	16.7	16.9	17.3	17.1
2	A	Canada	V	20.8	21.5	21.2	22.7	22.2	22.2	25.3	26.5	24.8	23.4	22.2	21.2	21.0	21.2	22.7	24.2	25.4
3	A	Switzerland	V	--	--	--	17.9	(18.6)	19.4	20.8	21.5	20.0	21.7	23.7	26.4	27.8	28.9	29.8	28.1	27.0
4	A	New Zealand	V	17.6	19.8	22.3	22.0	23.1	22.9	22.1	22.7	21.9	21.2	22.5	23.0	21.7	22.1	22.8	23.6	22.8
5	A	Sweden	V	18.5	18.4	19.0	20.4	20.9	19.9	19.9	19.9	19.9	20.9	21.6	22.0	22.4	22.5	23.1	23.1	23.0
6	A	Australia	V	23.9	29.2	24.7	23.3	26.1	23.9	22.9	24.3	23.8	24.1	24.5	24.3	24.3	24.7	26.1	27.1	25.6
7	A	Luxembourg	V	23.8	16.6	17.1	23.7	22.8	21.7	19.3	23.2	23.5	22.9	--	--	--	--	--	--	--
7	B	Luxembourg	V	--	--	--	--	--	--	--	--	--	--	21.9	24.7	27.4	31.8	35.5	--	--
8	A	Belgium	V	--	13.7	14.0	16.1	16.0	17.1	18.3	17.7	16.8	17.6	18.9	20.0	20.4	19.9	21.3	21.1	21.5
9	A	United Kingdom	V	13.0	12.8	12.9	14.0	14.0	14.8	14.8	15.5	15.3	15.6	16.2	17.0	16.6	16.2	17.9	18.0	17.9
10	A	Denmark	V	16.7	17.4	18.2	17.0	16.9	16.0	16.3	16.9	17.2	18.8	19.4	20.6	20.8	19.8	21.8	21.8	21.3
11	A	Norway	V	--	24.1	26.4	30.1	29.8	30.5	27.9	28.9	32.1	29.4	28.5	29.6	29.2	29.7	27.9	28.4	28.5
12	A	France	V	16.2	16.8	16.6	16.3	16.3	17.8	18.1	19.5	19.2	19.0	18.6	19.7	19.7	20.1	21.2	21.7	21.8
13	A	Finland	V	23.5	23.7	26.7	27.3	25.7	25.5	26.0	24.3	24.8	25.5	27.3	28.0	27.4	25.7	24.4	26.0	25.4
14	A	West Germany	V	19.0	18.7	19.1	19.8	21.0	22.5	22.5	21.5	21.8	23.1	--	--	--	--	--	--	--
14	B	West Germany	V	--	--	--	--	--	--	--	--	--	--	23.8	24.7	25.4	25.2	26.3	26.3	25.4
15	A	Netherlands	V	20.0	19.5	18.9	21.2	21.3	22.9	25.2	25.7	22.7	23.6	23.8	24.4	24.1	23.7	25.2	24.9	25.5
16	A	Austria	V	19.0	20.9	19.5	17.2	20.6	22.8	21.2	21.9	21.8	22.6	23.7	24.7	24.5	24.5	24.8	25.6	26.1
17	A	Japan	V	16.2	19.7	20.3	22.5	20.4	20.0	24.1	27.3	26.3	27.0	31.0	34.8	34.3	32.6	33.0	31.6	31.4
18	A	Argentina	IV	--	22.0	20.1	17.5	17.7	17.6	18.4	20.1	20.0	16.9	21.7	23.5	22.7	18.2	16.5	17.2	17.9
19	A	Puerto Rico	IV	16.3	17.1	17.0	17.2	19.1	18.9	20.9	20.8	20.1	20.9	20.3	21.5	21.2	23.0	25.6	23.9	25.2
20	A	Italy	IV	17.6	18.5	19.7	19.1	19.5	20.4	20.6	21.6	20.6	21.0	22.2	22.9	23.4	23.8	21.9	19.0	18.6
21	A	Venezuela	III	14.7	16.1	22.5	28.9	30.5	24.6	25.0	25.0	24.3	23.7	--	--	--	--	--	--	--
21	B	Venezuela	III	--	--	--	--	--	--	--	--	--	--	18.7	16.1	16.3	16.5	17.6	18.7	19.0
22	A	Chile	III	9.0	9.7	9.5	9.1	8.3	8.4	8.3	10.7	10.4	9.6	10.3	--	--	--	--	--	--
22	B	Chile	III	--	--	--	--	--	--	--	--	--	--	15.4	16.8	15.4	17.1	16.6	15.9	15.6
23	A	Union of South Africa	III	--	--	26.0	24.9	23.1	21.5	20.1	20.7	22.9	21.0	20.4	19.5	18.0	19.5	21.5	23.8	23.6
24	A	*Yugoslavia	III	--	--	30.2	32.0	32.6	28.9	28.6	27.6	29.5	30.7	32.4	34.6	35.3	34.6	33.4	27.4	25.5
25	A	Costa Rica	III	15.4	16.6	17.7	17.6	19.1	17.1	18.6	19.3	--	--	--	--	--	--	--	--	--
25	B	Costa Rica	III	--	--	--	--	--	--	--	18.6	18.5	19.4	19.0	18.0	20.9	20.9	18.3	22.7	20.3
26	A	Peru	III	--	--	23.7	23.2	21.0	18.5	23.3	24.8	22.9	17.8	16.8	19.2	20.6	18.8	17.1	19.3	--
27	A	Bolivia	III	--	--	--	--	--	--	--	--	14.5	13.6	14.2	10.9	15.7	16.1	14.8	14.4	11.7
28	A	Brazil	II	--	18.1	18.4	13.0	16.4	14.3	13.2	13.1	13.8	15.9	16.5	17.2	16.3	16.5	14.3	10.7	12.8
29	A	Mexico	II	--	--	--	13.8	(14.0)	14.3	16.7	16.5	14.7	14.2	14.9	14.5	13.8	14.4	16.1	15.8	16.5
30	A	Portugal	II	--	--	14.0	13.8	14.3	13.5	13.8	14.5	15.7	16.0	17.3	17.5	16.6	17.9	17.1	17.3	18.5
31	A	Ecuador	II	8.5	11.0	9.1	10.7	13.2	13.9	13.8	13.0	12.3	13.3	--	--	--	--	--	--	--
31	B	Ecuador	II	--	--	--	--	--	--	--	--	--	--	13.4	13.6	12.2	12.3	12.0	11.9	--
32	A	Thailand	II	--	--	--	14.4	14.2	13.3	13.1	--	--	--	--	--	--	--	--	--	--
32	B	Thailand	II	--	--	--	--	--	--	--	14.0	13.7	14.3	14.9	15.6	18.2	21.6	22.3	22.6	22.3
33	A	Burma	II	10.5	11.7	14.9	14.5	18.2	20.0	21.2	20.8	20.7	17.9	15.9	15.0	15.7	16.5	15.7	--	--
34	A	Morocco	II	--	22.9	24.4	18.3	18.2	14.2	11.2	9.6	10.0	9.2	10.1	11.6	10.8	11.9	11.1	11.0	--
35	A	Malaysia	I	6.2	6.6	10.3	10.0	(9.6)	9.2	11.0	12.3	11.8	10.5	12.3	14.8	17.7	17.6	17.0	16.6	--
36	A	Colombia	I	8.5	9.7	10.1	10.9	10.5	10.1	10.3	8.4	--	--	--	--	--	--	--	--	--
36	B	Colombia	I	--	--	--	16.6	16.9	18.0	17.0	14.8	16.1	16.6	18.3	18.4	18.2	17.1	16.7	15.9	--
37	A	Turkey	I	9.4	10.2	12.5	12.1	14.4	14.4	13.8	12.7	12.7	13.9	14.7	14.5	14.4	13.8	13.4	13.6	14.9
38	A	Guatemala	I	--	--	--	8.1	(9.0)	9.8	14.9	16.0	14.1	11.4	10.1	14.4	9.9	10.3	12.1	12.5	12.3
39	A	Philippines	I	7.3	6.6	6.4	6.9	6.8	7.1	8.1	8.8	8.1	8.2	9.9	12.8	12.5	12.9	14.4	13.6	--
40	A	Honduras	I	10.8	12.4	16.2	16.0	12.9	13.3	12.6	13.7	12.7	11.9	12.7	11.0	13.2	14.5	13.9	13.5	13.7
41	A	Ceylon	I	8.7	9.3	12.0	10.1	8.7	9.8	15.1	--	--	--	--	--	--	--	--	--	--
41	B	Ceylon	I	--	--	--	--	--	--	--	--	15.9	15.6	14.6	14.3	14.6	14.9	14.1	12.9	14.1
42	A	El Salvador	I	--	--	--	--	--	--	--	--	11.9	11.9	14.4	11.6	11.8	11.9	14.1	14.9	15.4
43	A	Pakistan	I	--	--	--	--	--	--	--	--	--	9.2	11.8	13.9	15.6	17.0	17.2	14.6	--
44	A	South Korea	I	--	--	--	7.3	11.1	10.2	10.3	10.7	10.1	11.0	10.8	11.7	14.1	14.0	11.6	14.7	20.2
45	A	Nigeria	I	--	6.4	8.6	8.6	9.0	10.1	11.2	12.0	--	--	--	--	--	--	--	--	--
45	B	+Nigeria	I	--	--	--	--	--	--	--	--	12.6	13.6	14.0	14.5	13.9	14.6	16.0	--	--
46	A	Mauritius	I	14.7	14.4	13.0	15.4	12.8	13.9	12.0	13.4	16.7	16.6	21.9	18.7	17.1	15.0	19.1	16.8	14.6

( ) Designates data calculated by averaging the data for the year immediately preceding, and the year immediately following, a year for which no data were available.

-- Reliable data not available (For this series of data)

* The percentages for Yugoslavia were calculated using "Expenditure on Gross Material Product," a somewhat similar, but not strictly comparable concept to "Expenditure on Gross Domestic Product."

+ The percentages for Nigeria Series B were calculated using "Gross Domestic Product at Factor Cost," a somewhat similar, but not strictly comparable concept to "Expenditure on Gross Domestic Product."

Source: Calculated from data found in the United Nations, Yearbook of National Accounts Statistics, 1957, 1958, 1959, 1961, 1962, 1966, and 1967.

Also, as was the case in Table 2, in Table 3 "Category

of Development" designations are indicated for the

various countries falling into Professor El-Kammash's

categories of economic development.

In Table 3, looking at the ranges of available

data for "Gross Domestic Fixed Capital Formation as a

Percentage of Gross Domestic Product" for the coun-

tries listed, in almost all cases there is an increase

from the first year to the final year. In the present

study, the changes between these first and final years

could have been examined; but a method which provides

more comprehensive information concerning the changes

involved is to fit a linear regression line to the

data for each country, so as to derive the benefits

of using the trend over the whole series of years

rather than just the change between the first and

final years. Also, by using this procedure, changes

in these fitted linear regression lines, of the form

$Y = a + bX$, can easily be examined over a similar

period of time, thus making the changes comparable.

The data in Table 3 for "Gross Domestic Fixed

Capital Formation as a Percentage of Gross Domestic

Product" are the bases for the empirical examination

of Professor Rostow's theory conducted in this chapter.

Using the data in Table 3, a linear regression line

was fitted to the available span of percentages for

each country to see if the fitted linear regression
line, when examined for a time period totaling 20
years in length, would amount to a doubling of
"Gross Domestic Fixed Capital Formation as a Per-
centage of Gross Domestic Product."

In a typical case (United Kingdom, Figure 2),
a linear regression line was fitted to a 17 year span
of data. This linear regression line was then pro-
jected an additional 3 years to see what percentage
change (Figure 2, $\frac{AB}{BC}$ x 100) could be expected over a
20 year period. A 17 year span of data was not avail-
able in all cases (e.g., 14-16 year spans of data
were fairly common), but in every case a linear
regression line was fitted to the available data for
each country and then projected the number of additional
years necessary to have a period totaling 20 years.
Also, in calculating the linear regression lines for
each country the first year of available data was
considered to be "year 1," regardless of the actual
year in which the data were first available.

In attempting to fit the linear regression
lines to the data in Table 3, a minor problem was
encountered in the form of changeovers from an older
series to a newer one. This occurred for 10 countries--
as indicated by the "Series A" and "Series B" designa-
tions. A discussion of the manner in which the present

FIGURE 2

GROSS   DOMESTIC   FIXED   CAPITAL   FORMATION
IN THE   UNITED   KINGDOM   AS   A   PERCENTAGE
OF GROSS   DOMESTIC   PRODUCT,   ANNUALLY,
1950 - 1969
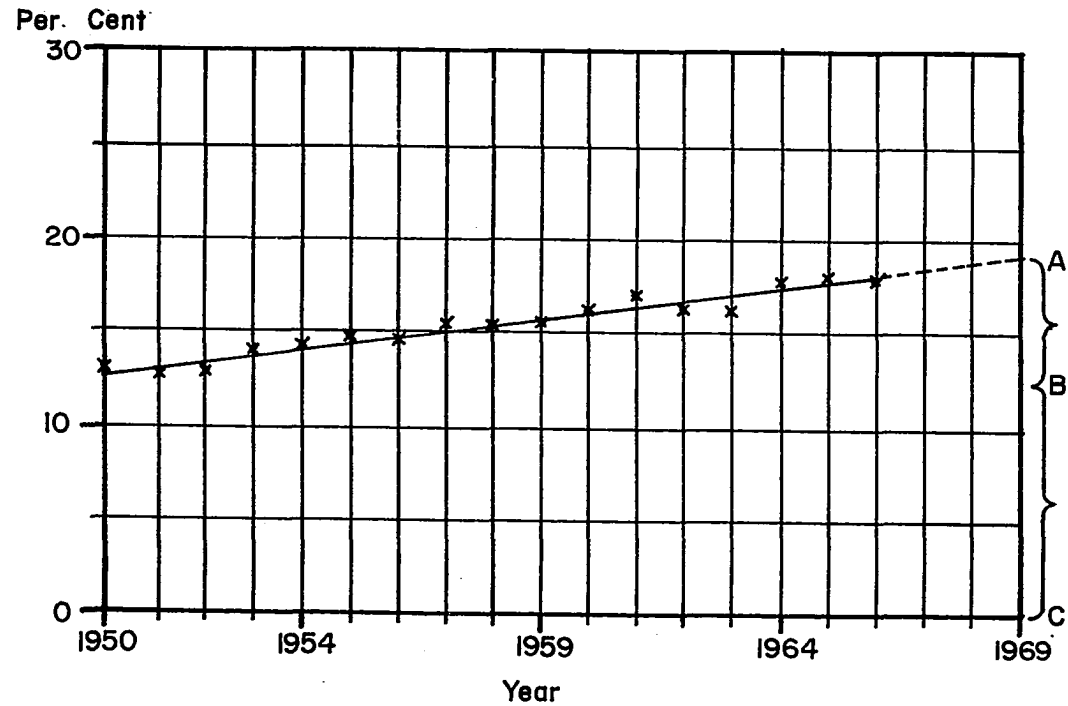
Source: Data   from   Table   3
– – – – Extrapolation

study deals with this problem is contained in the
Appendix of this chapter.

Another minor problem encountered was the unavail-
ability of data for some specific years. This occurred
within the spans of data available for three countries:
Switzerland, Malaysia, and Guatemala. This problem was
solved by averaging the data of the year immediately
preceding and the year immediately following the year
which lacked data. Since there were no sharp fluctua-
tions in the data of these countries, this was deemed a
reasonable method to use. In Table 3 the process of
averaging to arrive at the missing data is indicated by
the use of parenthesis symbols around the 1954 percent-
age data for Switzerland, Malaysia, and Guatemala.

Using the data in Table 3, the following infor-
mation was calculated:

1) the Y-intercept and the slope (a and b
   respectively of the linear equation Y =
   a + bX) of the linear regression line fit-
   ted to each series of data;

2) the coefficient of correlation of each fit-
   ted linear regression line;

3) the mean, or average, value for each series
   of data;

4) the standard error for each series of data;

5) based on the fitted linear regression

lines, the percentage change in "Gross
Domestic Fixed Capital Formation as a Per-
centage of Gross Domestic Product" for each
series of data over a time period totaling
20 years.

Much of this information has been included in Table 4,
with the remainder included in later tables.

In the first column of Table 4 are numbers indi-
cating the ordinal relationship of the sample countries--
with larger numbers connoting lower levels of economic
development. Similarly, in the third column are Profes-
sor El-Kammash's Category of Development designations
for these countries. The fourth column contains the
mean values for the available data in each series.
The fifth, sixth, and seventh columns contain the Y-
intercept, slope, and standard error, respectively, of
the linear regression lines fitted to the series of
data in Table 3. An explanation of why this informa-
tion has not been included in Table 4 for all of the
countries is contained in the Appendix of the present
chapter.

It may be observed in Table 4 that in most
cases the standard errors of the fitted linear regres-
sion lines are relatively small. This indicates that
these regression lines are reasonably good approxima-
tions of the data.

TABLE 4

REGRESSION VALUES AND RELATIVE PERCENTAGE CHANGES IN GROSS DOMESTIC
FIXED CAPITAL FORMATION AS A PERCENTAGE OF GROSS DOMESTIC
PRODUCT OVER 20 YEAR PERIOD

Country Number	Country	Category of Develop- ment	Mean Value of Data	Fitted Linear Regression Line			Percentage Change in Ratio over 20 Year Period
				Y- intercept	Slope	Standard Error	
1	United States	V	17.0	16.9	0.006	0.605	0.8
2	Canada	V	22.9	22.0	0.098	1.658	8.9
3	Switzerland	V	23.7	16.7	0.936	1.425	112.3
4	New Zealand	V	22.0	20.6	0.161	1.139	15.7
5	Sweden	V	21.1	18.3	0.311	0.501	34.0
6	Australia	V	24.9	24.6	0.028	1.497	2.2
7	Luxembourg*	V	--	--	--	--	Over 100
8	Belgium	V	18.1	13.9	0.496	0.683	71.3
9	United Kingdom	V	15.4	12.4	0.335	0.369	53.8
10	Denmark	V	18.6	15.5	0.345	1.022	44.4
11	Norway	V	28.8	28.0	0.092	1.684	6.5
12	France	V	18.7	15.5	0.357	0.534	45.9
13	Finland	V	25.7	25.1	0.068	1.239	5.4
14	West Germany*	V	--	--	--	--	Under 100
15	Netherlands	V	23.1	19.9	0.350	1.227	35.1
16	Austria	V	22.4	18.4	0.453	0.980	49.4
17	Japan	V	26.6	16.8	1.091	2.257	129.9

TABLE 4 (Cont.)

Country Number	Country	Category of Development	Mean Value of Data	Fitted Linear Regression Line			Percentage Change in Ratio over 20 Year Period
				Y-intercept	Slope	Standard Error	
18	Argentina	IV	19.2	19.8	-0.063	2.141	-6.4
19	Puerto Rico	IV	20.5	15.8	0.526	0.843	66.6
20	Italy	IV	20.6	19.0	0.181	1.528	19.1
21	Venezuela*	III	--	--	--	--	Under 100
22	Chile*	III	--	--	--	--	Under 100
23	Union of South Africa	III	21.8	23.2	-0.181	2.002	-15.6
24	Yugoslavia	III	30.9	30.8	0.012	2.868	0.8
25	Costa Rica*	III	--	--	--	--	Under 100
26	Peru	III	20.5	23.5	-0.393	2.022	-33.6
27	Bolivia	III	14.0	14.2	-0.040	1.611	-5.6
28	Brazil	II	15.0	16.5	-0.174	1.957	-21.0
29	Mexico	II	15.0	14.3	0.091	0.966	12.8
30	Portugal	II	15.9	13.0	0.358	0.638	55.0
31	Ecuador*	II	--	--	--	--	Under 100
32	Thailand*	II	--	--	--	--	Over 100
33	Burma	II	16.6	14.9	0.213	2.966	28.6
34	Morocco	II	13.6	20.4	-0.840	3.092	-82.5

TABLE 4 (Cont.)

Country Number	Country	Category of Develop- ment	Mean Value of Data	Fitted Linear Regression Line			Percentage Change in Ratio over 20 Year Period
				Y- intercept	Slope	Standard Error	
35	Malaysia	I	12.1	6.0	0.722	1.309	242.2
36	Colombia*	I	--	--	--	--	Under 100
37	Turkey	I	13.3	11.4	0.208	1.096	36.6
38	Guatemala	I	11.8	10.9	0.111	2.264	20.4
39	Philippines	I	9.4	4.7	0.549	1.076	232.1
40	Honduras	I	13.2	13.2	0.006	1.403	0.9
41	Ceylon*	I	--	--	--	--	Under 100
42	El Salvador	I	13.1	11.2	0.378	1.100	67.5
43	Pakistan	I	14.2	9.9	1.075	1.579	217.5
44	South Korea	I	12.0	7.6	0.588	1.719	155.1
45	Nigeria*	I	--	--	--	--	Over 100
46	Mauritius	I	15.7	13.3	0.258	2.159	38.7

Source: Calculated from data in Table 3.

*Two series of data were available for this country. A discussion of how the series were consolidated and the results were obtained is contained in the Appendix of this chapter.

Results Relating to Take-Off Stage

The data contained in the final column of Table
4 are those which are most relevant to Professor Ros-
tow's take-off stage. In this column one may observe
which countries in the sample experienced an increase
of 100 per cent or more in investment as a percentage
of product based on the fitted linear regression lines.
If Professor Rostow's statement concerning the take-
off stage is correct, a "cluster" of countries some-
where near the bottom of the ranking in Table 4 should
have experienced this increase.

In Table 4, three of the 17 countries in Cate-
gory V of development--Switzerland, Luxembourg, and
Japan--experienced a 100 per cent increase; while none
of the three countries in Category IV of development
and none of the seven countries in Category III of
development had as much as 100 per cent increase. One
of the seven countries in Category II of development,
Thailand, experienced a 100 per cent increase.

Finally, five of the 12 countries in Category
I of development (one of the categories most likely to
contain countries in Professor Rostow's take-off stage)
had a 100 per cent or more increase. These countries
were Malaysia, Philippines, Pakistan, South Korea, and
Nigeria.

Analysis Relating to Take-Off Stage

Table 5 contains only those countries from Table 4 which had an increase of 100 per cent or more. In the next to the last column of Table 5 it may be seen that the coefficients of correlation of the linear regression lines fitted to the data for these countries are generally high. Coefficient of correlation information has not been provided for some of the countries in Table 5 (designated by an asterisk) because they had two series of data.[8]

The coefficient of correlation was calculated for the linear regression line fitted to the data of each country, but this information has only been reported for some of the countries (i.e., those not having two series of data) which had increases of 100 per cent or more. This information has not been provided for the rest of the countries in Table 4, because in most cases it proved to be of little value.

Many of the countries in the sample examined had data and fitted linear regression lines that, when graphed, proved to be horizontal, or very nearly so. The formula for calculating coefficients of correlation is so comprised that under such circumstances of

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[8]Information dealing with how the calculations for these countries were conducted is contained in the Appendix of this chapter.

TABLE 5

COUNTRIES IN THE SAMPLE HAVING A DOUBLING OF "GROSS DOMESTIC FIXED
CAPITAL FORMATION AS A PERCENTAGE OF GROSS DOMESTIC
PRODUCT" OVER 20 YEAR PERIOD

Country Number	Country	Category of Develop- ment	Percentage Change over 20 Year Period	Coefficient of Correlation of Fitted Line	Total Number of Years for Which Data Were Available
3	Switzerland	V	112.3	0.935	13
7	Luxembourg*	V	Over 100	--	15
17	Japan	V	129.9	0.921	17
32	Thailand*	II	Over 100	--	14
35	Malaysia	I	242.2	0.931	15
39	Philippines	I	232.1	0.920	16
43	Pakistan**	I	217.5	0.806	7
44	South Korea	I	155.1	0.809	14
45	Nigeria*	I	Over 100	--	14

Source: Calculated from data in Table 3.

*A discussion of how the estimates for these countries were determined is contained in the Appendix of the present chapter.

**The information for Pakistan was calculated using only a seven year span of data.

horizontal, or nearly horizontal, data the formula
yields low values which indicate "no relationship"
even though a close relationship may exist. If the
data and fitted regression lines have sufficient slope,
the formula yields valid results. In this study, the
coefficient of correlation information is of greatest
importance for countries having a doubling of "Gross
Domestic Fixed Capital Formation as a Percentage of
Gross Domestic Product" over a 20 year period; and,
for most of these cases, this information has been
included in Table 5.

In the final column of Table 5 are listed
the number of observations upon which the calcula-
tions arriving at a percentage change over a 20 year
period are based. The results for Pakistan (designated
by a double asterisk) have been included in Table 5
only as a matter of interest, because they are based
on calculations using only a seven year span of data.

Contained in Table 6 are the number of coun-
tries in the sample which fall into each of the cate-
gories of development. Also contained here is the
number of countries in these categories having an
increase of 100 per cent or more, except that Pakistan
was omitted because the calculations for Pakistan
were based on only a seven year span of data. Thus
in Table 6, four rather than five of the 12 countries

TABLE 6

NUMBER OF COUNTRIES IN VARIOUS CATEGORIES OF
DEVELOPMENT HAVING A DOUBLING OF "GROSS
DOMESTIC FIXED CAPITAL FORMATION AS A
PERCENTAGE OF GROSS DOMESTIC
PRODUCT" OVER 20 YEAR PERIOD

Category of Development	Number of Countries in Category	Number of Countries in Category Having a Doubling of "Gross Domestic Fixed Capital Formation as a Percentage of Gross Domestic Product"
V	17	3
IV	3	0
III	7	0
II	7	1
I	12	4*
Total	46	8

Source: Calculated from data in Table 4.

*Pakistan was excluded from the group of countries in Category I of development considered as having a 100 per cent increase, because its projected increase was based on only a seven year span of data.

in Category I of development were considered as having
a 100 per cent increase. Even so, Category I, with
one third of its countries experiencing a 100 per cent
increase, had a higher proportion of its countries
experiencing this increase than any of the other cate-
gories. Category V was next, with three of its 17
countries experiencing a 100 per cent increase, fol-
lowed by Category II, with one of its seven countries
experiencing a 100 per cent increase. None of the
countries in Categories III and IV experienced an
increase as high as 100 per cent.

In terms of the discussion in the earlier
chapters, it appears that few countries in the world
today--and, thus, of the countries examined in the
present study--are in Professor Rostow's lowest (tra-
ditional society) stage of development. Because of
this, and because of the briefness of the take-off
stage, this tends to put Professor Rostow's precondi-
tions and take-off stages near the bottom of the rank-
ing of countries examined in the present study--in the
vicinity of Category I. Also, some of the countries
in Category I of development are likely to be in Pro-
fessor Rostow's preconditions stage, while others are
likely to be in the take-off stage.

Based on these considerations, the relatively
high proportion of countries in Category I experiencing

a doubling of investment as a percentage of product
lends support to Professor Rostow's statement that this
occurs during the take-off stage. Referring to Table
6, a cluster of countries near the bottom of the rank-
ing--in the vicinity of Category I--experienced this
doubling. In fact, nearly twice as high a proportion
of the Category I countries (one third) experienced a
100 per cent increase as was the case for the category
having the next highest proportion (Category V, with
roughly one sixth). Category I contained approximately
one fourth of the countries in the sample examined,
and yet it contained half of the countries experiencing
a 100 per cent increase.

It should be noted that none of the countries
in Categories III and IV experienced an increase of
as much as 100 per cent. This indicates a slowing
down in the rate of growth of investment as a percent-
age of product as countries advance beyond the take-
off stage.

Another Way of Analyzing this Aspect

Another way of looking at this was to average
the values for the increases in investment as a percent-
a g e of product ("Gross Domestic Fixed Capital Forma-
tion as a Percentage of Gross Domestic Product") for
the countries in each of the five categories of

development. Where a country had two series of data,
the two values were averaged, and the single value was
used. This was possible because the necessary informa-
tion had been calculated for each series of data using
the same procedure as when a country had only one
series of data.

These average values for each category of
development are contained in Table 7, where the average
value was the highest for the countries in Category I
of development. The average percentage increase for
Category I was 103.8 per cent. This was double the
percentage increase in the category having the next
highest increase--Category V, with a 50.8 per cent
increase. The next highest increase was 26.4 per cent
for Category IV, followed by an increase of 13.8 per
cent for Category II. The smallest increase was 8.7
per cent for the countries in Category III of develop-
ment.

These results are comparable to those found
in the previous analysis. In the first analysis, the
proportion of countries in Category I having a 100
per cent increase was approximately double that of the
proportion in Category V; while in the second analy-
sis, the average percentage increase for the countries
in Category I was approximately double that for the
countries in Category V. In the first analysis the

TABLE 7

PERCENTAGE CHANGE OF "GROSS DOMESTIC FIXED CAPITAL
FORMATION AS A PERCENTAGE OF GROSS DOMESTIC
PRODUCT" OVER 20 YEAR PERIOD, AVERAGE BY
CATEGORY OF DEVELOPMENT

Category of Development	Percentage Change of Gross Domestic Fixed Capital Formation as a Percentage of Gross Domestic Product over 20 year Period, Average by Category of Development
V	50.8
IV	26.4
III	8.7
II	13.8
I	103.8

Source: Calculated from data in Table 4.

most frequent 100 per cent increases, and in the second
analysis the greatest average percentage increases,
occurred in Categories V and I--the categories at the
extreme high and low levels in terms of economic
development. Also, both analyses indicate a distinc-
tive difference between Categories I and II--in the
proportion of countries having a 100 per cent increase
in the first analysis, and in the average percentage
increase in the second analysis.

Interpretation

A number of critics in their appraisals of
Professor Rostow's theory, and of his take-off stage
in particular, have contended that no valid empirical
evidence has been found indicating that distinguish-
able breaks, or changes, occur over short spans of
time--in the manner suggested by Professor Rostow--
as nations move along the path toward economic devel-
opment. They felt that the changes which nations go
through occur slowly, or by degree; and apparently
they considered the limited evidence Professor Rostow
cited in his book and elsewhere to be insufficient.[9]

[9]Henri Baudet and J. H. van Stuijvenberg,
"Rostow's Theory on Growth," Weltwirtschaftliches
Archiv, Vol. XC, Hft. 1 (1963), pp. 72-73; A. K.
Cairncross, "The Stages of Economic Growth," Economic
History Review, Second Series, Vol. XIII, No. 3 (April,

Professor Kuznets and others, in their empiri-
cal examinations of the long-term, historical evi-
dence on the economic development of a few, presently
developed, Western nations, found no evidence indi-
cating the occurrence of distinct changes over short
spans of time. These studies faced the problem, how-
ever, of a scarcity of usable data covering the earli-
est time periods--especially the critical take-off
stages--of these countries.

The present study found that distinct differ-
ences in the percentage changes of investment as a
percentage of product over a short span of time were
observable for groups of nations at various levels of
economic development in the sample of countries exam-
ined. It found that, for the countries in the sample,
a relatively larger proportion of the countries in
Category I of development experienced a high rate of
increase over a short period of time than of the coun-
tries in the other categories of economic development.
Also, it found that the average percentage increase in
investment as a percentage of product for the countries
in Category I was relatively higher than the averages

1961), p. 454; Everett E. Hagen, On the Theory of
Social Change: How Economic Growth Begins (Homewood,
Illinois: Dorsey Press, 1967), p. 518; and Simon
Kuznets, Economic Growth and Structure: Selected
Essays (New York: W. W. Norton & Company, 1965),
p. 232.

for the other categories, particularly Category II.

At this point, a limiting factor concerning these findings should be noted. The 46 countries examined in this chapter contain more than one third of the world's population; and, to the writer's knowledge, this is the largest sample of countries yet examined concerning this aspect of Professor Rostow's theory. Also, to the writer's knowledge, this is the first study of its type to use United Nations data extensively. Notwithstanding the fairly broad sample of countries examined in the present study, it should be realized that, for the purposes of the present study's examination, only a small fraction were in Professor Rostow's take-off stage.

The studies of Professor Kuznets, and others, although examining just a few countries, endeavored to examine each of these countries over long spans of time--attempting to include what data they found available for the take-off stage in their examinations of each of these countries. The current study examines only a brief span of data for each of its sample countries (which are ranked according to level of economic development) and is able to examine only the stages that these countries are in during the span of data examined.

While it cannot with certainty be determined

that the countries in Category I of the present study
are in Professor Rostow's take-off stage, the factors
discussed in Chapter V indicate a probability that
some of the Category I countries may fall in Professor
Rostow's take-off stage. Furthermore, the high pro-
portion of the Category I countries experiencing a
100 per cent or more increase, relative to the pro-
portions of countries in the other categories experi-
encing this increase, indicates that distinct changes
over a short span of time do occur as nations proceed
along the path of economic development--and that dis-
tinguishing characteristics, indeed, may exist for
the take-off stage. In addition, the high average
values for the Category I countries, as compared with
the average values for the other countries, support
this.

About half as high a proportion of the Cate-
gory V countries, as of the Category I countries,
experienced an increase of 100 per cent in investment
as a percentage of product. Also, the average increase
in investment as a percentage of product was about half
as high for the Category V countries as for the Cate-
gory I countries. In both these respects, the Category
II, III, and IV countries were much lower. Thus, this
indicates that a sort of "stagnation" of growth in
investment as a percentage of product occurs for those

countries "intermediate" in terms of level of economic
development. This interesting characteristic was not
hypothesized, or mentioned, by Professor Rostow.

In Chapter IV of the present study, Professor
Cairncross and Professor Checkland were cited as won-
dering if societies, once they have taken-off are
embarked upon a cumulative, automatic course.[10] To
the extent the present study has found that a signif-
icant slowdown occurs in the rate of increase in invest-
ment as a percentage of product for the countries
"intermediate" in terms of level of economic develop-
ment (see Table 7), it appears that stagnation or
falling back occurs, in some cases, unless this is
compensated for by an increasingly rapid application
of technology to the existing level of investment.

In summary, the present study found that dis-
tinct differences in the percentage changes of invest-
ment as a percentage of product over short spans of time
occur as nations move along the path of increasing
economic development. This is illustrated in Table 7,
which gives the average changes in investment as a
percentage of product over a 20 year period for each

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[10]A. K. Cairncross, "The Stages of Economic
Growth," Economic History Review, Second Series, Vol.
XIII, No. 3 (April, 1961), p. 453; and S. G. Checkland,
"Theories of Economic and Social Evolution: The Ros-
tow Challenge," Scottish Journal of Political Economy,
Vol. VII, No. 3 (November, 1960), p. 183.

category of development. In this respect, Category I

of the present study is differentiated from Category II

(the next highest category of development).

In addition, a larger proportion of the sample

countries in Category I than of the other categories

of development experienced the rapid increase in invest-

ment as a percentage of product which Professor Rostow

cites as a characteristic of the take-off stage. If

it could have been clearly determined by other criteria

that these countries were in his take-off stage this

would have lent a certain amount of support to his

theory. Unfortunately, due to Rostow's lack of rigor

and explicitness in defining the take-off stage it

was not possible to determine more than a limited

probability of this being the case--due mainly to the

position of these countries in relation to the others

Professor El-Kammash ranked ordinally according to

level of economic development.

A Second Aspect of Professor Rostow's
Theory Examined

Professor Rostow stated that during the drive-

to-maturity stage, "some 10-20% of the national income

is steadily invested. . . ."[11] The drive-to-maturity

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[11]Rostow, p. 9.

stage is the stage immediately following Professor

Rostow's take-off stage, which was examined in the

first part of the present chapter. Examined in the

first part of this chapter was Professor Rostow's

statement that investment increases from 5 per cent

to 10 per cent of national income during the brief

take-off stage. Thus, from these two statements, Pro-

fessor Rostow can be interpreted as saying that

investment becomes a larger percentage of national

income as nations become more developed.

This portion of the chapter examines the avail-

able evidence to see if the sample countries higher

along the path of economic development have higher

percentages of their products devoted to investment.

The hypothesis examined is that the percentages for

the countries high in the ranking are observably higher

than those for the countries at the lower end of the

ranking.

Calculations and Results

As a preliminary step, the mean value of the

data for each country in Table 3 was plotted in Fig-

ure 3. Where a country had two series of data, the

mean values were averaged and the single value was

plotted. Thus, 46 countries ranked according to level

of economic development were plotted along the horizontal

FIGURE 3

MEAN VALUES OF GROSS DOMESTIC FIXED CAPITAL
FORMATION AS A PERCENTAGE OF GROSS DOMESTIC
PRODUCT IN 46 COUNTRIES, 1950 - 1966
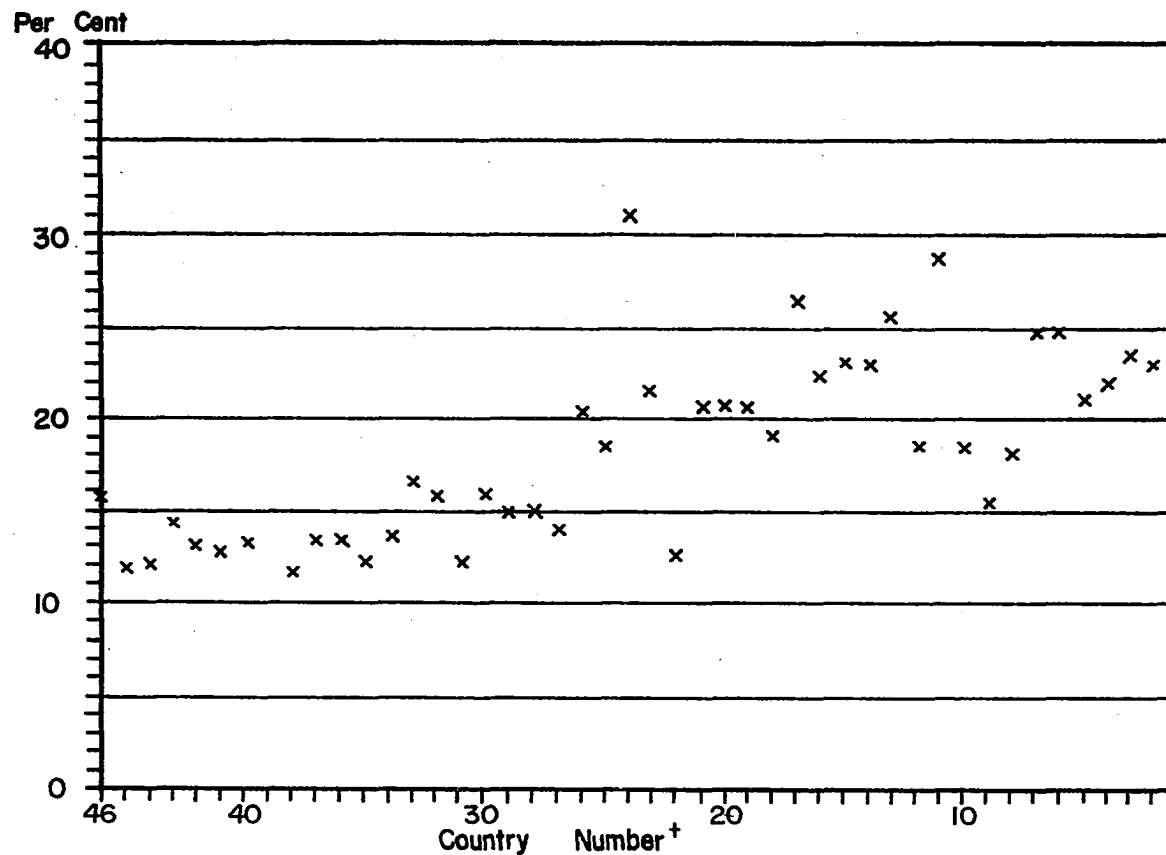
Source: Calculated   from   data   in   Table   3,   for   list   of   countries   see   Table   3.
+Larger   number   indicates   a   lower   level   of   economic   development.

axis of Figure 3. Country 46, on the left, represents
Mauritius (the country ranking lowest in terms of level
of economic development); and country 1, on the right,
represents the United States (the country ranking
highest). The vertical axis of Figure 3 represents
the mean value of "Gross Domestic Fixed Capital Forma-
tion as a Percentage of Gross Domestic Product" for
each country. In Figure 3, it may be observed that
this percentage generally becomes larger for more
highly developed countries. Some of the divergences
from this trend are likely to be due to the variations
in accounting practices from country to country.

An average value was calculated for each of the
five categories of development using the data plotted
in Figure 3. In other words, the data for the sample
countries were used, and a single average value was
used for each country having two series of data.
These average values by category of development are
contained in Table 8.

In Table 8, the average values calculated for
each category of development are positively related to
an increasing level of economic development. In
every case there are successively higher average
values for higher categories of economic development.
The average value for Category I is 12.7, the value
for Category II is 14.9, and the value for Category

TABLE 8

MEAN VALUE OF GROSS DOMESTIC FIXED CAPITAL FORMATION
AS A PERCENTAGE OF GROSS DOMESTIC PRODUCT,
AVERAGE FOR 46 COUNTRIES BY CATEGORY
OF DEVELOPMENT, 1950-1966

Category of Development	Mean Value
V	22.2
IV	20.1
III	19.9
II	14.9
I	12.7

Source: Calculated from data in Table 3.

III is 19.9. The average values for Categories IV

and V are 20.1 and 22.2, respectively. This informa-

tion has been plotted in Figure 4.

As a further step, the rank correlation was

computed for the data plotted in Figure 3 using the

formula $r = \dfrac{6\Sigma d^2}{n(n^2-1)}$. A value of 0.75 was obtained,

lending support to the notion that investment becomes

a larger percentage of national product as contries

become more developed.

The above results based on the 46 countries in

the sample indicate that, in moving from countries

which are lower to those which are higher in terms of

level of economic development, investment becomes an

increasingly large percentage of national product.

FIGURE 4

MEAN VALUE OF GROSS DOMESTIC FIXED
CAPITAL FORMATION AS A PERCENTAGE
OF GROSS DOMESTIC PRODUCT, AVERAGE
FOR 46 COUNTRIES BY CATEGORY OF
DEVELOPMENT, 1950 - 1966
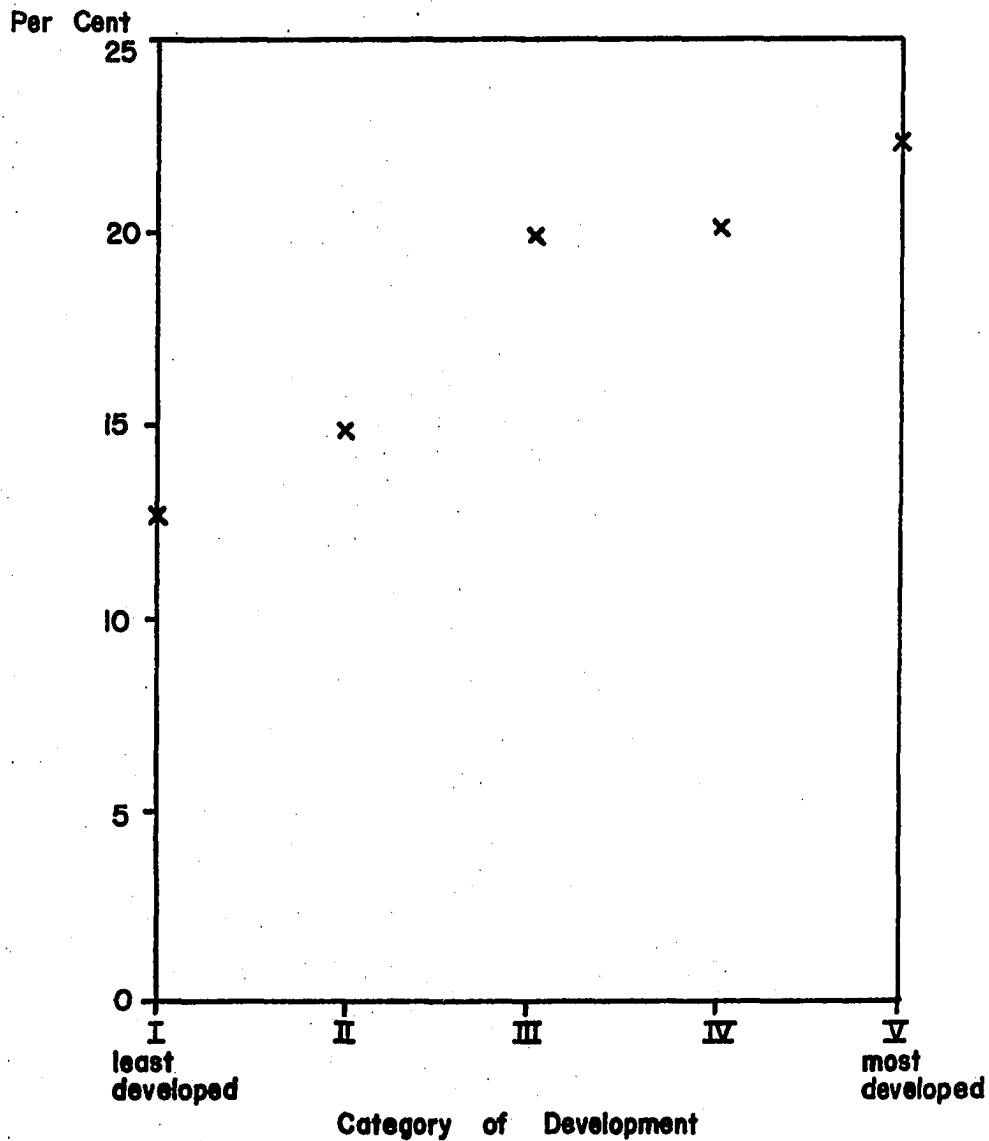
Source: Data from Table 8.

APPENDIX TO CHAPTER VI

APPENDIX TO CHAPTER VI

When, in the present study, an attempt was
made to fit linear regression lines to the data in
Table 3, a minor difficulty was encountered due to
the changeovers from older series of data to newer
ones; this occurred for 10 countries. Two cases typi-
cal of these 10 countries are illustrated in Figures
5 and 6 by means of graphing some of the percentage
data from Table 3. In Figure 5, Chile, the situation
is illustrated where a discontinuity is observable
between the "Series A" data and the "Series B" data.
In this case there is a vertical "jump" (a movement
upward on the Y-axis) from "Series A" to "Series B."
If a linear regression line were fitted to the per-
centage data for Chile without compensating for this
jump, the slope of the linear regression line would
be unduly exaggerated. Similarly, in a case of a
vertical "drop" from "Series A" to "Series B," and
no compensation were made, the slope of the fitted
linear regression line for a given country would be
understated.

FIGURE 5

GROSS DOMESTIC FIXED CAPITAL FORMATION IN
CHILE AS A PERCENTAGE OF GROSS DOMESTIC
PRODUCT, ANNUALLY, 1950 - 1966
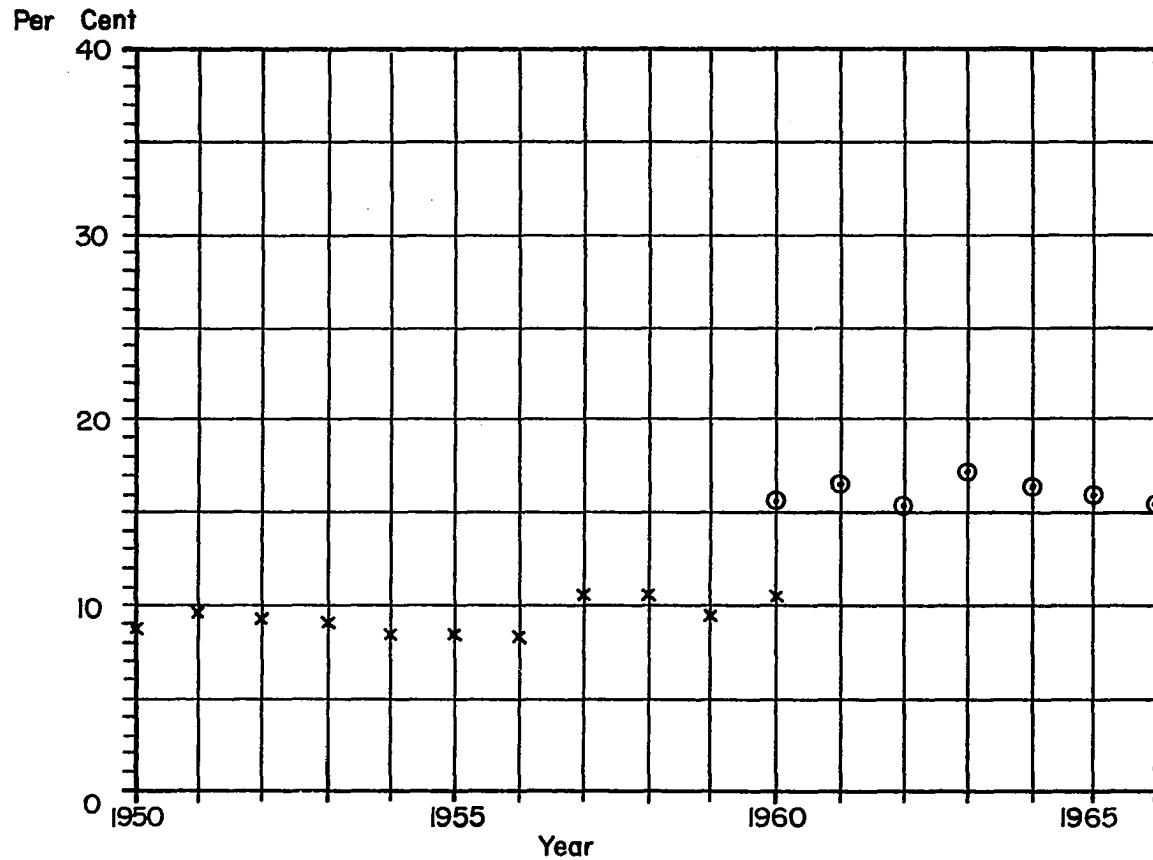
Source: Data from Table 3
⊙ Data from new series.

In Figure 6 a case is given where the series
of percentage data appears to be continuous, even
though there is a changeover from an older series to
a newer one. The data for West Germany in Figure 6
are typical of the data for several of the countries
which had a changeover from one series to another in
which the data appeared to be continuous.

For those 10 countries in Table 3 which had
two series of data, an attempt was made by this
researcher to adjust and consolidate the series before
reporting the results of various calculations in
Table 4. This was done so that what data were avail-
able would be utilized, and so that as many countries
as possible would be included in the sample examined
in the present study.

As a preliminary step, the same calculations
were conducted for each series of data for these 10
countries as had been conducted for the other coun-
tries. This consisted of finding:

1) the Y-intercept and the slope of the linear
   regression line fitted to each series of
   data;

2) the coefficient of correlation of each fit-
   ted linear regression line;

3) the mean, or average, value for each series
   of data;

FIGURE 6

GROSS DOMESTIC FIXED CAPITAL FORMATION IN
WEST GERMANY AS A PERCENTAGE OF GROSS
DOMESTIC PRODUCT, ANNUALLY, 1950 - 1966
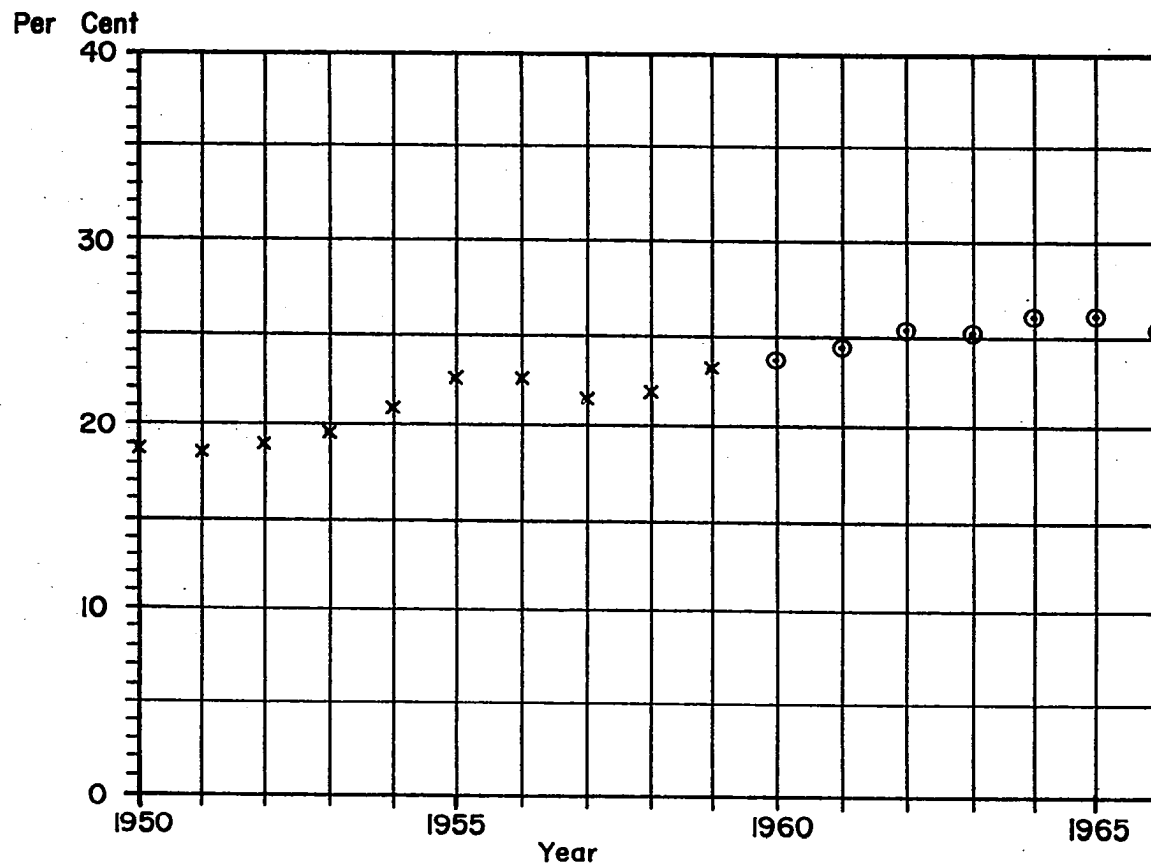
Source: Data from Table 3.
⊙ Data from new series.

4) the standard error for each series of data;

5) based on the fitted linear regression lines, the percentage change in "Gross Domestic Fixed Capital Formation as a Percentage of Gross Domestic Product" for each series of data over a time period totaling 20 years.

Taken individually, a range of often less than 10 years of data was available for each of these series; although, when considered together, a range of usually 14 to 17 years was available for a particular country.

The author plotted the "Series A" and "Series B" data for these countries on a graph, along with the regression lines which had been fitted to the "Series A" and "Series B" data. The results of the plotted data and regression lines for both of a country's series were considered by the author in estimating whether an increase of 100 per cent over a 20 year period appeared reasonable. The results of this process of estimation were reported in the final column of Table 4 only as increase "Under 100" per cent or increase "Over 100" per cent. More specific estimates of the magnitudes of these changes for the countries having two series of data were not attempted. In Table 4 the countries having these estimates are indicated by the use of an asterisk (*).

CHAPTER VII

GOVERNMENT CONSUMPTION EXPENDITURE AS A PERCENTAGE

OF EXPENDITURE ON GROSS DOMESTIC PRODUCT,

SELECTED COUNTRIES

Introduction

In this chapter, Professor Rostow's state-

ment concerning the rapid expansion of the govern-

mental sector in a nation's economy during the take-

off stage is examined. According to Professor Rostow,

one of the necessary conditions for the take-off stage

to occur is:

> *) the existence or quick emergence of a pol-
> itical, social and institutional framework
> which exploits the impulse to expansion in
> the modern sector and the potential external
> economy effects of the take-off and gives
> to growth an on-going character.[1]

In this statement Professor Rostow is not as

specific as he is in the take-off stage requirement

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[1]W. W. Rostow, The Stages of Economic Growth:
A Non-Communist Manifesto (Cambridge: Cambridge Uni-
versity Press, 1960), p. 39.

examined in the previous chapter:

> *) a rise in the rate of productive investment
> from, say, 5% or less to over 10% of
> national income (or net national product
> (NNP)).[2]

It follows from the second statement that a
doubling of investment as a percentage of product is
necessary in order for the take-off stage to occur in
a given country; while it follows from the first state-
ment that in some cases the requisite governmental
structure may already be in existence, and in other
cases there is a rapid expansion of the governmental
sector, the magnitude of which Professor Rostow does
not specify other than by the words "quick emergence."

The method used here to examine the increase
in government as a percentage of product is similar
to that used in the previous chapter to examine the
increase in investment as a percentage of product.
Professor Rostow's statement examined in the previous
chapter required that a 100 per cent increase of
investment as a percentage of product during the take-
off period be used as the criterion in seeing whether
the available data support this statement. Although
Professor Rostow did not specify the magnitude of the
increase in the proportionate size of the governmental

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[2] Ibid.

sector, increases of 50 and 100 per cent have been
arbitrarily chosen for the present study as a means
of examining this statement.

Certain limitations concerning the data
examined in the present chapter exist which were not
encountered in the previous chapter. In spite of the
earnest efforts of the United Nations to make data
for "government consumption expenditure" comparable
for different countries, more problems are encountered
with the data for this concept than was the case with
the data for "gross domestic fixed capital formation."
These limitations and their implications concerning
the validity of the study being performed in the
present chapter are discussed in the following section.

Limitations of the Data

The United Nations <u>Yearbook of National Accounts</u>
<u>Statistics</u> defines "general government consumption
expenditure" as follows:

> Compensation of employees and purchases by general
> government from enterprises and from the rest of
> the world <u>less</u> sales of goods and services (other
> than surplus stores which are treated as a decrease
> in government stocks) to enterprises and households.

> The general government sector covers all cen-
> tral, state or local government agencies other
> than those defined as public enterprises, irre-
> spective of the treatment of those agencies in
> the government accounts of the particular country.
> Social security schemes are included.

Expenditure jointly financed by households and
general government is allocated to the sector
which actually makes the purchase and the contri-
bution of the other sector is treated as a trans-
fer. However, where households pay only a nominal
amount the general government sector is considered
as the purchaser and the charge to households
recorded as a transfer to general government.

Expenditure of a capital nature for national
defence (excluding civil defence) is treated as
consumption expenditure while all expenditure on
capital formation for civil purposes . . . is
included in gross domestic fixed capital formation.

Transfers in kind made by general government
to the rest of the world, other than transfers of
military equipment, are excluded here and included
in exports while similar transfers received from
abroad by general government are included in both
general government consumption expenditure and
imports. Transfers of military equipment between
governments are treated simply as consumption
expenditure of the donor government and are not
recorded in the accounts of the receiving country.[3]

The data for government expenditure examined

in this chapter are subject to certain problems not

encountered with the data for capital formation in the

last chapter. These problems result from the fact

that the United Nations data on government expenditure

for some of the sample countries examined in this

study are not broken down into components--this is

especially true of the data for those countries which

are least developed.

The primary problem is that in those cases

_____

[3]United Nations, <u>Yearbook of National Accounts
Statistics, 1966</u> (New York: Statistical Office of the
United Nations, 1967), pp. xvi-xvii.

where the data for government expenditure are not broken down it is not possible to know what is happening to the amount of money being spent in the area of military expenditures. The proportionate size of government military expenditures vary from country to country due to involvement, or threat of involvement, in war activities. If military expenditures make up a large proportion--say as much as 20 per cent--of a country's government sector, a military build-up can have an important impact upon the growth of spending in the government sector. Therefore, changes in military spending in these cases can have a significant impact upon changes in the relative size of the government sector in a nation's economy.

A secondary problem is that it is not possible to know what is happening to the amount of money being spent by each of the sample countries for social security and other government transfer payments if the data for government expenditure are not broken down. This is not a serious problem, because an increase in the size of a country's social security system, or system of transfer payments, may be roughly considered as going along with Professor Rostow's statement concerning an increase in the size of a nation's government structure. Professor Rostow's statement being examined in this chapter deals with the ". . . quick

emergence of a <u>political</u>, <u>social</u> <u>and</u> <u>institutional</u> <u>framework</u> [underlining mine]."[4] Thus the emergence of a social security system, or system of transfer payments, by the government does not necessarily seem to fall outside of this statement.

Although data on military expenditures are not available for some of the countries in the sample examined in the present study, these data are available for more than half of the countries examined. Table 15 in the Appendix of this chapter contains a list of the countries examined. In the last column of this table is information indicating whether the data on Government Consumption Expenditure is broken down into sectors for these countries (i.e., as a minimum into "Military" and "Civil" sectors). For 25 of these 47 countries, breakdowns of government expenditure data are available. In some of these cases, where the data were available, the military sector made up a large proportion of the government sector (i.e., as much as 60 to 80 percent); but in all of these 25 cases except one, Portugal, the trend of increase in the military sector was roughly the same as, or less than, that for the government sector over the years examined. In the case of Portugal the

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[4]Rostow, p. 39.

the trend of increase in military expenditure was
roughly similar to, or did not greatly exceed, that
for the respective government sector.

As for the secondary problem, the evidence
available for those countries having increases of 50
per cent or more in government as a percentage of
product indicates that excessive increases in social
security or transfer payments are not major causes of
these increases in the government sector.

In summary, the analysis conducted in the
present chapter is not as straightforward as that con-
tained in the previous chapter. Nonetheless, in spite
of the limitations on the data being examined in this
chapter, an analysis was attempted with the view that
it might provide some insights concerning this aspect
of Professor Rostow's take-off stage.

Methodology

In the present chapter, "Governmant Consump-
tion Expenditure as a Percentage of Expenditure on
Gross Domestic Product" was calculated for as many
of the 49 countries Professor El-Kammash ranked
according to level of economic development, and for
as many individual years for these countries, as had
satisfactory United Nations data. As was the case in

Chapter VI, these data were obtained from various
issues of the United Nations <u>Yearbook of National
Accounts Statistics</u> issued since World War II. In
the case of each country examined, data from a number
of these yearbooks were used so that the most recent
data available would be obtained. In most cases,
issues of the <u>Yearbook of National Accounts Statistics</u>
for 1957, 1958, 1959, 1961, 1962, 1966, and 1967 were
used, because no one of these provided the complete
range of data needed. Also, in most cases, the data
for a given country and year were available in several
of the issues, but the data from the most recent
<u>Yearbook</u> in which the data could be found were always
used.

Because of inadequate data, two countries were
omitted from those contained in Professor El-Kammash's
ranking. Both countries, Egypt and India, were elimi-
nated from Category I of development, leaving 47
countries of the original 49 in the ranking. Based
on United Nations population estimates for 1967, these
47 countries contain somewhat more than one third of
the world's population.[5]

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[5]Calculated using data from, United Nations,
<u>Demographic Yearbook, 1967</u> (New York: Statistical
Office of the United Nations, 1968).

After these percentages were calculated, a
linear regression line was fitted to the percentages
for each country and then projected the number of addi-
tional years necessary to total a 20 year period. The
percentage change in government as a percentage of
product over the 20 year period for each of these
countries was then calculated using these linear
regression lines. As in Chapter VI, gross data were
used rather than net data because of greater reliabil-
ity and availability.

Calculations

Enough data were available for many of the
countries selected for examination to permit the cal-
culation of percentages covering a 17 year span of
time. For the remaining countries, data for lesser
spans of time were available, but generally enough
data were available to permit the calculation of per-
centages covering useful lengths of time. Just as
"Gross Domestic Fixed Capital Formation as a Percentage
of Expenditure on Gross Domestic Product" was calcu-
lated from the various countries and years indicated
in Table 3 of Chapter VI, "Government Consumption
Expenditure as a Percentage of Expenditure on Gross
Domestic Product" was calculated for the various coun-
tries and years indicated in Table 9 of this chapter.

TABLE 9

GOVERNMENT CONSUMPTION EXPENDITURE AS A PERCENTAGE OF EXPENDITURE ON
GROSS DOMESTIC PRODUCT, SELECTED COUNTRIES, 1950-1966

Country Number	Series of Data	Country	Category of Development	Government Consumption Expenditure as a Percentage of Expenditure on Gross Domestic Product																
				1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
1	A	United States	V	12.3	16.4	20.2	19.9	18.8	17.0	17.2	18.0	18.7	18.0	17.9	18.8	18.9	18.8	18.6	18.2	19.2
2	A	Canada	V	9.7	12.2	14.5	14.9	14.8	14.3	13.9	13.7	14.3	13.9	14.3	15.0	14.5	14.2	14.2	13.8	14.3
3	A	Switzerland	V	--	--	--	11.8	12.3	10.5	10.7	11.2	12.0	11.1	10.2	10.9	11.3	11.7	11.6	11.6	12.0
4	A	New Zealand	V	11.1	13.0	12.7	13.4	10.9	12.6	13.2	13.0	13.1	13.2	13.0	13.2	13.3	12.8	12.9	13.5	14.0
5	A	Sweden	V	13.9	14.1	15.6	16.9	16.7	16.9	16.9	17.6	17.9	18.0	17.6	17.4	18.4	19.0	18.9	19.5	21.0
6	A	Australia	V	8.2	10.6	11.1	9.6	9.5	9.8	9.4	9.6	9.7	9.4	9.6	10.2	10.0	9.9	10.3	11.4	11.8
7	A	Luxembourg	V	13.0	11.8	12.1	13.9	13.6	12.7	11.0	11.0	12.6	11.4	10.3	--	--	--	--	--	--
7	B	Luxembourg	V	--	--	--	--	--	--	--	--	--	--	10.1	10.0	11.2	12.6	11.1	--	--
8	A	Belgium	V	10.0	10.5	12.3	12.6	12.3	11.4	11.3	11.2	12.1	12.6	12.6	12.1	12.4	13.2	12.6	13.0	13.4
9	A	United Kingdom	V	16.3	17.5	19.1	18.1	18.1	16.7	17.0	16.6	16.3	16.5	16.5	16.7	17.1	17.0	16.6	16.8	17.3
10	A	Denmark	V	10.2	11.3	12.0	12.2	12.9	12.9	12.9	12.9	13.1	12.8	12.7	13.7	14.4	14.6	14.7	15.5	16.0
11	A	Norway	V	--	10.2	11.7	13.7	12.9	12.7	12.5	13.0	13.8	14.2	14.0	14.1	15.1	15.4	15.5	16.2	16.6
12	A	France	V	13.9	14.2	15.6	15.2	13.8	12.4	13.9	14.1	13.3	13.9	13.3	13.4	13.5	13.5	13.5	13.4	13.3
13	A	Finalnd	V	11.8	10.2	11.5	12.2	11.6	11.5	12.3	12.5	12.8	13.2	12.6	12.5	13.4	14.2	14.2	14.6	15.1
14	A	West Germany	V	15.3	15.4	15.9	14.4	14.6	13.2	12.7	12.6	13.2	13.4	13.5	--	--	--	--	--	--
14	B	West Germany	V	--	--	--	--	--	--	--	--	--	--	13.6	14.1	15.0	15.7	14.9	15.4	15.8
15	A	Netherlands	V	13.6	13.3	14.0	14.1	14.6	14.6	15.1	15.1	14.6	13.7	13.7	14.2	14.8	15.7	15.8	15.7	16.1
16	A	Austria	V	11.9	13.1	13.4	13.7	13.7	12.4	12.7	13.6	13.7	13.7	12.9	12.7	12.7	13.2	13.5	13.6	13.9
17	A	Japan	V	11.1	9.1	11.1	10.8	11.1	10.5	9.7	9.0	9.9	9.2	8.6	8.3	8.7	9.4	9.3	9.6	9.6
18	A	Argentina	IV	--	12.0	13.3	10.0	14.4	10.1	9.9	8.6	9.8	8.6	9.0	10.2	11.1	10.2	10.3	10.4	11.4
19	A	Puerto Rico	IV	12.7	12.6	12.8	12.9	13.1	12.9	14.6	14.2	13.8	12.8	13.4	13.2	13.6	14.1	14.1	13.6	14.2
20	A	Italy	IV	9.9	10.4	12.1	11.9	13.6	12.1	12.2	12.1	12.4	12.5	12.5	12.3	12.8	13.6	14.0	14.7	14.6
21	A	Venezuela	III	--	--	10.6	13.0	13.0	12.5	11.2	10.7	14.5	12.2	--	--	--	--	--	--	--
21	B	Venezuela	III	--	--	--	--	--	--	--	--	--	--	13.8	13.7	13.1	13.8	12.1	12.7	13.4
22	A	Chile	III	11.3	11.1	9.4	10.2	9.9	10.3	9.7	9.6	10.4	10.2	10.3	--	--	--	--	--	--
22	B	Chile	III	--	--	--	--	--	--	--	--	--	--	10.7	10.8	10.8	10.0	9.9	11.1	11.6
23	A	Union of South Africa	III	--	--	11.7	9.9	10.2	9.4	9.6	9.6	10.0	10.1	10.1	10.4	11.3	11.3	11.5	11.8	12.0
24	A	*Yugoslavia	III	--	--	22.7	18.9	18.2	15.3	15.0	13.0	13.9	13.0	13.2	13.6	13.3	11.8	10.4	9.1	8.5
25	A	Costa Rica	III	7.1	7.5	7.9	7.7	8.4	9.7	10.6	10.2	10.5	11.3	11.7	12.3	12.0	13.2	13.5	--	--
26	A	Peru	III	--	--	7.8	8.7	8.8	7.6	9.1	8.7	8.7	8.9	8.4	9.3	9.2	9.6	10.2	10.0	--
27	A	Bolivia	III	--	--	--	--	--	--	--	--	9.2	9.4	8.6	9.2	9.2	9.6	9.5	10.9	10.4
28	A	Spain	III	--	--	--	--	--	8.8	9.0	9.5	8.1	9.0	8.9	7.5	8.2	8.2	7.8	--	--
29	A	Brazil	II	10.8	11.0	11.3	15.1	11.5	13.5	14.7	14.4	13.7	13.8	15.3	15.5	15.5	16.3	15.4	13.7	13.8
30	A	Mexico	II	--	--	--	4.4	(4.4)	4.3	4.4	4.5	4.6	4.5	5.1	5.2	5.3	5.7	5.5	5.6	5.8
31	A	Portugal	II	--	--	9.9	9.6	12.1	10.3	9.8	9.7	9.7	10.9	10.6	12.7	13.0	12.5	12.5	12.3	12.3
32	A	Ecuador	II	13.8	13.5	12.7	13.4	12.8	12.4	12.1	11.7	11.4	11.8	--	--	--	--	--	--	--
32	B	Ecuador	II	--	--	--	--	--	--	--	--	--	--	12.8	13.7	13.4	12.8	13.3	13.6	--
33	A	Thailand	II	--	--	--	11.3	11.6	11.6	11.3	--	--	--	--	--	--	--	--	--	--
33	B	Thailand	II	--	--	--	--	--	--	--	9.2	9.3	8.6	10.0	9.0	9.1	8.7	9.0	9.2	9.2
34	A	Burma	II	10.2	8.6	9.7	9.5	15.2	11.0	11.7	12.1	13.6	13.5	13.9	13.1	13.4	13.3	15.6	--	--
35	A	Morocco	II	--	6.5	6.8	7.6	8.1	10.7	11.5	12.7	12.6	12.8	13.4	14.5	13.7	14.4	14.9	13.7	--
36	A	Malaysia	I	6.9	7.5	11.0	13.3	(13.2)	13.0	13.9	14.4	15.7	14.0	13.0	14.3	14.6	15.7	17.0	17.1	--
37	A	Colombia	I	10.2	11.1	11.2	6.7	6.7	7.1	6.5	5.7	5.8	5.8	6.3	6.7	7.0	7.4	6.6	6.7	--
38	A	Turkey	I	14.3	12.4	11.4	14.5	11.6	14.6	13.3	12.0	11.6	12.4	12.7	14.1	14.7	14.3	14.3	14.2	13.1
39	A	Guatemala	I	11.3	9.9	12.8	6.6	11.9	6.1	6.3	6.8	7.3	7.9	7.8	8.0	7.1	6.9	6.7	7.8	7.5
40	A	Philippines	I	7.2	7.3	7.9	7.8	7.9	8.1	8.4	8.4	8.5	8.6	8.8	9.0	9.5	9.8	10.0	10.0	--
41	A	Honduras	I	5.9	6.3	6.6	6.5	8.4	7.6	9.9	9.2	9.9	9.4	9.7	9.8	9.0	9.2	9.9	9.7	9.9
42	A	Ceylon	I	10.7	10.4	12.6	13.1	12.0	11.2	12.4	--	--	--	--	--	--	--	--	--	--
42	B	Ceylon	I	--	--	--	--	--	--	--	--	14.6	14.2	14.3	14.6	14.2	13.9	14.3	14.5	13.9
43	A	El Salvador	I	--	--	--	--	--	--	--	--	10.2	10.3	10.1	10.3	10.0	9.4	8.7	8.7	8.7
44	A	Pakistan	I	--	--	--	--	--	--	--	--	--	8.6	8.2	8.4	8.9	10.3	10.1	12.7	--
45	A	South Korea	I	--	--	--	7.9	11.8	8.8	9.5	10.9	12.7	14.1	14.5	13.6	14.4	11.3	9.0	9.5	10.3
46	A	Nigeria	I	--	3.3	3.8	4.0	3.6	4.9	4.9	5.1	--	--	--	--	--	--	--	--	--
46	B	Nigeria	I	--	--	--	--	--	--	--	--	6.5	7.6	8.4	8.1	7.4	--	--	--	--
47	A	Mauritius	I	9.5	10.3	11.4	10.3	10.5	10.1	9.9	10.6	12.5	12.4	15.3	12.5	13.0	10.7	13.7	15.4	16.9

( ) Designates data calculated by averaging the data for the year immediately preceding and the year immedi-
ately following, a year for which no data were available.

-- Reliable data not available (For this series of data)

* The percentages for Yugoslavia were calculated using "Expenditure on Gross Material Product," a somewhat
similar, but not strictly comparable concept to "Expenditure on Gross Domestic Product."

Source: Calculated from data found in the United Nations, Yearbook of National Accounts Statistics,
1957, 1958, 1959, 1961, 1962, 1966, and 1967.

In Table 9, 47 countries are ordered according to level of economic development. For a number of these countries there was a changeover from an older series of data to a newer series of data and, for this study, these were labeled "Series A" and "Series B," respectively. Thus, there are 55 entries under the column labeled "Country" in Table 9 because of the "Series A" and "Series B" designations of the data. Also, as in Table 3 of Chapter VI, Table 9 of this chapter contains "Category of Development" designations for various countries falling into Professor El-Kammash's categories of economic development.

For the countries listed in Table 9, the ranges of available data for "Government Consumption Expenditure as a Percentage of Expenditure on Gross Domestic Product" in most cases experience an increase from the first year to the final year. For example, in the case of the United States, the Table 9 percentage for the year 1950 is 12.3, and the percentage for the year 1966 is 19.2--a sizable increase. In contrast, in the case of Switzerland, the Table 9 percentage for the year 1953 is 11.8, while the percentage for the year 1966 is 12.0--a rather small increase. These two cases serve to illustrate that, in Table 9, the change from the first year to the final year varies considerably in magnitude from one country to another.

In this study, the changes between these first and final years could have been examined; but, as in Chapter VI, a method which provides more comprehensive information concerning the changes involved is to fit a linear regression line to the data for each country, so as to derive the benefits of using the trend over the whole series of years rather than the mere change between the first and final years. In addition, by using this procedure, changes in these fitted linear regression lines, of the form $Y = a + bX$, can easily be examined over a similar period of time, thus making the changes comparable.

The data in Table 9 for "Government Consumption Expenditure as a Percentage of Expenditure on Gross Domestic Product" are the basis for the empirical examination of Professor Rostow's theory conducted in this chapter. Using the data in Table 9, a linear regression line was fitted to the available span of percentages for each country to see if the fitted linear regression line, when examined for a time period totaling 20 years in length, would amount to 50 and 100 percent increases in "Government Consumption Expenditure as a Percentage of Expenditure on Gross Domestic Product."

In a typical case, a linear regression line was fitted to a 17 year span of data, and projected

an additional three years to see what percentage
change could be expected over a 20 year period. A
17 year span of data was not available in all cases
(e.g., 14-16 year spans of data were common), but in
every case a linear regression line was fitted to the
available data for each country and then projected the
number of additional years necessary to have a period
totaling 20 years. Also, in calculating the linear
regression lines for each country the first year of
available data was considered to be "year 1," regard-
less of the actual year in which the data were first
available.

In attempting to fit the linear regression
lines to the data in Table 9, a minor problem was
encountered in the form of changeovers from an older
series to a newer one. This occurred for 7 countries--
as indicated by the "Series A" and "Series B" designa-
tions in Table 9. The study conducted in this chapter
dealt with this problem in the same manner as in the
previous chapter. A discussion of how this problem was
handled is contained in the Appendix of Chapter VI.

The problem of data unavailability for a given
year within a series was resolved for two countries in
Table 9 by averaging the data of the year preceding
and following the year for which the data could not
be found. This was deemed a reasonable method to use

since there were no sharp fluctuations in the data for
these countries. This process of averaging to arrive
at the missing data is indicated in Table 9 by the
use of parentheses around the 1954 percentage data for
Mexico and Malaysia.

Using the data in Table 9, the following
information was calculated:

1) the Y-intercept and the slope (a and b
   respectively of the linear equation Y =
   a + bX) of the linear regression line fit-
   ted to each series of data;

2) the coefficient of correlation of each
   fitted linear regression line;

3) the mean, or average, value for each ser-
   ies of data;

4) the standard error for each series of data;

5) based on the fitted linear regression lines,
   the percentage change in "Government Con-
   sumption Expenditure as a Percentage of
   Expenditure on Gross Domestic Product" for
   each series of data over a time period
   totaling 20 years.

Much of this information has been included in Table 10,
and most of the rest is included in later tables.

TABLE 10

REGRESSION VALUES AND RELATIVE CHANGES IN GOVERNMENT CONSUMPTION EXPENDITURE AS A PERCENTAGE OF GROSS DOMESTIC PRODUCT OVER 20 YEAR PERIOD

Country Number	Country	Category of Develop-ment	Mean Value of Data	Fitted Linear Regression Line			Percentage Change in Ratio over 20 Year Period
				Y-intercept	Slope	Standard Error	
1	United States	V	18.1	16.7	0.147	1.560	17.5
2	Canada	V	13.9	12.9	0.109	1.092	16.9
3	Switzerland	V	11.3	11.2	0.018	0.591	3.2
4	New Zealand	V	12.9	12.1	0.088	0.618	14.6
5	Sweden	V	17.4	14.5	0.331	0.633	45.8
6	Australia	V	10.0	9.2	0.085	0.720	18.3
7	Luxembourg*	V	--	--	--	--	Under 50
8	Belgium	V	12.1	10.9	0.137	0.599	25.3
9	United Kingdom	V	17.1	17.6	-0.055	0.681	-6.3
10	Denmark	V	13.2	10.8	0.274	0.495	51.0
11	Norway	V	13.8	11.0	0.331	0.586	60.0
12	France	V	13.8	14.5	-0.076	0.614	-10.5
13	Finland	V	12.7	10.6	0.233	0.497	43.8
14	West Germany*	V	--	--	--	--	Under 50
15	Netherlands	V	14.6	13.5	0.125	0.560	18.5
16	Austria	V	13.2	12.9	0.037	0.518	5.7
17	Japan	V	9.7	10.7	-0.109	0.705	-20.4

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TABLE 10 (Cont.)

Country Number	Country	Category of Development	Mean Value of Data	Fitted Linear Regression Line			Percentage Change in Ratio over 20 Year Period
				Y-intercept	Slope	Standard Error	
18	Argentina	IV	10.6	11.5	-0.107	1.446	-18.6
19	Puerto Rico	IV	13.4	12.7	0.078	0.478	12.3
20	Italy	IV	12.6	10.7	0.211	0.684	39.5
21	Venezuela*	III	--	--	--	--	Under 50
22	Chile*	III	--	--	--	--	Under 50
23	Union of South Africa	III	10.6	9.6	0.123	0.691	25.6
24	Yugoslavia	III	14.0	20.2	-0.771	1.392	-76.5
25	Costa Rica	III	10.2	6.5	0.467	0.362	143.8
26	Peru	III	8.9	7.9	0.140	0.420	35.6
27	Bolivia	III	9.6	8.6	0.192	0.427	44.6
28	Spain	III	8.5	9.3	-0.139	0.445	-30.1
29	Brazil	II	13.8	11.7	0.236	1.225	40.2
30	Mexico	II	4.9	4.0	0.127	0.172	63.4
31	Portugal	II	11.2	9.5	0.215	0.860	45.5
32	Ecuador*	II	--	--	--	--	Under 50
33	Thailand*	II	--	--	--	--	Under 50
34	Burma	II	12.3	9.4	0.364	1.305	77.6
35	Morocco	II	11.6	6.7	0.610	1.062	181.5

TABLE 10 (Cont.)

Country Number	Country	Category of Develop- ment	Mean Value of Data	Fitted Linear Regression Line			Percentage Change in Ratio over 20 Year Period
				Y-intercept	Slope	Standard Error	
36	Malaysia	I	13.4	9.0	0.514	1.471	113.5
37	Colombia	I	7.3	9.3	-0.230	1.389	-49.4
38	Turkey	I	13.3	12.6	0.072	1.098	11.5
39	Guatemala	I	8.2	10.1	-0.220	1.664	-43.3
40	Philippines	I	8.6	7.0	0.184	0.167	52.5
41	Honduras	I	8.6	6.5	0.240	0.791	74.0
42	Ceylon*	I	--	--	--	--	Under 50
43	El Salvador	I	9.6	10.8	-0.242	0.282	-44.7
44	Pakistan	I	9.6	7.0	0.643	0.724	182.9
45	South Korea	I	11.3	10.6	0.090	2.140	16.9
46	Nigeria*	I	--	--	--	--	Over 100
47	Mauritius	I	12.1	9.0	0.344	1.303	76.9

Source: Calculated from data in Table 9.

*Two series of data were available for this country. These series were consolidated in the manner discussed in the Appendix to Chapter VI.

In the first column of Table 10 are numbers
indicating the ordinal relationship of the sample coun-
tries--with larger numbers signifying lower levels of
economic development. In the same manner, the third
column contains Professor El-Kammash's Category of
Development designations for countries of approximately
similar levels of economic development. The fourth
column contains the mean values for the available data
in each series. The fifth, sixth, and seventh columns
contain the Y-intercept, slope, and standard error,
respectively, of the linear regression lines fitted
to the series of data in Table 9. As was the case in
Table 4 of the previous chapter, this information has
not been provided in Table 10 for those countries
having two series of data because of the procedure of
estimation used in combining the two series.

One may observe in Table 10 that the standard
errors of the fitted linear regression lines are rela-
tively small in most of the cases. From this it may
be inferred that these regression lines are reasonably
good approximations of the data.

Results

The data contained in the final column of
Table 10 are those which are most relevant to Professor
Rostow's statement concerning the take-off stage. In

this column one is able to observe which of the coun-
tries in the sample experienced a large increase over
the 20 year period. If Professor Rostow's statement
concerning the take-off stage is correct, a "cluster"
of countries somewhere near the bottom of the ranking
in Table 10 should have experienced large increases--
say, in the magnitude of 50 to 100 per cent in govern-
ment as a percentage of product based on the fitted
linear regression lines. Although an increase of 100
per cent was used to examine the statement in the last
chapter, an increase in the magnitude of 50 to 100
per cent will be used to examine the statement in
the present chapter. This is because the statement
in the present chapter allows for the previous exis-
tence, as well as the rapid expansion, of the govern-
ment sector as a major part of a nation's national
product.

In Table 10, none of the 17 countries in Cate-
gory V of development and none of the three countries
in Category IV of development had as much as a 100
per cent increase. One of the eight countries in Cate-
gory III of development, Costa Rica, experienced a
100 per cent increase; and one of the seven countries
in Category II of development, Morocco, experienced
a 100 per cent increase. Category I of development
contained the largest number of countries having an

increase of 100 per cent or more. Three of the Category I countries--Malaysia, Pakistan, and Nigeria-- had a 100 per cent or more increase.

Table 11 contains the countries from Table 10 which had an increase of 100 per cent or more. In the next to the last column of Table 11 it can be seen that the coefficients of correlation for the linear regression lines fitted to the data for these countries are generally high. Coefficient of correlation information has not been provided for Nigeria because it had two series of data.[6]

As in Chapter VI, coefficient of correlation information has only been provided for those countries in the present chapter having relatively high increases (above 50 per cent), because the formula for calculating the coefficient of correlation yields unusable results when the fitted linear regression lines are horizontal, or nearly so.

In the final column of Table 11 are listed the number of observations upon which the calculations

---

[6]Information dealing with how the calculations for Nigeria were conducted is contained in the Appendix to Chapter VI.

TABLE 11

COUNTRIES IN THE SAMPLE HAVING A 100 PER CENT INCREASE IN "GOVERNMENT
CONSUMPTION EXPENDITURE AS A PERCENTAGE OF EXPENDITURE ON
GROSS DOMESTIC PRODUCT" OVER 20 YEAR PERIOD

Country Number	Country	Category of Development	Percentage Change over 20 Year Period	Coefficient of Correlation of Fitted Line	Total Number of Years for Which Data Were Available
25	Costa Rica	III	143.8	0.984	15
35	Morocco	II	181.5	0.928	15
36	Malaysia	I	113.5	0.849	15
44	Pakistan*	I	182.9	0.871	7
46	Nigeria**	I	Over 100	--	12

Source: Calculated from data in Table 9.

*The information for Pakistan was calculated using only a seven year span
of data.

**A discussion of how the estimate for Nigeria was determined is contained
in the Appendix to Chapter VI.

arriving at a percentage change over a 20 year period
are based. The results for Pakistan have only been
included in Table 11 as a matter of interest, because
they are based on calculations using only a seven
year span of data.

Looking at the final column of Table 10, two
of the 17 countries in Category V of development had
a 50 per cent or more increase. These are Denmark and
Norway. None of the three countries in Category IV of
development had an increase of as much as 50 per cent;
while one of the eight countries in Category III of
development, Costa Rica, had an increase of over 100
per cent. Three of the seven countries in Category
II of development--Mexico, Burma, and Morocco--
experienced increases of 50 per cent or more. Cate-
gory I of development contained the largest number
of countries having increases of 50 per cent or more.
Six of its 12 countries had an increase of at least
50 per cent. These are Malaysia, Philippines, Hon-
duras, Pakistan, Nigeria, and Mauritius.

Table 12 contains the countries from Table 10
that had increases of 50 per cent or more. In the
next to the last column of Table 12 it can be seen
that the coefficients of correlation for the linear
regression lines fitted to the data for these countries
are generally high. As in Table 11, coefficient of

TABLE 12

COUNTRIES IN THE SAMPLE HAVING A 50 PER CENT OR MORE INCREASE IN
"GOVERNMENT CONSUMPTION EXPENDITURE AS A PERCENTAGE OF
GROSS DOMESTIC PRODUCT" OVER 20 YEAR PERIOD

Country Number	Country	Category of Development	Per Cent Change over 20 Year Period	Coefficient of Correlation of Fitted Line	Total Number of Years for Which Data Were Available
10	Denmark	V	51.0	0.938	17
11	Norway	V	60.0	0.933	16
25	Costa Rica	III	143.8	0.984	15
30	Mexico	II	63.4	0.948	13
34	Burma	II	77.6	0.769	15
35	Morocco	II	181.5	0.928	15
36	Malaysia	I	113.5	0.849	15
40	Philippines	I	52.5	0.981	16
41	Honduras	I	74.0	0.829	17
44	Pakistan*	I	182.9	0.871	7
46	Nigeria**	I	Over 100	--	12
47	Mauritius	I	76.9	0.791	17

Source: Calculated from data in Table 9.

*The information for Pakistan was calculated using only a seven year span of data.

**A discussion of how the estimate for Nigeria was determined is contained in the Appendix to Chapter VI.

correlation information has not been provided for

Nigeria because it had two series of data.[7]

In the final column of Table 12 are listed

the number of observations upon which the calculations

arriving at a percentage change over a 20 year period

are based. As in Table 11, results for Pakistan have

been included in Table 12, but it is important to

note that they are based on calculations using only

a seven year span of data.

Analysis

Listed in Table 13 are the number of sample

countries examined in this chapter which fall into

each of the categories of development. Also contained

there is the number of countries in each of these cate-

gories having an increase of 100 per cent or more, and

the number having an increase of 50 per cent or more.

In the first two columns of Table 13 it may be

seen that 17 of the 47 sample countries fall into

Category V of development. From the next column it

may be seen that none of these 17 countries in Category

V had an increase of 100 per cent or over. One may

observe from the last column of Table 13 that two of

the countries in Category V had an increase of 50

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[7]_Ibid._

TABLE 13

NUMBER OF COUNTRIES IN VARIOUS CATEGORIES OF DEVELOPMENT HAVING
50 AND 100 PER CENT OR MORE INCREASES IN "GOVERNMENT
CONSUMPTION EXPENDITURE AS A PERCENTAGE OF
GROSS DOMESTIC PRODUCT" OVER
20 YEAR PERIOD

| Category of Development | Number of Countries in Category | | |
| | Total | Having Increase of at Least | |
		100 Per Cent	50 Per Cent
V	17	0	2
IV	3	0	0
III	8	1	1
II	7	1	3
I	12	2*	5*
Total	47	4	11

Source: Calculated from data in Table 10.

*Pakistan was excluded from the groups of countries in Category I of development considered as having 50 and 100 per cent increases, because its projected increase was based on only a seven year span of data.

per cent or more.

None of the three countries in Category IV
had an increase of as much as 50 per cent, while one
of the eight countries in Category III had an increase
of 100 per cent or more. One of the seven countries
in Category II had an increase of 100 per cent or more,
while three of these seven countries had increases of
50 per cent or more.

Pakistan was omitted from the countries in
Category I of development considered as having a 100
per cent increase, because the calculations for Pakistan
were based on only a seven year span of data. Thus,
in Table 13, two rather than three of the 12 countries
in Category I were considered as having a 100 per cent
increase--and five rather than six of the countries in
Category I were considered as having at least a 50 per
cent increase. Even so, Category I had a larger number
of countries experiencing these 50 and 100 per cent
increases than did any of the other categories.

So few countries had increases of 100 per cent
or more (only 4) that little information is provided
by this. Eleven of the 47 sample countries had increases
of 50 per cent or more, and this projection seems to be
more informative. Categories I and II contain the
largest proportions of countries experiencing increases
of 50 per cent or more--with five of the 12 Category I

countries and three of the seven Category II countries

having increases of this magnitude. Category III

contains the next largest proportion of countries

experiencing increases of 50 per cent or more--with

one of its eight countries having this increase. Next

is Category V with two of its 17 countries having an

increase of 50 per cent or more over the 20 year per-

iod. Last is Category IV, in which none of the three

countries has an increase of as much as 50 per cent.

Another Way of Analyzing This Aspect

Another way of examining this aspect of Pro-

fessor Rostow's theory is to average the values for

the increases in government as a percentage of product

("Government Consumption Expenditure as a Percentage

of Gross Domestic Product") for the countries in each

of the five categories of development. These calcula-

tions were conducted for this study, and, where a coun-

try had two series of data, the two values were first

averaged and then the single value was used.

These average values for each category of

development are contained in Table 14. The average

value of increase was the highest (56.2 per cent) for

Category II of development, followed by an average

value of 43.0 per cent for Category I. Next came

Category IV with an average value of 33.2 per cent,

TABLE 14

PERCENTAGE CHANGE OF "GOVERNMENT CONSUMPTION
EXPENDITURE AS A PERCENTAGE OF GROSS
DOMESTIC PRODUCT" OVER 20 YEAR
PERIOD, AVERAGE BY CATEGORY
OF DEVELOPMENT

Category of Development	Percentage Change in Government Consumption Expenditure as a Percentage of Gross Domestic Product over 20 Year Period
V	19.0
IV	33.2
III	18.2
II	56.2
I	43.0

Source: Calculated from data in Table 10.

followed by Category V with an average value of 19.0 per cent, and then Category III with an average value of 18.2 per cent.

Interpretation

It appears that few countries in the world today--and of the countries examined in the present study--are in Professor Rostow's lowest (traditional society) stage of development. Because of this, and because of the briefness of the take-off stage, this tends to put Professor Rostow's preconditions and take-off stages near the bottom of the ranking of countries examined in the present study.

Thus, the relatively high proportions of countries in Categories I and II experiencing increases of 50 (and 100) per cent or more over a 20 year period of time are noteworthy. Referring to Table 13, relatively high proportions of the Category I and Category II countries in the sample examined seem to have experienced the "quick emergence" of an enlarged governmental structure as compared to the other categories of development. Further, this is supported by the relatively high average percentage increases found in Table 14 for the countries in Categories I and II of development as compared to the averages for the countries in the other categories of development.

One of the primary limitations of this evidence is that data for Government Consumption Expenditure, which are broken down into components (i.e., "Civil" and "Military" sectors) are available for only one third of the sample countries that experienced increases of 50 per cent or more over the 20 year period. Although the data which are broken down for these countries indicate that such things as increases in military expenditures are not responsible for these rapid increases in the proportionate size of the government sector, this does not fully compensate for the fact that these data are not available for the remainder of the countries experiencing increases of this magnitude.

Another qualification to the analysis stems from the brief span of data examined for each of the 47 sample countries. It has been possible to examine only the stages that these countries were in during the span of data examined. Thus, of the 47 countries examined in this chapter, only a fraction of them were experiencing Professor Rostow's take-off stage during the span of years covered by the data.

A number of critics have contended that no valid empirical evidence has been found indicating that distinguishable breaks, or changes, occur over short spans of time--in the manner suggested by

Professor Rostow--as nations move along the path

toward economic development. They believe that the

changes which nations go through occur gradually.[8]

Professor Kuznets and others made their empirical

examinations of the long-term, historical evidence

on the economic development of a few, presently

developed, Western nations. They found no evidence

indicating the occurrence of distinct changes over

short spans of time.

The present study has found that distinct

differences in the percentage changes of government

as a percentage of product over a short span of time

are observable for groups of nations at various levels

of economic development in the sample countries exam-

ined. Certain "limitations" were encountered with

the data examined in this chapter (this was discussed

in detail in the second section of the chapter). Also,

there is no reason to believe that the categories of

development examined in this study necessarily coin-

cide with Professor Rostow's stages of development

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[8]Henri Baudet and J. H. van Stuijvenberg, "Ros-
tow's Theory on Growth," Weltwirtschaftliches Archiv,
Vol. XC, Hft. 1 (1963), pp. 72-73; A. K. Cairncross,
"The Stages of Economic Growth," Economic History
Review, Second Series, Vol. XIII, No. 3 (April, 1961),
p. 454; Everett E. Hagen, On the Theory of Social
Change: How Economic Growth Begins (Homewood, Illinois:
Dorsey Press, 1967), p. 518; and Simon Kuznets, Economic
Growth and Structure: Selected Essays (New York: W.
W. Norton & Company, 1965), p. 232.

because the definitions for these categories and stages
are based on different criteria.

Keeping these limitations in mind, relatively
larger proportions of the countries in Categories I
and II of development (the categories containing the
least developed countries) experienced a high rate of
increase in government as a percentage of product over
a short period of time than did the countries in the
other categories of economic development. It also
found that the average percentage increases in govern-
ment as a percentage of product were relatively higher
for Categories I and II of development than they were
for the other categories of development.

Summary

It could not be determined in all cases whether
increases in military expenditures had a large part of
the responsibility for increases in government expendi-
tures. This considerably weakens the present analysis.
The analysis of the available data indicated that
observable differences in the percentage changes in
government as a percentage of product over short
spans of time occur as nations move along the path
of increasing economic development. In these terms,
Categories I and II (taken as a unit) are dif-
ferentiated from Category III (the next highest

category of development).

The evidence indicated that a rapid expansion of the government sector occurred for the sample countries in Categories I and II of development. The results in the previous chapter were that a rapid increase in investment as a percentage of product occurred primarily during Category I of development. Although Professor Rostow attributes both of these characteristics to his take-off stage, this implies that the rapid expansion of the government sector continues somewhat longer than the rapid increase in investment.

As in Chapter VI the cluster of sample countries at the lower end of Professor El-Kammash's ranking experiencing a rapid increase in government as a percentage of product would appear to lend support to Professor Rostow's statement if it could be determined that these countries were in his take-off stage. Unfortunately, as was the case in Chapter VI, it was not possible to determine on the basis of Rostow's other take-off stage criteria more than a limited probability that this was so.

APPENDIX TO CHAPTER VII

APPENDIX TO CHAPTER VII

Table 15 lists the sample countries examined
in this chapter, and it ranks them according to dimin-
ishing level of economic development, with the countries
grouped into categories according to level of economic
development. Indicated in the last column is whether
the data on Government Consumption Expenditure for
each of these countries were broken down in the vari-
ous issues of the United Nations Yearbook of National
Accounts Statistics. For 25 of these 47 countries,
breakdowns in government expenditure data were avail-
able at least to the extent of providing data on the
"Military" and the "Civil" sectors.

In Table 16 is similar information for the
countries experiencing increases of 50 per cent or more
in government as a percentage of product over the 20
year period. Breakdowns in government expenditure
data were available for four of the 12 countries con-
tained in Table 16.

It appears that countries higher along the
path of economic development have higher percentages
of their products devoted to government expenditure.

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TABLE 15

SAMPLE COUNTRIES EXAMINED IN THE
PRESENT ANALYSIS

Country Number	Country	Category of Development	Data for Government Consumption Expenditure Broken Down into Sectors
1	United States	V	Yes
2	Canada	V	Yes
3	Switzerland	V	Yes
4	New Zealand	V	Yes
5	Sweden	V	Yes
6	Australia	V	Yes
7	Luxembourg	V	Yes
8	Belgium	V	Yes
9	United Kingdom	V	Yes
10	Denmark	V	Yes
11	Norway	V	Yes
12	France	V	Yes
13	Finland	V	Yes
14	West Germany	V	Yes
15	Netherlands	V	Yes
16	Austria	V	Yes
17	Japan	V	No
18	Argentina	IV	No
19	Puerto Rico	IV	No
20	Italy	IV	Yes
21	Venezuela	III	No
22	Chile	III	No
23	Union of South Africa	III	No
24	Yugoslavia	III	Yes
25	Costa Rica	III	No
26	Peru	III	No
27	Bolivia	III	Yes
28	Spain	III	No
29	Brazil	II	No
30	Mexico	II	No

TABLE 15 (Cont.)

Country Number	Country	Category of Development	Data for Government Consumption Expenditure Broken Down into Sectors
31	Portugal	II	Yes
32	Ecuador	II	No
33	Thailand	II	No
34	Burma	II	No
35	Morocco	II	No
36	Malaysia	I	Yes
37	Colombia	I	No
38	Turkey	I	No
39	Guatemala	I	No
40	Philippines	I	No
41	Honduras	I	Yes
42	Ceylon	I	No
43	El Salvador	I	No
44	Pakistan	I	No
45	South Korea	I	Yes
46	Nigeria	I	Yes
47	Mauritius	I	Yes

Source: Obtained by examining data contained in United Nations, Yearbook of National Accounts Statistics, 1957, 1958, 1959, 1961, 1962, 1966, and 1967.

TABLE 16

SAMPLE COUNTRIES HAVING 50 PER CENT INCREASE AND OVER

Country Number	Country	Category of Development	Per Cent Increase of Government Consumption Expenditure as a Percentage of Gross Domestic Product	Data for Government Consumption Expenditure Broken Down into Sectors
10	Denmark	V	51.0	Yes
11	Norway	V	60.0	Yes
25	Costa Rica	III	143.8	No
30	Mexico	II	63.4	No
34	Burma	II	77.6	No
35	Morocco	II	181.5	No
36	Malaysia	I	113.5	Yes
40	Philippines	I	52.5	No
41	Honduras	I	74.0	No
44	Pakistan	I	182.9	No
46	Nigeria*	I	Over 100	Yes
47	Mauritius	I	76.9	No

Source: Calculated from data contained in United Nations, Yearbook of National Accounts Statistics, 1957, 1958, 1959, 1961, 1962, 1966, and 1967.

*A discussion of how the estimate for Nigeria was determined is contained in the Appendix to Chapter VI.

The mean value of the data for each country in Table 9 has been calculated by computer. Where a country had two series of data, these were averaged to arrive at a single value. An average value was calculated for each of the five categories of development using this data. The resulting figures are listed in Table 17 and plotted in Figure 7.

These average values for each category of development are positively related to an increasing level of economic development. Generally, there are higher values for the categories higher in terms of level of economic development. The average value for Category I is 10.1, the value for Category II is 11.0, and the value for Category III is 10.6. The average value for Category IV is 12.2, and the average value for Category V is 13.5.

These results for the 47 countries examined indicate that, in moving from countries which are lower to those which are higher in terms of level of economic development, government expenditure becomes an increasingly large percentage of national product.
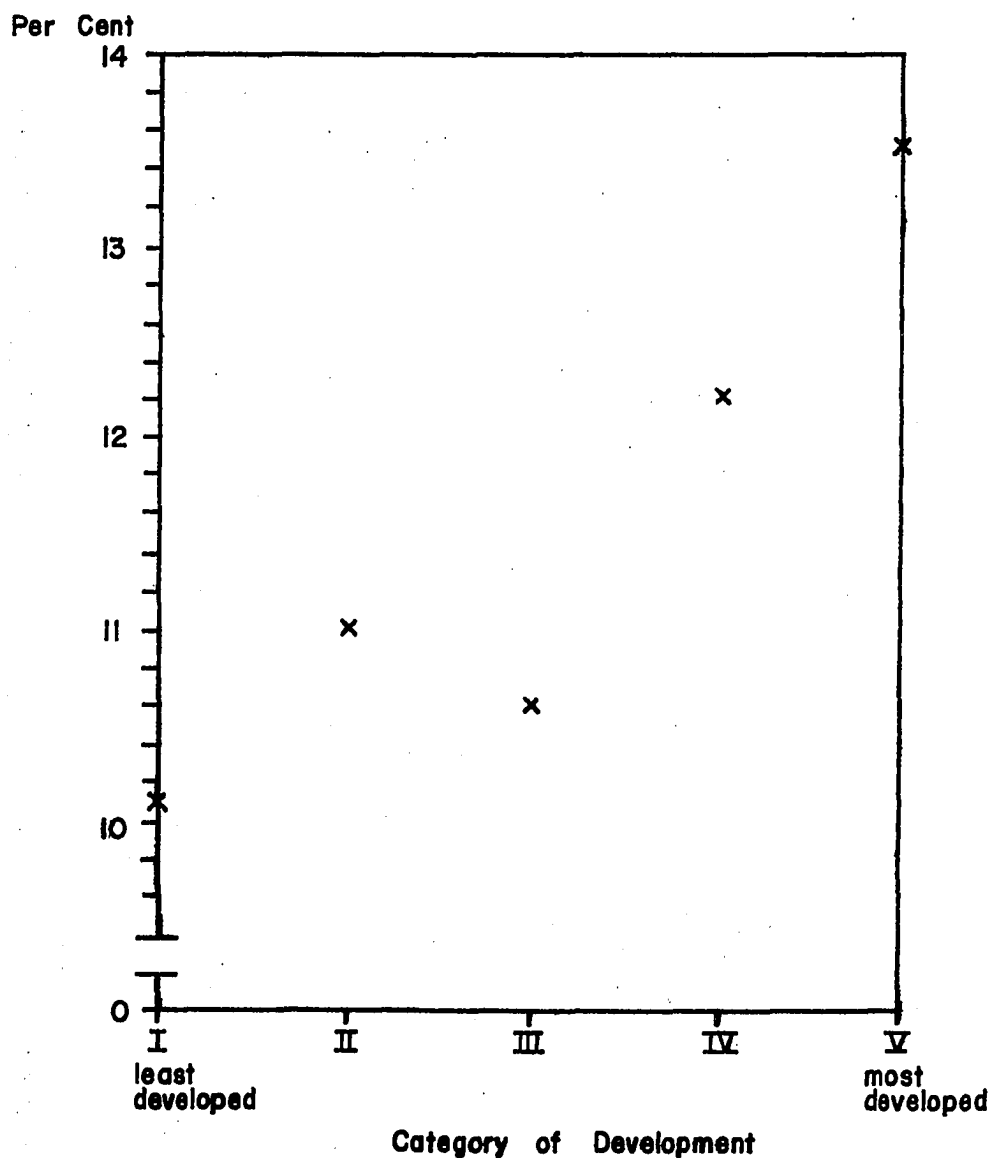
TABLE 17

MEAN VALUE OF GOVERNMENT CONSUMPTION EXPENDITURE
AS A PERCENTAGE OF GROSS DOMESTIC PRODUCT,
AVERAGE FOR 47 COUNTRIES BY CATEGORY OF
DEVELOPMENT, 1950-1966

Category of Development	Mean Value
V	13.5
IV	12.2
III	10.6
II	11.0
I	10.1

Source: Calculated from data in Table 9.

FIGURE 7

MEAN VALUE OF GOVERNMENT CONSUMPTION
EXPENDITURE AS A PERCENTAGE OF GROSS
DOMESTIC PRODUCT, AVERAGE FOR 47
COUNTRIES, BY CATEGORY OF DEVELOPMENT,
1950 - 1966

Source: Data from Table 17.

CHAPTER VIII

PROPORTION OF URBAN TO TOTAL POPULATION,

SELECTED COUNTRIES

Introduction

In this chapter Professor Rostow's statement

concerning the changing proportions of urban to total

population is examined. This line of approach was

suggested in the writings of Professor Simon Kuznets

of Harvard University.[1]

In discussing the advancement of nations into

the "Age of High Mass-Consumption," Professor Rostow

states:

> As societies achieved maturity . . . the
> structure of the working force changed in ways
> which increased . . . the proportion of urban
> to total population.[2]

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[1] Simon Kuznets, Economic Growth and Structure:
Selected Essays (New York: W. W. Norton & Company,
1965), p. 213.

[2] W. W. Rostow, The Stages of Economic Growth:
A Non-Communist Manifesto (Cambridge: Cambridge University Press, 1960), p. 10.

From the above statement it follows that Ros-
tow is suggesting that as nations become more devel-
oped the proportion of their populations which is
rural decreases. Although it is generally accepted
in the field of economic development that as coun-
tries become more developed their populations become
more urban, it was decided to examine this statement
by Professor Rostow since a sample of countries had
already been selected for the present study which
were ranked according to level of economic develop-
ment. Also, since the countries in this sample had
been ranked on the basis of four variables, none of
which was percentage of urban to total population,
an examination of this aspect was felt to serve
as a useful cross-check on the ranking of countries
which had been used for the analyses in the previous
chapters.

Factors Affecting the Present Analysis

Although the United Nations has made great
strides in improving the uniformity of the data it
publishes, major differences still exist in its popu-
lation data. Not only does the reliability of the
population data decrease as one goes from the more
developed to the less developed countries, but also
significant differences exist from nation to nation

in the definition of "urban" and "rural." Thus the
population data published by the United Nations vary
accordingly, because of national differences in data
submitted to it for publication.

It was considered beyond the scope of this
study to attempt adjustments in the data beyond those
made by the United Nations. In addition, Professor
El-Kammash's 49 sample countries are ranked "ordi-
nally" in terms of level of economic development,
and any such adjustments would do little to improve
the present analysis. Therefore, the data for this
chapter were obtained, without any further modifi-
cation, from the United Nations Demographic Yearbook,
1967.[3] In order that the reader may have some basis
for judgment, abbreviated national definitions of
"urban" for the countries examined in this chapter
are contained in its Appendix.

Procedure and Results

Data for total population and for rural pop-
ulation were obtained from Table 5, pp. 132-205 of
the United Nations Demographic Yearbook, 1967; these

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[3]United Nations, Demographic Yearbook, 1967
(New York: Statistical Office of the United Nations,
1968).

data were for the "latest available year, 1955-1967."[4]

Using this information, rural population as a percent-

age of total population was calculated for as many of

Professor El-Kammash's 49 countries as had satisfac-

tory data.

These percentages are presented in Table 18

and plotted in Figure 8. Either rural or urban pop-

ulation could have been used in conjunction with

total population to calculate the percentages as long

as consistency were used; the trends would have been

just the reverse of each other. Rural population as

a percentage of total population was arbitrarily

chosen for calculations performed in this study. The

population data for some of the countries examined

were broken down into three classifications: urban,

semi-urban, and rural. For the calculations con-

ducted, semi-urban was lumped together with urban

rather than with rural.

From Table 18 and Figure 8 one may see that,

generally, the more developed sample countries have a

smaller proportion of rural to total population, while

the less developed sample countries have a higher pro-

portion of rural to total population.

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[4]_Ibid._, p. 132.

TABLE 18

RURAL POPULATION AS A PERCENTAGE OF TOTAL
POPULATION, LATEST AVAILABLE YEAR,
1955-1967

Country Number	Category of Development	Country	Rural Population as a Percentage of Total Population
1	V	United States	30.1
2	V	Canada	30.4
3	V	Switzerland	48.7
4	V	New Zealand	36.1
5	V	Sweden	22.6
6	V	Australia	17.8
7	V	Luxembourg	37.8
8	V	Belgium	--
9	V	United Kingdom	21.1
10	V	Denmark	54.3
11	V	Norway	42.8
12	V	France	37.0
13	V	Finland	57.2
14	V	West Germany	--
15	V	Netherlands	21.6
16	V	Austria	50.0
17	V	Japan	31.9
18	IV	Argentina	--
19	IV	Puerto Rico	55.9
20	IV	Italy	--
21	III	Venezuela	32.6
22	III	Chile	31.8
23	III	Union of South Africa	53.3
24	III	Yugoslavia	71.6
25	III	Costa Rica	65.5
26	III	Peru	52.6
27	III	Bolivia	--
28	III	Spain	--
29	II	Brazil	53.7
30	II	Mexico	49.3

TABLE 18 (Cont.)

Country Number	Category of Development	Country	Rural Population as a Percentage of Total Population
31	II	Portugal	77.3
32	II	Ecuador	64.2
33	II	Thailand	--
34	II	Burma	--
35	II	Morocco	70.7
36	I	Malaysia	85.0
37	I	Columbia	48.0
38	I	Turkey	73.7
39	I	Guatemala	66.0
40	I	Philippines	--
41	I	Honduras	76.8
42	I	U.A.R. (Egypt)	62.0
43	I	Ceylon	81.2
44	I	El Salvador	61.5
45	I	Pakistan	86.4
46	I	India	82.0
47	I	Korea (South)	72.0
48	I	Nigeria	83.9
49	I	Mauritius	--

Source: Calculated from data contained in Table 5, pp. 132-205, of United Nations, Demographic Yearbook, 1967 (New York: Statistical Office of the United Nations, 1968). (These data are for the "latest available year, 1955-1967.")

--Data not broken down into "Urban" and "Rural" for this country.

FIGURE 8

RURAL POPULATION AS A PERCENTAGE OF TOTAL POPULATION, LATEST AVAILABLE YEAR, 1955 - 1967
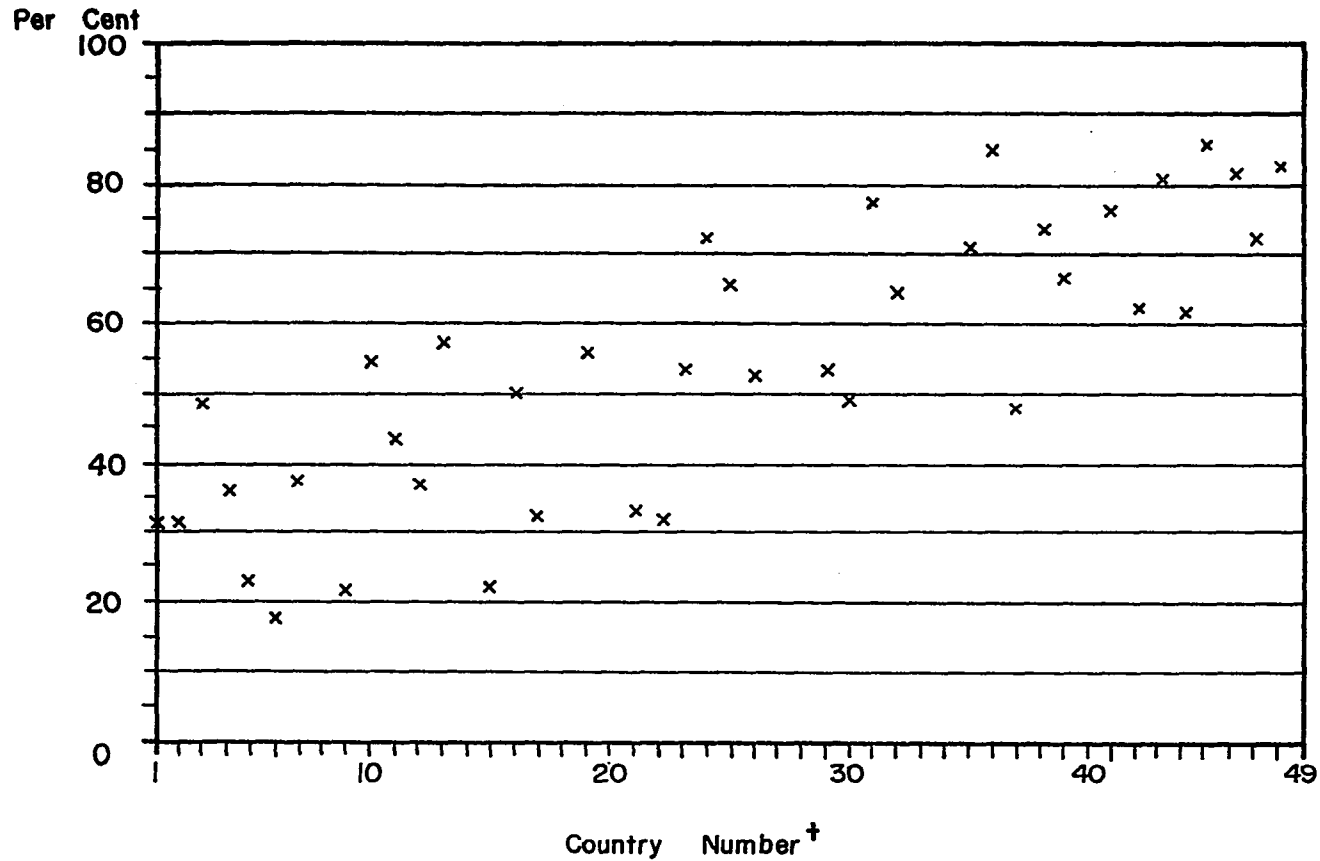
Country Number†

Source: Data from Table 18; for list of countries, see Table 18.
†Larger number indicates a lower level of economic development.

As a further step, averages were calculated
for each of Professor El-Kammash's categories of
economic development. The results of these calcula-
tions are contained in Table 19 and plotted in Figure
9. It may be observed from these that the average
values of rural as a percentage of total population
generally increase as one proceeds from the categories
containing the more developed nations (e.g., Category
V) to those containing the less developed nations (e.g.,
Category I). The single exception to this trend is
the value of 55.9 per cent for Category II of develop-
ment. Although three of Professor El-Kammash's 49
countries are in this category of development, data
were available for only one of these countries, and
this may explain the deviation from the general trend.

Interpretation

The 49 countries ranked according to level of
economic development by Professor El-Kammash, and used
as sample countries for the analyses conducted in
Chapters VI and VII of this study, are in an ordinal
relationship with each other in terms of level of
economic development. In addition, the definitions
of what constitutes "urban" and "rural" population
vary from country to country; and certain factors such
as economic specialization, geography, climate, and

TABLE 19

RURAL POPULATION AS A PERCENTAGE OF TOTAL
POPULATION, AVERAGE FOR 49 COUNTRIES BY
CATEGORY OF DEVELOPMENT, LATEST
AVAILABLE YEAR, 1955-1967

Category of Development	Percentage of Population Rural, Average by Category of Development
V	36.0
IV	55.9
III	51.2
II	63.0
I	73.2

Source: Calculated from data contained in
Table 18.

FIGURE 9

RURAL POPULATION AS A PERCENTAGE OF
TOTAL POPULATION, AVERAGE FOR 49 COUNTRIES
BY CATEGORY OF DEVELOPMENT, LATEST
AVAILABLE YEAR, 1955 - 1967
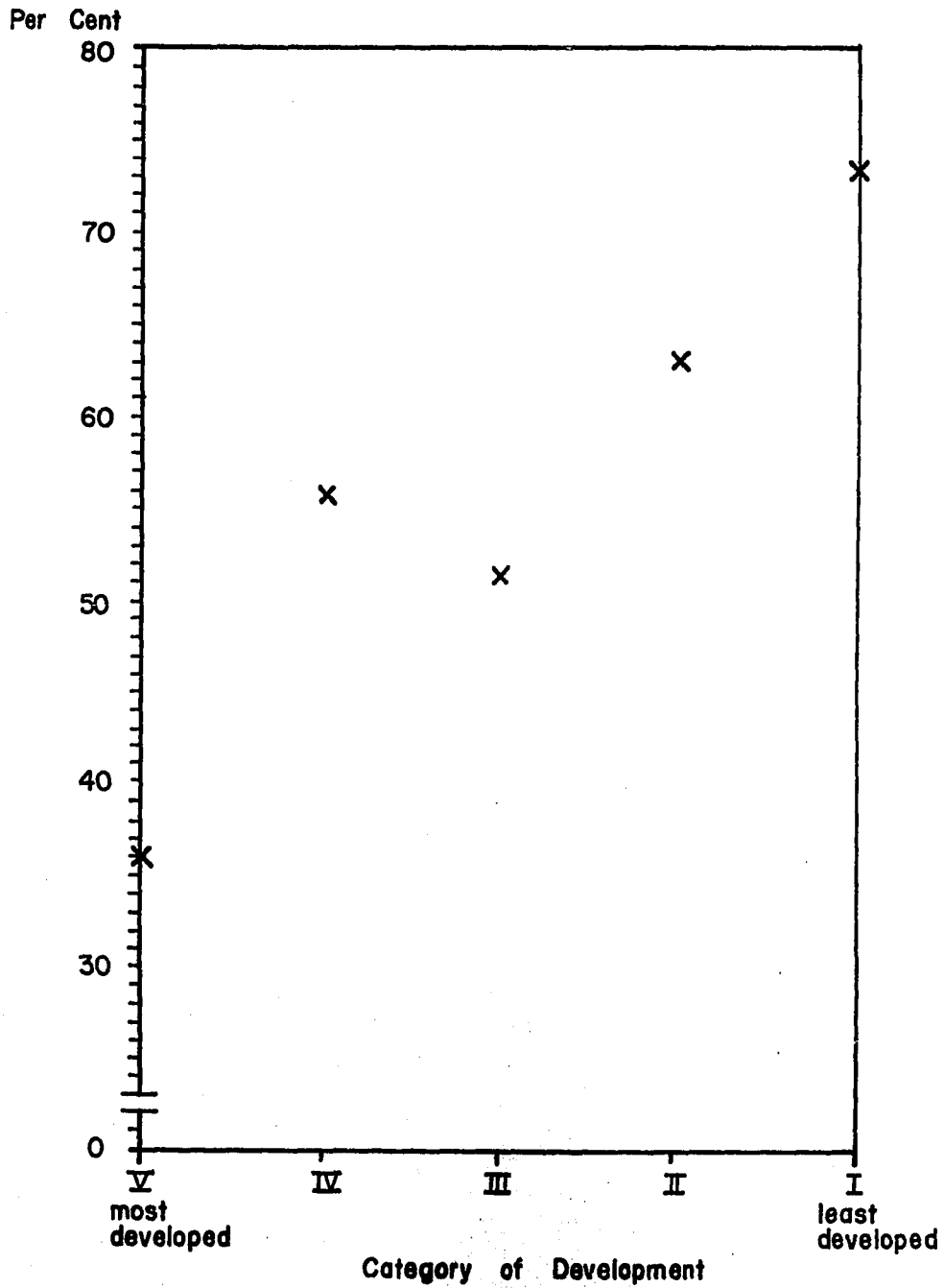
Source: Data from Table 19.

sociological factors (i.e., that rural occupations
are felt to be "healthy" and "morally desirable" for
a country to encourage) may affect the balance of
rural to urban population.

In spite of these factors, it may be inferred
from Tables 18 and 19 and Figures 8 and 9 that a posi-
tive correlation exists between the ranking of sample
countries examined in this study and the percentage of
their total population "urban." Conversely, there is
a strong inverse relationship apparent between the
economic level of these countries and the percentage
of their total population "rural."

APPENDIX TO CHAPTER VIII

APPENDIX TO CHAPTER VIII

Definitions of "urban" vary greatly from country to country. Although the United Nations goes to great ends to make its data as uniform as possible, major national differences in these definitions exist. The following are abbreviated definitions of "urban" for most of the countries examined in the present study:

UNITED STATES. All incorporated and unincorporated places of 2,500 inhabitants or more, and the towns, townships, and counties classified as urban. Towns in the New England states, townships in New Jersey and Pennsylvania, and counties in any state which did not include a dependent incorporated municipality and had either a population of 25,000 or more or a population of 2,500 to 25,000 and a density of 1,500 persons or more per square mile are classified as urban.

CANADA. Cities, towns and villages of 1,000 or more inhabitants, whether incorporated, including urbanized fringes of cities classed as metropolitan areas and other major urban areas. In 1961, also including urbanized fringes of certain smaller cities if the population of city and its urban fringe was 10,000 or more.

SWITZERLAND. Communes of 10,000 or more inhabitants including suburbs.

NEW ZEALAND. 1956: Central cities, adjacent boroughs and the urbanized parts of countries contiguous to them. 1961: All cities, boroughs and town districts.

SWEDEN. Built-up areas with at least 200 inhabi-
tants and usually not more than 200 metres between
houses.

AUSTRALIA. Cities and towns of 1,000 or more
inhabitants and contiguous urban developments.

LUXEMBOURG. Communes having more than 2,000
inhabitants in the administrative centre (1947).

UNITED KINGDOM:
    England and Wales. Area classified as urban
for local government purposes, i.e., county bor-
oughs, municipal boroughs and urban districts.
    Northern Ireland. Administrative county
boroughs, municipal boroughs, and urban districts.
    Scotland. Cities and all boroughs.

DENMARK. Agglomerations of 200 or more inhabitants.

NORWAY. Urban: Localities or population clusters
of 2,000 or more inhabitants, irrespective of
administrative divisions, with usually not more
than 50 metres between houses, but including
smaller groups of houses naturally belonging to
a cluster even if they are more than 50 metres
distant. Semi-urban: Localities or population
clusters of 200-1,999 inhabitants, with distances
between houses as specified above.

FRANCE. Communes containing an agglomeration of
more than 2,000 inhabitants living in contiguous
houses or with not more than 200 metres between
houses, and communes of which the major part of
the population is part of a multi-communal agglo-
meration of this nature.

FINLAND. Non-administrative agglomerations, i.e.,
almost all groups of buildings occupied by at
least 200 people and with usually not more than
200 metres between houses.

NETHERLANDS. All municipalities with at least
one population cluster of 5,000 or more inhabi-
tants and other municipalities in which not more
than 20 per cent of the economically active male
population is engaged in agriculture.

AUSTRIA. Communes (Gemeinden) of more than 5,000
inhabitants.

JAPAN. Urban municipalities (shi and ku of Tokyo-to) usually having 30,000 or more inhabitants and which may include some rural area as well as urban cluster.

PUERTO RICO. Places of 2,500 or more inhabitants and densely settled urban fringes of urbanized areas.

VENEZUELA. Urban: Populated centres (centros poblados) of 2,500 or more inhabitants. Semi-urban: Populated centres (centros poblados) of 1,000-2,499 inhabitants.

CHILE. Populated centres which have definite urban characteristics contributed by certain public and municipal services.

UNION OF SOUTH AFRICA. All areas of 500 or more inhabitants, and adjoining suburban areas, but excluding predominantly rural agricultural settlements, temporary villages for construction work in rural areas and alluvial diamond diggings; well-established towns of fewer than 500 inhabitants but at least approximately 100 white inhabitants, and with specified urban characteristics; and "rural" portions of certain districts in which large metropolitan areas fall and where the percentage of the "rural" population is small compared with the urban and a considerable proportion of the workers follow urban-type occupations.

YUGOSLAVIA. Localities of 15,000 or more inhabitants; localities of 5,000-14,999 inhabitants of which at least 30 per cent are not engaged in agriculture; localities of 3,000-4,999 inhabitants of which at least 70 per cent are not engaged in agriculture; and localities of 2,000-2,999 inhabitants of which at least 80 per cent are not engaged in agriculture.

COSTA RICA. "Metropolitan area" of San José city (excluding rural sector of district of Las Pavas), Cartago city, and administrative centres of all cantons except San Pablo (province of Heredia), Nandayure (province of Guanacaste) and Buenos Aires (province of Puntarenas).

PERU. Capitals of districts and those populated centres with such urban characteristics as streets, plazas, water supply systems, sewerage systems, electric lights, etc.

BRAZIL. Urban and suburban zones of administrative centres of municipios and distritos.

MEXICO. Localities of 2,500 or more inhabitants.

PORTUGAL. Agglomerations of 2,000 or more inhabitants (1940).

ECUADOR. Cities, capitals of provinces and cantons.

MOROCCO. 117 urban centres.

MALAYSIA:
    Sabah. Towns of 3,000 or more inhabitants, i.e., Sandakan, Jesselton, Tawaua, Kudat and Victoria (Labuan).
    Sarawak. Kuching municipality and towns of 3,000 or more inhabitants, i.e., Siba, Miri, Simanggang, Bintulu, Sarikei and Lutong.

TURKEY. 1955: Administrative centres of provinces and districts. 1960: Localities of more than 10,000 inhabitants.

HONDURAS. Localities of 1,000 or more inhabitants having essentially urban characteristics.

U.A.R. (EGYPT). Cities, including the five largest cities, which are also governorates, and the capitals of provinces and districts.

CEYLON. Municipalities, urban councils, local board areas and towns proclaimed under the Births and Deaths Registration Ordinance.

EL SALVADOR. Administrative centres of municipios.

PAKISTAN. Municipalities, civil lines, cantonments not included within municipal limits, any other continuous collection of houses inhabited by not less than 5,000 persons and having urban characteristics and also a few areas having urban characteristics but fewer than 5,000 inhabitants.

INDIA. Towns (places with municipal corporation, municipal area committee, town committee, notified area committee or cantonment board); also, all places having 5,000 or more inhabitants, a density of not less than 1,000 persons per square mile, at least three fourths of the adult male population employed in pursuits other than agriculture and pronounced urban characteristics.

KOREA (SOUTH). Seoul city and municipalities of
5,000 or more inhabitants (shi).[5]

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[5]United Nations, Demographic Yearbook, 1967
(New York: Statistical Office of the United Nations,
1968), pp. 2-4.

CHAPTER IX

SUMMARY

Introduction

Crucial to Professor Rostow's theory is the
implicit notion that distinct, observable changes
occur between successive development stages which he
believes nations go through. The "take-off stage" is
thought by many to be the most original and important
contribution of his theory.

There has been much comment and criticism of
Professor Rostow's theory, and of his take-off concept
in particular, but most of this has been on theoreti-
cal rather than empirical grounds because of the dif-
ficulties associated with testing his theory empirically.
Most of these theoretical comments have centered
around the criticism that Rostow's theory is vague
and that many of his concepts are not rigorously
enough defined. In addition, it has been argued that
his theory is based mainly on the experiences of a few
presently developed "Western" nations and, thus, may

have limited applicability to the nations of the rest

of the world.

Professor Simon Kuznets has been the central

figure in examining Professor Rostow's theory empir-

ically and in compiling the work done by others, as a

supplement to his own work, in this area. The

approach used by Kuznets, and others, has been to work

with historical time series covering long periods of

time for approximately a dozen presently developed

nations, all "Western" with the exception of Japan.

Because of data limitations for the early time periods

examined for these countries, this approach has led to

results which, while not conclusive, have lent no sup-

port to Professor Rostow's theory and to the implicit

notion that discrete, observable changes occur as

nations proceed along the path of economic development.

Approach and Results of the Present Study

The present study employed a sample consisting

of a large proportion of the countries in the world

ranked according to level of economic development.

The ranking used was that developed by Professor Magdi

M. El-Kammash because it considered more factors than

other methods. The 49 countries ranked according to

level of economic development in this study contain

slightly more than half of the world's population,

while the 46 of these examined in Chapter VI, and the
47 examined in Chapter VII, of the present study account
for somewhat more than one third of the world's popu-
lation.[1]

Rostow's take-off stage is generally understood
to be a period of about twenty years, and it is per-
haps the most readily testable aspect of his theory.
United Nations time series data are now available for
some of the countries in the world for a period of
seventeen years, or the greater part of the time
required for Professor Rostow's take-off stage to
occur.

Previous researchers analyzed long-term his-
torical time series data for approximately a dozen
presently developed nations to see if support could
be found for the take-off period concept. In par-
ticular, they attempted to determine if abrupt changes
in investment proportions occurred during the take-off
period which distinguished it from the other "stages"
which nations go through. This method did not support
Professor Rostow's theory.

The present study carried out a time series
analysis using available United Nations data for the

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[1]Calculated using data from, United Nations,
Demographic Yearbook, 1967 (New York: Statistical
Office of the United Nations, 1968).

ranking of sample countries selected for examination.
The major hypothesis examined was that a "cluster" of
countries at the lower, less developed end of the
ranking of sample countries would exhibit character-
istics appropriate to Professor Rostow's take-off
stage.

"Gross Domestic Fixed Capital Formation as a
Percentage of Gross Domestic Product" and "Government
Consumption Expenditure as a Percentage of Gross
Domestic Product" were calculated for the sample
countries for as many years as data were available--
17 year spans of data were common, although 14-16
year spans of data were used in many cases. A linear
regression line was fitted to the percentages for each
country and then extrapolated a sufficient number of
additional years to yield a 20 year time span.

A 20 year period was chosen for three reasons.
First, this is a reasonable interpretation of the
length of time required for Professor Rostow's take-
off stage to occur. Second, with spans of data up to
17 years in length available, it required, at a mini-
mum, a projection of only three years. Third, pro-
jecting the available data of each of these countries
to a period totaling 20 years in length led to a "com-
parability" of the change in investment as a percent-
age of product, and in government as a percentage of

product, for each of these countries because of the
similarity of time span.

Two of Professor Rostow's conditions which
must be fulfilled in order for the take-off stage to
occur--and which set it apart from the other stages--
require that there be a rapid increase in investment,
and of government, as a proportion of a nation's
economy during the take-off stage.

Although a seemingly large sample of countries
was examined in the present study, it must be realized
that this study examined only a brief span of data for
each of its sample countries (which were ranked accord-
ing to level of economic development) and therefore
was able to examine only the "stages" that these coun-
tries were in during the span of data examined. Only
a small proportion of these were in Professor Rostow's
take-off stage.

A small "cluster" of countries near the bottom
of the ranking of sample countries showed signs of
exhibiting Professor Rostow's investment characteris-
tic of the take-off stage. A smaller, and less cer-
tain "cluster" in this area appeared to exhibit his
specified government characteristic. Nevertheless,
there was not sufficient evidence to determine more
than a limited probability that these countries were
in Professor Rostow's take-off stage.

Both investment and government as a proportion
of a nation's economy experienced rapid increases in
magnitude for some countries near the bottom of those
in the sample examined, and evidence appeared for a
characteristic not mentioned, or hypothesized by Ros-
tow, that the rapid increase in government proportions
appeared to terminate somewhat later (higher in the
ranking of countries) than did the rapid increase in
investment proportions. The available evidence for
the sample countries also indicated distinct breaks
between arbitrarily chosen clusters of countries in
terms of the rate of increase in investment proportions
and in government proportions, providing some basis
for the contention that distinct, observable changes
occur as countries proceed along the path of increas-
ing economic development--a necessary requirement
which must be fulfilled in order for any historical
stages theory of economic development to be valid.

As a sidelight to this research, several
lesser aspects of Professor Rostow's theory were
examined. One of his statements implied that invest-
ment becomes an increasingly large proportion of a
nation's economy as it becomes more developed. An
examination of the ranking of sample countries used
in the present study indicated this to occur. In
addition, Rostow stated that as nations become more

developed a larger percentage of their population becomes "urban." An analysis of the sample countries showed a positive correlation between the level of a country's economic development and the percentage of its population living in urban areas.

The present study perhaps has been no more conclusive in terms of evaluating Professor Rostow's historical stages theory than previous empirical studies. However, in conjunction with these other studies, it should serve to broaden the realm of available knowledge in this area. In summary, the present study has provided an analysis for a broad sample of countries of changes in investment proportions, government proportions, and urbanization of population which occur as nations become more highly developed.

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