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Volume Title: Commodity Flow and Capital Formation, Volume 1

Volume Author/Editor: Simon Kuznets

Volume Publisher: NBER

Volume ISBN: 0-87014-033-7

Volume URL: <http://www.nber.org/books/kuzn38-1>

Publication Date: 1938

Chapter Title: Front matter, tables of content

Chapter Author: Simon Kuznets

Chapter URL: <http://www.nber.org/chapters/c4740>

Chapter pages in book: (p. -9 - 0)

PUBLICATIONS OF THE
NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.
NUMBER 34

COMMODITY FLOW
AND CAPITAL FORMATION
VOLUME ONE

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(Resolution of October 25, 1926, revised February 6, 1933)

SIMON KUZNETS

COMMODITY FLOW
AND CAPITAL FORMATION

VOLUME ONE

NATIONAL BUREAU OF
ECONOMIC RESEARCH

NEW YORK · 1938

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FOREWORD

By capital formation we understand the addition to or draft upon existing stocks of capital goods; or the flow of means of payment that become available for the financing of additions to such stocks. In both meanings, the scope of the concept and hence of its measure will vary with the definition of capital goods; and this definition may range from the broadest that includes all economic goods to the narrowest that includes only commodities used by business enterprises.

The meaning adopted in this study is capital formation as the addition to or draft upon the stock of capital goods; we do not consider the flow of means of payment. This exclusive emphasis on the flow of commodities and services derives from the origin of the study, which was undertaken by the National Bureau of Economic Research at the request of the Committee on Credit and Banking¹ of the Social Science Research Council. It was envisaged as a first study to be followed by others, among which one would deal with the flow of funds used for financing capital investments. In view of the differences in the data available for the measurement of capital formation as a flow of commodities and services and as a flow of funds; and of the basic differences in the categories within the capital formation total to which these two approaches would give rise, it was considered best to use the two approaches as bases for two separate studies.

The basic concept in this report is *gross* capital formation, that is, the addition to or draft upon the stocks of capital goods, not adjusted for the current consumption of durable capital equipment. Part VIII does present measures of *net* capital formation; but the estimates of current consumption of durable equipment requisite for passing from gross to net capital formation are the result of an independent study by Solomon Fabricant of the National Bureau staff. These estimates will be presented in detail by Mr. Fabricant in *Capital Consumption*, recently submitted to the Directors for their approval.

The volume of gross capital formation is meas-

ured annually, for 1919 through 1935, in both current and constant prices. The estimates are mainly of: (a) the flow of movable durable capital goods to their ultimate domestic users at the cost to them; (b) the volume of construction; (c) net changes in inventories of all goods, except those covered under (a) and (b). The fourth item needed to complete the volume of gross capital formation, net changes in claims against foreign countries, is readily available in *Balance of International Payments*, a publication of the Department of Commerce. Our investigation was thus devoted primarily to the measurement of durable capital goods, volume of construction, and changes in inventories. In addition, however, we estimated the flow to ultimate domestic recipients of *all* finished commodities, not of durable capital goods alone.

The three groups of estimates required a comprehensive utilization of data on the production of commodities and related services; on transportation charges and distributive margins and the flow of finished commodities through the various distributive channels; on stocks of unfinished commodities or of finished commodities not in the hands of their ultimate consumers; and on prices needed in order to pass from values in current prices to those in constant prices.

This volume, the first of two, while discussing briefly definitions, scope, and results, is largely a detailed account of the data and statistical devices used, the decisions made at each stage of the inquiry, the assumptions implicit in the statistical operations and the probable effects of these assumptions on the reliability of the results. A more extensive discussion of the theoretical issues involved in the definitions and classifications underlying the measures and an attempt to indicate the wider bearings of these measures are deferred to the second volume.

The detailed description of the statistical groundwork is intended to satisfy several purposes. First, it should make possible a clear understanding of the scope and characteristics of the measures presented, and enable the critical student to judge the validity of the methods and the reliability of the results. Second, interest may center in par-

¹ The members of this Committee are: David Friday, Chairman; A. H. Hansen, C. O. Hardy, F. C. Mills, J. H. Riddle, W. W. Riefler, Woodlief Thomas.

particular elements in the flow of commodities and services, each of which was measured as a step preliminary to obtaining the final estimates: for example, commodity production, at producers prices; transportation and distributive charges; changes in inventories; price changes. Third, it is hoped that other students will utilize the results as materials in their own studies; and that with the accretion of new data and the increase in our understanding, the estimates will be revised and improved. In order to utilize the measures for other purposes and improve them, a complete account of the methods by which they have been derived is indispensable.

A large part of the discussion in this volume may be of interest only to technical students desirous of following through the steps in the statistical procedures. The reader interested primarily in the scope of the study and its general results will find the Introduction and the Summary in Part VIII of chief value. Those concerned with some particular aspect of commodity flow will be assisted by the outline of the report, given at the end of the Introduction, and by the list of tables and notes at the end of the volume.

A study of this scope is far beyond the efforts of an individual investigator working alone. It has been possible only with the aid of associates at the National Bureau and of outside agencies. To Solomon Fabricant I am indebted for the estimates of capital consumption and for help in combining them with the measures of gross capital formation. Throughout the study William H. Shaw has been of great assistance. He shared in making the first estimates, in the tedious but necessary effort to revise them as our understanding grew and new data became available, and in the time- and patience-consuming task of preparing the manuscript for the press; and he has written the detailed

notes that follow most of the basic tables. Mr. Shaw is now in charge of preparing estimates of capital formation for selected years back to 1880.

At various stages of the inquiry other research assistants at the National Bureau participated. Grace W. Knott was responsible for the first estimates of the commodity breakdown of sales in 1929; Edith Handler prepared the first estimates of inventories and of distributive margins; Natalie Brown, Frances Goldberg, Richard Machol, and Lawrence Robinson worked on other phases.

As indicated above, the inquiry was initiated at the request of the Committee on Credit and Banking of the Social Science Research Council; and in its early stages I profited from discussion with the members of the Committee. The Bureau of the Census was of material assistance in allowing access to unpublished data on the distribution of sales of manufacturing plants and on wholesale and retail distribution. In the task of allocating commodity production between finished and unfinished we have benefited from the advice of the commodity experts of the Bureau of Foreign and Domestic Commerce and of experts attached to various trade associations. In the study of distributive margins we were allowed access to the data of the National Retail Dry Goods Association collected through its Controllers' Congress. The measurement of the volume of construction was facilitated by consulting the details of the work of Corrington Gill, A. D. Gayer, D. L. Wickens, and Peter Stone.

I wish to thank sincerely all these individuals and organizations for their assistance and cooperation.

SIMON KUZNETS

April 1938

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