

CONTINUOUS INDEX NUMBERS AND QUANTITATIVE STUDY OF THE GENERAL ECONOMY

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1. Introduction

The practical economist, concerned with the possible effects of new taxes or other changes in government policy on the structure of the general economy, must resort to index numbers for quantitative evaluation of his qualitative conclusions. Conventional econometric theory, however, upon which he may wish to base his reasoning, finds its most rigorous expression, not in terms of index numbers, but rather in terms of systems of equations in a large and indefinite number of variables, such as the Walrasian equations of the general equilibrium [5]¹ or in dynamic analogues of the same. The problem of finding some logical or functional connection between the Walrasian and the aggregative points of view is therefore of practical as well as theoretical interest. The present paper represents a reformulation and extension of the author's previous work on this problem [2]. It is entirely self-contained, however, and can be followed without reference to the earlier material and with only the most general layman's knowledge of economic theory and terminology.

2. Classes of commodities

In what follows, the terms "commodity" and "goods" will be used synonymously to refer to anything which can command a price, including manufactured articles, patents and other rights or titles, labor or other personal services, and the use of land. The present discussion will be concerned primarily with aggregates of commodities obtained by subdividing the set of all possible commodities into mutually exclusive subclasses. The exact manner of subdivision is unimportant except that one preliminary division into four fundamental categories is essential, any convenient subdivision of these basic categories being acceptable.

Most goods are manufactured in one or more of the industrial processes of the economy. Certain goods, however, such as labor, are not. We shall denote the class of all commodities which are produced in the system by the letter "P," suggesting "products." Many goods, moreover, are used in the process of producing other goods. Let us denote the class of all such commodities by the letter "F," suggesting "factors of production."

The classes P and F are not exclusive, and the class of commodities $P \cdot F$, common to both, is customarily referred to as the class of "capital goods." Moreover, the class $\bar{P} \cdot \bar{F}$, composed of goods which belong to neither P nor F,

¹ Boldface numbers in brackets refer to references at the end of the paper (see p. 221).