

CHALLENGES OF DEVELOPMENT ECONOMICS

—Relevance of Economic Theory to Contemporary Development Problems—

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I. INTRODUCTION

ACCCELERATING ECONOMIC development in the less developed countries of the Third World is obviously a problem area in which we should look to economics, of all disciplines, for effective solutions. But is contemporary economics in the position to give the answers? Is economic theory really relevant to the problems of development in these countries? Admittedly this is not a new question, but raising it repeatedly should be an issue of intellectual conscience for any economist engaged in actual development tasks.

On the academic level, Joan Robinson felt the need to face the issue after many years of teaching students from the Indian subcontinent at Cambridge. In a gloomy mood, she asked in the Bombay *Economic Weekly* if Cambridge's traditional economics did not impart a training that was not only useless but harmful to students destined to face development problems in their own countries [15, p. 4]. The situation prompted her to write a new "text book of a somewhat unusual kind," *Exercises in Economic Analysis* [14], which does not rely on traditional concepts of equilibrium.

Gunnar Myrdal more radically denied the applicability of Western economic theory to the less developed countries. He observes that Western economic thought is burdened by doctrinaire predilections born of historical conditions in the advanced countries in which it was formulated. As economic problems have to be studied under the conditions of the less developed countries, this "will imply the final liquidation of the old laissez-faire predilections and, more specifically, the free trade doctrine and the stable equilibrium approach" [11, p. 100]. Myrdal sees a historic challenge for young economists in the developing countries today. To meet this challenge, in fact, he urges them not to be "led astray by the predilections of the economic thinking in the advanced countries" and to "have the courage to throw away large structures of meaningless, irrelevant and sometimes blatantly inadequate doctrines and theoretical approaches, and to start their thinking afresh from a study of their own needs and problems" [11, p. 101].

On the other hand, if economic theory consists of a formal general principle of allocating scarce resources to alternative uses, the logical implication is that

it is perfectly applicable to economic problems in all societies, regardless of stage of development or historical conditions. The less developed countries are generally characterized by a particularly high degree of scarcity of many resources, and since they cannot afford the slightest waste of these resources, the usefulness of the principle of economic resource allocation is all the more pertinent. Thus, Peter Bauer believes that traditional economic analysis is highly relevant for explaining many phenomena in the developing countries of today and for assessing policy measures. He maintains that "this relevance is not in question, since some of the propositions of economics derive directly from the universal limitation of resources" [2, p. 291]. It may be added, however, that such a defense of economic analysis is often confined to market responses to price change, rather than to total process of growth as a result of the workings of the market-based economy.

Even at the level of argument not formalized to this degree, economists of the neoclassical school generally tend to heavily rely on their theoretical structures for effective solutions to problems in present-day developing countries. The system of general equilibrium analysis has been expanded to comprise a theory of equilibrium growth, supposedly providing an acceptably clear-cut analytical basis to deal with economic development. Specific difficulties on the road to development tend to be more or less minimized. Regarding the effectiveness of economic analysis itself, the distinguishing feature of modern neoclassicism is, as John Knapp points out, that "it is enormously satisfied with, and enthusiastic about, the present state and growth of knowledge in economics" [8, p. 26]. The complacency of the dominant school of economics is somewhat surprising when the economic and social problems of the industrialized countries themselves—distribution, environmental disruption, neglected public services, coexistence of inflation and stagnation—call for urgent theoretical solutions which, however, contemporary economics appears to be in a less than adequate position to offer. Historical experience shows that, whenever thought becomes "orthodoxy" beyond the stage of origination, it is almost invariably concerned with defending its established position, refusing to face change, crisis, and new problems. Thus, orthodoxy insists that all economic problems in the contemporary industrial world can be as effectively resolved by modern economics as the problem of underdevelopment. In the circumstances, the challenge presented by Third World development problems is directed to the core of traditional economic theory. Partial revision of theory will not fully meet the challenge.

II. ECONOMIC ANALYSIS AND POLICY OBJECTIVES

Let us consider what is in store for an economist thoroughly trained in traditional economics who visits a country to help plan development policy. In so far as the technical aspects of his job are concerned, he must first recognize that economic policy here is formulated and implemented within the framework of planning. The *laissez-faire* principle of classic capitalism that management of the economy should be left to autonomous market functions with as little state

interference as possible does not hold today in any of the less developed countries. The main form of Myrdal's "doctrinaire predilections" is thoroughly rejected in policy practice, but distance in this respect from that of the industrialized countries is not as great as the doctrinaire formulation might suggest. Even in the developed market economy it is recognized that an adequate supply of public goods and services and solutions to the questions of distribution and externalities cannot be entrusted to the market. In parallel with the increased importance of economic decisions through nonmarket mechanisms, the idea of planning has been effectively introduced into contemporary "mixed" economies, either in the form of indicative planning, employment acts, or economic stabilization laws. The old maxim of *laissez-faire* has been discredited to such an extent that you can hardly find any liberal policy proposal not explicitly qualified with the differentiation from its *laissez-faire* implications. Traditional economic doctrine, partly reflecting the modified system of contemporary economic management, can therefore easily accommodate the adoption of methods of development planning by the less developed countries.

The logic of planning can best be understood in the frame of theory of economic policy, as developed by Jan Tinbergen for one [21]. Planning in the broadest sense is nothing but a consistently organized system of optimal policies for a given set of objectives. Like every practical problem, the economic policy-making process involves three interrelated elements: aim, situation, and action to be taken. A policy problem can be approached from any of these three depending on how the problem is given. In Tinbergen's scheme, one starts from a given set of economic policy aims, analyzes the situation and the economic structure, and then decides the instruments to be used and action to be taken. The essential link in this process is a system of theoretical reasoning employed in usual economic analysis, in this case, an explicitly specified economic model. The only difference between policy-making and analysis is that the order of reasoning is reversed when the analytical model is used as a policy model.

The traditional economic model describes economic society as an interdependent system of economic variables in which, given exogenously determined data conditions, all endogenous variables are uniquely determined. When there is a change in data or other variables controllable by policy, it is possible to trace the effects of the original change on other endogenous variables to the last causal link through the structure of the model. The model can be used satisfactorily for analytical purposes, provided that all important relations and causal chains are known and built adequately into the model and that parameters expressing intensities of change effects are stable in value. The same model can be used for policy decision purposes, if the order of analytical procedure is reversed, that is, if those variables that appear as results of action are in turn set as policy objectives. Following the reverse procedure, then, the model can explicitly show what changes are required in variables chosen as policy instruments in order to achieve given policy objectives. Once a set of consistent target variables is chosen, the question of economic policy-making reduces to that of finding a set of policy instruments which will realize such objectives to the

maximum extent or at the minimum cost. The only condition usually attached is that the number of instruments should not be less than the number of target variables.

The theory of economic policy obviously constitutes a logically self-contained system capable of meeting technical demands of quantitative economic analysis if sufficient information about data and economic relations is available. It has, in fact, found wide application to the formulation of economic development plans in a number of less developed countries and served well to identify efficient development strategies in varying conditions. It is sometimes even referred to as a new orthodoxy, reflecting its predominant position in contemporary development economics.

Accepting this particular framework of analysis, therefore, we may ask what kinds of pitfalls are usually encountered in the application of traditional theory to present-day development problems. Two problems emerge from the planning procedure. One is related to setting policy objectives and choosing policy instruments in conjunction with objectives. The discussion here is mainly focused on the fundamental orientation or the scope of traditional economic theory. The problems of the other area are concerned with analysis of the economic structure which establishes connecting links between objective variables and instrumental variables. Since analysis requires a model of the economic structure in some sense, either explicitly formulated in quantitative terms or otherwise, the specifications of such a model, that is, the frame and the content of traditional economic theory will be examined later.

A development economist visiting a less developed country is required first to form some idea of the society's development aims. There is usually a consensus among the elite or other articulate group in such a country on which direction of development is desirable for society and what obstacles are likely to be met in the process. However, these aims and difficulties are often perceived only in extremely vague form. What is the task for the economist in these circumstances? The importance of examining policy objectives derives from the fact that, unless these objectives correctly reflect social preferences, there would be no justification for a development policy formulated with these objectives in view. But, the usual economic model does not contain mechanisms to ensure a set of optimal targets, nor can criterion for judging target choice be derived from it. More specifically, the acceptance of vague aspirations of local society as a substitute for precisely defined targets in quantitative terms deprives modern economic analysis of the chance to make its own specific contribution.

Modern economic science is inclined to regard the setting of policy objectives as something lying outside its purview. In the "positivist" tradition of modern science, policy objectives are assumed as given from outside the economic model, through the political process. An economist is advised simply to accept them, for to examine or even criticize them is beyond his competence. The modesty of an economist is perhaps logically consistent and will make sense if the visiting economist refrains consistently from value judgments on economic policy. But, as soon as his advice on development policy is sought, the economist can hardly

escape the duty of judging the adequacy of given policy objectives.

The reason is that setting policy objectives is intrinsically related to the task of economic analysis and examination of policy instruments which is obviously within the purview of economics. There is, first of all, a question of the structure of objective functions. Individual aims and targets are interrelated with each other in characteristic ways: there may be a mutually reinforcing relationship in the sense that the achievement of one target facilitates the realization of others, or a trade-off relationship in that one objective can be pursued only at the expense of others. It is necessary to establish an order of priorities among competing objectives according to strategic importance as well as to identify effective combinations of complementary objectives, but this is precisely the task which falls squarely on the shoulders of the economic analyst engaged in elucidating interrelationships of economic variables. As economic development takes place, moreover, the manner in which individual objectives are interrelated will also change. This means that in the process of development plan implementation, the original decision on objectives has to be continually reexamined and reformulated.

Second, adequacy of chosen objectives cannot help but be affected by the choice of policy instruments, a decision within the domain of the economic analyst. Thus, while the economist is engaged in multidimensional assessment of the effects of policy measures set for adoption, he is forced to reexamine the government's targets and reassess the relative weights of individual objectives in sharper outline than previously. Since analysis of policy effects helps to clarify possible side-effects not visible before, the economist can not be allowed to totally shirk an examination of the combined set of objectives, if he is to select the optimal set of policy instruments within a logically consistent model. The "modest" economist would either have to give up this essential analytical task or try to say something pertinent about policy objectives by sneaking value judgment, so to speak, through the back door.

This inescapable dilemma suggests the need to make value premises explicit in any "positive" social research. By so doing, our visiting economist would allow his own value criteria to be "tested for relevance, significance, feasibility and logical consistency" (Gunnar Myrdal's "Response to Introduction" in [1, p. 457]) from the point of view of the less developed country concerned, thus avoiding hidden biases.¹ Development is a highly value-loaded concept, and the choice of policy instruments, a proper task of the economic analyst, cannot be entirely free from valuation. As long as the prevailing view tends to minimize the contributions which economic analysis makes for choice of objective func-

¹ This position can be defended precisely by the empiricist spirit of modern "positivist" science. It is the logical basis of Gunnar Myrdal's "praktische Nationalökonomie" which establishes itself as an objective science through "positive" testing of the value premises explicitly introduced and "positive" reconstruction of policy postulates [10]. This explains the scrupulous care with which Myrdal had to introduce what he calls "modernization ideals" as an analytical value premise into his monumental study of the development drama of Asia [12, Vol. 1, Chap. 2].

tions, the relevance of development economics as a planning theory will remain very limited. It cannot cope in a meaningful way with the principal problem of economic policy, i.e., the problem of consistency between objectives and policy instruments.

On the other hand, the vistas of development economics must be greatly expanded beyond the realm of traditional economics. Economic development is clearly a complex process that comprises not only so-called economic factors, but a broad array of powerful elements of social and institutional nature as well. Specifically, when a "crisis in planning" at the end of the 1960s led to a thorough examination of previous planning, criticism was directed at the narrow concentration on "economic" aims, particularly the objective of quantitative economic growth as shown by GNP indicators. The predominant argument was in favor of extending the planner's objective functions to a broad social area, including the problem of poverty, equality of opportunity such as in employment, and income and wealth distribution. In view of past failures to effectively mobilize broad masses of people for development, planners became aware that the attainment of social objectives in itself may play an important role as a mechanism for social incentives and thus become, as it were, one of the essential instruments of development policy.

One basic premise in traditional model-building is that an unambiguous distinction can be made between data variables and endogenous variables. Data conditions are usually identified with "noneconomic" elements; an economic model is often structured in such a way that only "economic" factors can be directly explained within the system. The essential point in economic development is, however, that considerable change in social and institutional factors is involved in the development process so that neither the setting of objectives nor the selection of policy instruments can adequately be dealt with, without taking into full account changes in variables that are treated as exogenous in the model. If effective development analysis and policy are to be derived from traditional theory, the first requirement will be to try to incorporate as endogenous dependent variables into the model as many variables as possible that are treated as exogenous data in the traditional economic model. This is not an entirely new point of view in contemporary discussion of development economics.

It is true, of course, that customary model-building has a dividing line between data and endogenous variables not rigidly drawn once and for all. Where such a line is drawn depends on the purpose of the analysis. Once a clear distinction between the two groups of variables has been made, however, static equilibrium analysis presupposes that the dividing line not be redrawn while analysis is under way. For a given analytical problem, the data conditions are, by definition given, assumed to remain constant. If they change, the meaning of equilibrium analysis itself is in question. Now, this is exactly what happens in the economic development process. It is the prevailing understanding of dynamics that its essence simply consists of the introduction of time sequences into analysis, but it seems of greater significance to the nature of dynamics that, even if endogenous variables converge at a certain equilibrium value with a lapse of time,

these changes themselves will cause data conditions to change significantly. The essential problem of dynamics exists precisely in the circumstances that changes in endogenous variables necessarily affect given data and the continual changes in data conditions induce in turn significant changes in endogenous variables and their mutual interrelationships. In the process of dynamic development, therefore, the logical basis of equilibrium analysis itself is undermined.

In another important respect, the actual process of economic development raises serious questions about the framework of Tinbergen's policy analysis. His policy model is predicated upon the assumption that policy objectives and instruments are mutually independent. Only when they are independent of each other, does it become possible to first set up a set of objective functions and then, quite independently, select a set of instrumental variables consistent with given objectives.

In the actual process of development, however, it often happens that what is conceived of as a target variable is not only an objective of independent value, but has in itself significant value as an important policy instrument. Reference has been made to the case that the pursuit of certain social objectives may be a powerful instrument for mass mobilization. If we confine our discussion to factors of economic implication, we may mention income growth that is usually taken as an important policy aim. Income growth leads to an increase in consumption, but in the conditions prevailing in less developed countries it does not only satisfy the current consumption demand, but may prove to be an important means of raising labor productivity through strengthening ability and willingness of the laborer to work.

Conversely, the choice and use of policy instruments may affect the definition of policy objectives themselves. While attempt is made to realize intermediate targets at a given time, further ultimate targets may be defined more clearly than before, or entirely new objectives may appear on the policy maker's horizon. In some cases instruments are used not for predetermined objectives, but rather to search for some new worthwhile aim for development efforts. As development progresses through the actual use of policy instruments, society may become aware of new development aims not previously within its value system. When new demands are generated, the process creates new opportunities for development.²

Thus, on the one hand, what were thought to be aims perform unexpected functions as instruments and, on the other, new values and new aims are created from the use of what was merely conceived of as means. The development process involving social change may, after all, be properly described as a process in which means and ends always change position. In that process the relevant parameters of the system will also change in value, and as the scale of value shifts, policy emphasis and direction of effort will have to be continually modified.

² That the development process is characterized by "the multiplicity and creative disorder of the human adventure," rather than by a linear approach to the optimal solution in an end-means model is emphasized by Albert O. Hirschman. See, among others, [6, p. 27].

To do justice to the working of this type of cumulative causation, it seems that fundamental reformulation is necessary of traditional economic theory based on general equilibrium system and an end-means models.

III. REALISM AND RELEVANCE OF THEORY

If we want to analyze the effects of a given policy, we must, first of all, clearly understand how the economy in question is structured and how it functions. Knowledge of mere facts is not sufficient. We must know how a variety of socio-economic factors relevant to the problem at hand are interrelated—the totality of these interrelationships is termed “structure,” and the path of change in each factor as a consequence of the policy must be systematically pursued. Among relevant factors, some are included in data exogenously given beyond policy control, and others may be determined by policy, still other variables are endogenously shaped through the internal mechanism of the system. If we are interested in specific economic phenomena like production and consumption, for instance, all factors relevant to these phenomena are brought together into structural or behavioral relationships of some kind, that is, into production functions or consumption functions. Forms and intensities of mutual relations among relevant factors are specified in detail on the basis of past data or qualitative knowledge. Roughly, this is the usual procedure of building an economic model. Even if the relevant relationships are not specified explicitly in quantitative terms, the minimum requirement for economic analysis worthy of the name is to have an image or conception of the structure and function of the social economy in question, the essence of an economic model in the broad sense.

The function of economic theory is to put building blocks of an economic model together and to specify the characteristics of the model. At the present stage, when a theoretical system of development economics has not yet been fully established, economists dealing with development in less developed countries, in the absence of fully adequate tools, would consciously or unconsciously tend to use the framework of traditional theory for building models—a task that has to be performed for the analytical purposes. To ask how useful a theory is for development analysis is to ask the relevance of the economic model derived from theory to developmental reality.

Like all modern positivistic science, economics is a system of hypotheses derived from certain assumptions. We need hypotheses if we want to abstract the crucial elements from the complex mass of detailed circumstances surrounding the economic phenomena needing explanation. They are organized in a specific manner in a “filing system” (Milton Friedman), in order to make empirical materials easily understandable in a consistent way. While it is the function of a hypothesis to “explain” past events and to “predict” consequences of action, change, or developments in progress, its validity or usefulness in analyzing given problems can be confirmed by testing it in the light of actual events.

The problem of relevance of economic theory may then be approached from two aspects: to put it conveniently, the aspect of realism of the assumptions and

concepts (categories) used in constructing hypotheses, on the one hand, and the aspect of relevance or adequacy of hypotheses themselves or the models to reality, on the other. An approach under separate headings may help to facilitate the exposition, though in the nature of things these two aspects are closely and often inseparably interrelated in given problem situations.

If we raise the question of realism of assumptions and concepts in economic theory, we must carefully qualify the meaning of realism in one important respect. A theory or a hypothesis is a product of abstraction, as it must be in its very nature if the crucial factors are to be abstracted from the complex facts of reality. It is precisely because of the lack of full realism that a hypothesis can have the power to "explain" or "predict" concrete events or consequences. A hypothesis itself cannot, therefore, be descriptively realistic. A "realistic" theory describing each detail of reality is a contradiction, as evidenced by the fact that some followers of the historical school reached a position tantamount to the rejection of theory itself. Obviously, it does not make sense to speak of realism of a hypothesis in the descriptive sense.

Certain assumptions must be adopted, however, if crucial relations are to be derived, and certain concepts must be used for defining these relations. Realism of assumptions and concepts is often a matter of semantics. Milton Friedman, for example, denies realism of assumptions. To the extent that empirical evidence plays a vital role in constructing hypotheses, however, the assumptions adopted that "are sufficiently good approximation for the purpose in hand" [5, p. 15] must be assumed to conform to reality if they are to serve to isolate important substantive relations in the real world. The assumptions selected depend on how the hypothesis is used; they are directly related to "defining the class of phenomena for which the model can be taken to be an adequate representation of the real world" [5, p. 24]. Friedman also admits that the concepts or categories used must have "a meaningful empirical counterpart" if a theoretical model is to stand the test in reference to reality, in order to be "useful in analyzing a particular class of concrete problems" [5, p. 7].

In modern economic tradition strict criteria have been applied to rigorous logic, but it appears, as Myrdal pointed out, that sufficient care has not been given to "assumptions and concepts implied which too often are neither consistent nor adequate to reality" (Myrdal in [1, p. 459]). This bias is not confined to development problems in the Third World; it is not unrelated to the fact that increasing mistrust and criticism are directed at the way that economics deals with contemporary problems in modern industrialized society as well. But, a critical review of the reality of theoretical assumptions and concepts takes on particular importance when traditional economics is applied to the problems of less developed countries embarking upon the development process under conditions totally different from countries with highly developed market economies.

Here is a typical case of the difficulties of transplanting models based on assumptions that conform to a set of conditions to situations in which entirely different conditions prevail. The mistake of transference is encouraged by most texts which fail to make the assumptions of economic theory explicit and tend

to give the impression that theory is perfectly applicable without modification to economies of any nature and any stage of development. The mechanism of economic growth, for example, is usually formulated within the framework of capital goods production taking place inside the national economy. It is easy to see that the growth mechanism has a fundamentally different form when facilities to produce capital goods do not exist in the country. A conclusion may be derived under the assumption of elastic supply of goods, but it will not hold if the same model is applied to a situation in which supply is inelastic.

The content of categories defining crucial economic variables may be meaningful in a given situation, but becomes nearly meaningless when transplanted to another situation. Take, for instance, the concept of employment. "Involuntary unemployment" denotes a situation in which jobs are not available to workers willing to work with information and ability to find jobs whenever offered. However, the main question in many less developed countries is that the labor force is not utilized where the habit of working as hired labor is not universal. In the absence of such institutions as labor exchange, information on job opportunities is scarce. Western categories of employment and unemployment are hardly appropriate here. The term disguised unemployment is often used to describe the typical conditions of labor utilization in rural areas of these countries, but it should be noted that the term was first used by Joan Robinson to characterize low-productivity recession employment in industrialized countries. The problem of non-employment in less developed countries where human resources are structurally and permanently underutilized is of a different nature.³ The non-utilization of labor force is neither due to lack of effective demand nor to deficiency in complementary means of production required for the creation of employment opportunities. If we continue to neglect such social-institutional or social-psychological factors of attitude and aptitude as constraint of caste, religious restrictions against female labor, lack of disciplined work habits, lack of the ability to learn techniques and apply them—in short, all social variables left outside traditional economic models, it is almost hopeless to approach the problem of employment, or more correctly of labor utilization in developing countries. A typical mistake of transferring economic models to entirely different conditions is to underestimate these qualitative factors posited as given constraints in usual short-term analyses [16, p. 329].

In respect to macroeconomic aggregate concepts as well, the transference of economic models involves some problems that should be considered carefully. This means a case of "misplaced aggregation," as Paul Streeten calls it [19, pp. 60–62]. The assumption of traditional economics is that future production is mainly increased by investment which is matched by savings, whereas consumption has no function in increasing input into the production process. In the conditions of the less developed countries, however, the increase in consumption involving an increased calorie intake and an improved standard of health in-

³ See "A Critical Appraisal of the Concept and Theory of Under-Employment" [12, Vol. 3, Appendix 6, especially p. 2043], and also [9, p. 152].

creases the ability of laborers to work and contributes to raising labor inputs as well as labor productivity. Increased consumption, while satisfying current "consumption" demand, also has the function of "investment" in the sense of raising output. Viewed as a planning problem, also, we have to reckon with the possibility that increased production of consumer goods provides the basis for additional labor utilization—a situation to which the nearly forgotten classical concept of "wage fund" will be more appropriate than the modern concept of multiplier. It should be obvious that the dominant conceptual framework in which consumption and investment are defined as mutually exclusive is not equally meaningful and relevant in different societies.

Moreover, the usual aggregative concept of "savings" as income minus consumption may not be as useful under the general conditions of the less developed countries as it is for the analysis of growth and business cycles in the industrialized countries. Where transformation of resources is subject to structural hindances, there are quite important differences between savings realized in the form of foreign exchange and those generated through reduction of domestic consumption.⁴ In a society with less developed intermediary functions of financial markets, domestic savings have substantially different economic effects, depending upon the sources from which they originate. As subjects and sources of savings differ, so does investment differ greatly in magnitude and forms. A macro-economic theory adequate to the conditions of the industrially developed countries, where domestic resources can be smoothly transformed into exports and the intermediary functions of finance are highly developed, would require careful modification if applied to essentially different conditions in less developed countries.

At this stage, the question shifts from the level of realism of assumptions and concepts to the question of relevance of theory to the problems analyzed and to circumstances explained. We have seen that realism of assumption and concepts must be viewed in relation to a particular analytical purpose which the model serves. The assumptions to be adopted and categories to be chosen depend upon how the problem is posed. But, when we raise the question of relevance of a theoretical model to reality, the discussion will not be limited to the assumption used for logical abstraction and the concepts and categories selected, but will have to examine also the logical consistency of the model and the structure of the theory itself, including a particular form of interrelationship among variables contained in the model.

In the past, the major criticism of traditional economic theory by development economists has not been directed at the level of theory itself. The critics' attention has concentrated on appraisal of the market mechanism underlying the basic assumptions of the theory, leading in most part to the explicit rejection of *laissez-faire*, the policy implication of the theory. This is understandable, because testing a theoretical model against empirical facts necessarily involves an ap-

⁴ These differences have led to the hypothesis of "dual gap," that is, of the independent existence of foreign exchange gap and domestic resource gap. See, in particular, [4].

praisal of it on the policy dimension, that is to say, an examination of its policy implications in the light of actual development. We may agree that the core of traditional economic theory, centering on the market mechanism, consists of a statement of static optimization on the basis of equilibrium in the market. Its basic policy implication is laissez-faire. Now, we must admit, the prevailing situation in less developed countries leaves considerable doubt of the function of the market mechanism to achieve optimum equilibrium. This is not to deny the effectiveness of the market in the sense of market responsiveness to price change. Even if the market works effectively in its own sphere, however, the market mechanism may fail to produce desirable results, either in terms of growth rate or in terms of social distribution pattern. The effectiveness of the market would then justify the use of price mechanism as a means of planning within a framework of social decision-making.

The importance of this approach in its underlying assumptions of market equilibrium does not preclude the desirability of another approach, namely to call the structure of the theory itself into question. What follows is an attempt to make the structure of traditional economic theory, as exemplified by one of its important constituents, explicit and ask whether it is relevant to real problems, while avoiding the issues of value judgment implicit in the assumptions. The partial theory chosen for examination is that of variable factor proportions in the production process.

When the simplified theory of factor proportions in two factors, capital and labor, is applied to the conditions in the less developed countries, in which labor is relatively abundant and capital relatively scarce, it follows that productivity of labor is relatively low and that of capital relatively high. This conclusion results from the law of diminishing returns, assuming substitutability among the factors of production. Theory says that the relative prices of factors are equal in equilibrium to the marginal products of respective factors. It is, then, economical in this type of economy to use as much labor as possible and to save capital to the greatest possible extent. It necessarily follows that the industrializing countries should opt for labor-intensive directions rather than capital-intensive ones, in respect to both choices of production branches to be encouraged and choices of production techniques to be made within given lines of production. In this policy recommendation, in fact, there is a remarkable degree of agreement, close to unanimity, among Western economists using traditional theory.⁵

In the practice of industrialization in many developing countries today, however, this principle is often honored with breach, rather than with observance. Indeed, the fact that the principle tends to be entirely ignored in the practice would suggest several kinds of difficulties encountered in application of the underlying theory of marginal product to actual conditions. We may refer, first of all, to the basic logical difficulty of the theory that its static nature precludes adequate consideration of the dynamics of production, while concentrating on

⁵ An outstanding exception is Nicholas Kaldor.

the variable combination of labor and capital under strictly static assumptions. The only concern of the theory is with substitution between factors of production along given isoquant lines within the static framework of output constancy.

In the theoretical scheme in question, of course, it is possible to speak of output as an objective function to be maximized. If the aim is to obtain the maximum quantity of output with a given amount of capital under the condition of labor surplus, the technique to be chosen is the one which will make the output-capital ratio greatest. This follows tautologically on simplifying assumptions. One should adopt "capital-saving" techniques, that is, those which require as little capital as possible per unit of output, and the amount of labor combined with capital is entirely irrelevant. However, "capital-saving" techniques so defined are not necessarily "labor-intensive" in the sense of a low capital-labor ratio (W. B. Reddaway [13, p. 72]). Conversely, "labor-intensive" techniques, recommended by the theory which concentrates on substitution between labor and capital, may not be efficient in achieving maximum output per unit of the scarce factor, capital, but may lead to a considerable waste of capital.

There are certainly cases in many production processes in which relatively labor-intensive methods can also save capital required per unit of output. But, labor-intensive techniques, implying low capital-labor ratios, are not always most efficient in the sense of low capital-output ratios. The Ambar Charkha, for instance, designed to solve employment problems in India and adopted into the Second Five-Year Plan, is a case in point. This hand-operated spinning machine had such low productivity that "far from creating any flow of surplus, it produced a flow of output value less than even its recurrent costs" (A. K. Sen [18, Appendix D, p. 119]). Even under the most favorable conditions, the laborers' income would have to be supported almost entirely by government subsidy, and the adoption of labor-intensive techniques would result in a waste of capital, not a saving of it.

Apart from neglecting the dynamic dimension of output, the common weakness of factor proportion theory can be traced to the assumption that capital is a homogeneous entity. If capital were perfectly homogeneous, one could assume that output would be greater with a technique combining more laborers with a given value of capital than with a technique which couples a smaller number of laborers with capital of the same value. However, this relationship does not hold if the choice is between hand tools and machines which have the same value. It is obvious that relative wage levels have to be taken into consideration in the decisions that private industry makes on production technique. Provided that the same money wages are paid regardless of techniques chosen, labor-intensive methods of production would not be selected unless a greater volume of output per unit of capital is assured thereby. Depending on cost conditions surrounding the production process, labor-intensive techniques may not be selected for adoption, even with higher output-capital ratios.

The choice between production and employment goals is today a hot controversy in the development strategy of many less developed countries. The fact that the choice is a real problem is an eloquent proof of the bankruptcy of

traditional variable factor proportions theory, because theory should not allow the possibility that the two policy goals are mutually irreconcilable. If the objective is to maximize employment, one would like to see techniques adopted which use as many laborers as possible per unit of the scarce factor, capital. There would be no special problem if these labor-intensive techniques simultaneously achieve the goal of output maximization through raising output-capital ratios. This is precisely what the theory implies. However, there is no logical assurance that a greater number of laborers working with hand tools produce greater output than fewer laborers operating machines with the same value as hand tools. In many cases, the adoption of labor-intensive hand tools would lower output-capital ratios and fail to maximize output. By contrast, if output is maximized through higher output-capital ratios, techniques involving higher capital-labor ratio will have to be selected; the goal of employment maximization will remain unfulfilled. It cannot be denied that policy makers in many less developed countries are actually confronted with such a trade-off relationship between the goal of output maximization and the goal of employment maximization.

There is no room for such a conflict between the output and employment objectives in the static theory of factor proportions. In the theoretical framework in question, the combination of capital and labor is continuously variable along given isoquants which denote given levels of output: any amount of labor can be coupled with any amount of capital. In this model, the limit of employment is given by the level of real wages demanded by laborers. What is required for achieving maximum employment is simply that the relative factor prices change elastically: since the wage level relative to the rental price of capital determines the size of employment compatible with a given output level, full employment is always assured if the relative wage level can be lowered sufficiently. But, as any amount of labor can be combined with any amount of capital, the price line expressing relative wage level can be tangent, graphically speaking, to the highest isoquant reached with a given amount of capital. Given the conditions of factor endowment, at that point maximum employment and maximum output are realized simultaneously. There cannot be any conflict between the employment and output goals.

If the wage level is not infinitely elastic, however, and if the level of employment combined with specific capital equipment (the assumption of homogeneity of capital is abandoned) is not independent of a given wage level, what Joan Robinson terms "pseudo-production function" breaks down. In many production processes, the possibility of substituting labor for capital (or machines) is technically limited. In a graphical presentation, this means that discontinuities and kinks of production function must be considered. In practice, complementarity between factors of production or within each factor of production assumes considerable importance. Let us consider, for example, the introduction of some capital equipment into a less developed country. Laborers will improve their skills just by learning how to use the equipment, and consequently output will increase. Contrary to what the theory implies, the introduction of capital-

intensive equipment will not only raise the output-labor ratio, but also the ratio of output to capital. We would conclude in this case that the assumption of constancy of labor skills is not in conformity with reality. Or, we would argue that the theoretical structure which leaves out changes in data conditions taking place with the passage of time is called into question. The problem of realism of assumptions shifts unnoticed to a question of the relevance of the theoretical model itself.

Economists have often overlooked the fact that individual investments are highly complementary. The significant point is that the factor of production called capital has in itself a specific internal structure, and the lack of capital structure analysis is perhaps one reason for peculiar difficulties in traditional capital theory. Now, just because of complementarity, the efficiency of one class of investment depends to a high degree upon the magnitude or quality of capital already invested. So long as we stick to the traditional concept of capital, we are obviously faced with a case of increasing returns. Contrary to what the theory of factor proportions suggests, it is commonly observed that in capital-scarce less developed countries capital does not necessarily have high productivity nor is it necessarily used with great efficiency.

Viewed in the perspective of actual policy decisions, the choice of techniques is not a simple technical problem of selecting "efficient" methods of production under static assumptions. It is rather "a genuine socio-economic choice" to be decided on in the broader context of social, institutional, and human factors (A. K. Sen [18, Appendix C, p. 114]). From this point of view, the limitations of traditional theory become clearer. To the extent that labor productivity is a function of the amount of capital used in the production process, the insistence on labor-intensive methods would mean continued low-productivity employment and have socially undesirable influences. In the dynamic context, the choice of technique also affects the rate of reinvestment from a given investment, or the rate of capital accumulation through a particular pattern of income distribution implied in the choice. As low productivity of labor means a small surplus over per capita consumption, industrialization in the labor-intensive direction may not have sufficient power to promote long-term economic development. By contrast, capital-intensive development may, while initial employment effects are limited, achieve, within a relatively short time, a higher level of employment than labor-intensive low-productivity growth path promises. It is perhaps no accident that development policy actually adopted in many developing countries seems to point in directions hardly compatible with the implications of traditional theory. Here, too, reality is a testing ground for the relevance of theory.

The theory of factor proportions takes the form of the well-known Heckscher-Ohlin theorem when applied to the problems of international trade. It is interesting that repeated attempts to test the factor proportion hypothesis against actual trade data have in fact led to the discovery of many more paradoxes, in addition to the Leontief paradox. The analysis of India's import and export structure in its bilateral relations with the United States was particularly significant for economic policy in the less developed countries. The exports from

India, a typically labor-surplus country, to the capital-rich United States consisted of relatively capital-intensive goods, while India tended to import labor-intensive products from the United States (R. Bharadwaj [3]). The factor proportion hypothesis would have suggested precisely the opposite outcome and it must be rejected.

Paradoxes emerge also from Takuo Tanaka's analysis of Taiwan and Korean exports [20]. True, labor-abundant less developed countries generally tend to have comparative advantage in low-wage, labor-intensive industries. But Tanaka found that, at a certain stage of development, export expansion from these countries tends to be led by capital-intensive and high-productivity industries, or by industries with higher rates of increase in labor productivity, even in the absence of change in relative factor endowment. One way of interpreting these facts that refute the theoretical hypothesis may be that the relative wage level is actually fixed by historical circumstance and in turn determines the actual proportion in which labor and capital is combined in the production process. Experience in Taiwan indicates that the higher the degree of capital intensity or level of labor productivity in industry, the more successful the industry is in export in terms of the rate of increase. More distinctly, industries with higher rates of increase in capital-labor ratio, productivity and wages are favored with higher rates of export growth. If we isolate bilateral trade between Taiwan and Japan, Taiwanese industries with relatively higher capital-labor ratios compared to their Japanese equivalents are more intensively specialized in exports. Capital intensity and export share are also closely correlated in export competition between Taiwan and Korea in the world market. The "Taiwan paradox," as Tanaka calls it, is certainly paradoxical in the light of the static theory of factor proportions; it raises serious questions on the relevance of the theoretical model to the export strategy in less developed countries.

IV. IN THE PERSPECTIVE OF HISTORY OF ECONOMIC DOCTRINES

The analysis of the development problems in less developed countries is in an infant stage; we do not yet have a system of development economics worthy of the name. Keynes once expressed the view that the actions of practical men are often a mere reflection of what academic scribblers said some time before. The interaction of ideas and practices is complex, indeed, and Keynes's dictum may be interpreted as implying that practical economic problems usually have to be solved without the support of adequate theories. Given the necessary time gap for building doctrines, a theory in the field of development economics may only be starting to catch up and formalize the successes and failures of development efforts in the postwar quarter of a century. A more straight-forward interpretation of Keynes's dictum points to the overwhelming power of ideas inherited from the past, which invariably tend to guide practical action in certain ways. For us, the old ideas restricting our horizon are the traditional static equilibrium economics. If one day a full-fledged system of development economics is to be formed, it may be absolutely necessary to start with a reappraisal of traditional

economic theory in the light of development experience. The present paper is part of such an exercise.

Meanwhile, it is not merely in the problem areas of economic development that the relevance of economic theory is questioned. An increasing number of problems in contemporary society, including that of the industrially developed countries, presses economics for adequate answers. To mention a few: harmony between economic growth and social objectives; the coexistence of world-wide inflation and economic stagnation which seems to be beyond the control of traditional policy means; the problem of poverty and justice in distribution, even in affluent societies; challenges of public economics, involving questions of social control and freedom; the need to prevent environmental disruption and preserve the quality of life; the question of economic and technological adjustment on limited resources and food supply; and the problems of international adjustment and harmonization of national policies in a changing world economy. But, an honest examination of the situation admittedly shows that traditional economics has so far offered few effective solutions for any of these problems. Thus, we hear much of the "crisis of economic theory" and a great deal of self-reflection going on about the fundamental position of economic science.⁶ The question of relevance and applicability of economic theory to development problems is not entirely unrelated to the general reappraisal of orthodox static equilibrium theory in the contemporary context. The challenge of development economics as we see it must be directed to the whole of traditional economics itself.

To question the relevance of traditional theory is only the first step in the required critical appraisal; it does not even suggest any positive content for critical work. But, a glance at the history of economic doctrine justifies the proper place for a limited critical study. Several "revolutions" in economic thought were preceded by isolated voices of heretics some considerable time before their challenges were met. A few sensitive economists perceived that the prevailing doctrine was not adequate to cope with some problems urgent to society. Their interpretation of actual events differed from the accepted position, leading them to question the relevance of orthodox theory. The new interpretation of the critics should develop in time into a new system of thought with different policy implications. In view of the immaturity of ideas and conditions, however, the voices of the critics would not be recognized within the academic main stream at this stage and remain buried in the academic "underworld."

If we look back to the line of ideational developments leading to the "Keynesian revolution," we find one such precursor in J. A. Hobson whose heretical ideas were not accepted by the leading British universities in the last two decades of the nineteenth century. At that time Hobson clearly recognized that danger of "over-saving," a possibility denied by the orthodox school for some time. In

⁶ The 1971 annual meeting of the American Economic Association championed two powerful statements of self-reflection: Joan Robinson's lecture on "The Second Crisis of Economic Theory" and Gunnar Myrdal's criticism of establishment economics. Both are published in [1].

retrospect, however, we see today the birth of an idea which led to a fundamental reconstruction of economic theory after almost half a century. If indications today point to "a major revolution in doctrine looming ahead," are we not justified, as Dudley Seers suggests, in speaking of a "Hobson phase" of development economics now in the process of formation, which will see its final form some time in the future [17, pp. 2-3]? Seen in this perspective, a critical examination of orthodox theory may not be entirely out of place.

Keynes's own evaluation of the precursory work of heretics is still highly suggestive. Those "who, following their intuitions, have preferred to see the truth obscurely and imperfectly rather than to maintain error, reached indeed with clearness and consistency and by easy logic but on hypotheses inappropriate to the facts" [7, p. 371]. The heretic critics, in search of "truth," rejected the "error" of orthodox theory based "on hypotheses inappropriate to the facts." But the truth, perceived only "obscurely and imperfectly" at the time, could not displace the prevailing scheme of thought, for it takes a consistent theoretical model to overcome a theoretical model. An attack on inadequacy and irrelevance of hypotheses is not enough to reconstruct economic theory. But, the history of economics seems to suggest that a doctrine with the distinguishing advantage of logical "clearness and consistency" may not survive very long, if its hypotheses are "inappropriate to the facts." In this sense, the discussion of the relevance of a theory to reality may have a claim on a proper place in the life cycle of economic theory. It is, after all, through phases of such a life cycle that economic science progresses step by step.

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