CHAPTER 1
This study is an attempt towards analysing the economic factors involved in the generation of skilled manpower in a country. Skill in this context is understood as knowledge and training that is directly representable in terms of enhanced productivity of the "skilled" and hence as ensuring higher earnings in the labour market.

The existing literature on the economics of skill formation has grown largely along two distinct themes. One is the theme of individual decisions - mostly investment decisions - involved in the process of skill formation. The other is the theme of measurability and addibility of human capital - either in terms of stocks and flows of the skill formed, or in terms of the returns on the investment made.

While the first theme has provided us with many useful studies on the issue of skill formation, it tends to draw a one-sided picture, looking at the question mainly from the standpoint of the individual decision-makers which is only a partial way of looking at what is basically a societal question. The

1 One would find this theme spread over a large body of the literature in economics of education. To mention only a few of the well-known studies, one may refer to Sheshinski (1966), Ben-Porath (1967), Weiss (1971), Haley (1973), Parsons (1974), Levhari and Weiss (1974), and Lazear (1977).

2 Harbison and Myers (1964) tried to construct a simple and direct quantitative indicator of skill formation. Apart from this, many conceptual and empirical studies aim towards evolving and testing precise quantification techniques in education. See, for discussions, Anderson and Bowman (1966), Bowman (1962, 1968), and Psacharopoulos (1973).
second theme, on the other hand has proved to be largely
infructuous both because the societal purpose has not been
clear and because the operational usefulness of pursuing the
theme has not been unambiguously established. The existing
studies, as a result, do not seem to present a sufficiently
clear or complete account of the factors determining invest-
ments in skill formation in an economy. 3

The pursuit of the notion of the complementarity of
two domains of investment in education—of the individuals
and of the institutions—it is visualized, would provide a
new dimension to the analytical framework of the discussion in
this area. 4 It is emphasized in course of this study that both
the individual investment decisions for procuring education,
and the institutional investment decisions for providing
education are, in their separate but mutually complementary
ways, crucial to the determination of the process of skill
formation. Assuming that this two-part analysis provides a
sounder basis for taking a total view of educational investmen-

3 We shall not, here, go into a critique of the existing
studies. Existing literature itself provides adequate
material on their assessment. See, e.g., Sen (1966a).
For a recent social choice-theoretic critique of the
existing rate-of-return approaches, see Majumdar (1963,
chapter 3). For general readings on measurement, see
Correa and Tinbergen (1962), Denison (1962, 1964),
Griliches (1970), and Bowles (1967) as related to
education and skills; and Robinson (1954), Solow (1957,
1960), Stigler (1961), Ruggles and Ruggles (1961),
Griliches (1963), Jorgenson and Griliches (1967),
Hicks (1968), and Barna (1968) as related to productivity
and capital.

4 See Majumdar (1963).
our concern, in this study, is to analyse how investments in skill formation are determined. Here we propose separate treatments of three institutional agencies: the non-profit school, the profit-making private educational institution, and the firm providing on-the-job training for its own purpose.

We have defined the market for education in terms of these three institutional agents or agencies on the supply side and the individuals seeking training on the demand side. We postulate that skill formation in an economy is determined by interactions between the education market on the one hand and the three normal markets of labour, commodities, and capital comprising the 'rest of the economy', on the other. In this general framework, it will be our concern first to understand how the education market in itself operates in relation to each of the three institutional agencies of skill formation with the existence of the economy assumed in the background. We shall also try to see how the rest of the economy bears upon the investment decisions of the institutional and individual agents in the education market.

Drawing upon the analytical framework so derived we also intend to see what insight it provides in analysing some well-known historical facts about education and skill formation. Presenting some historical material to highlight

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5 The decision making agent in case of the non-profit school could be and usually is the state or a governing philanthropic body which makes the "societal" decisions on investment in education.
the transition towards institutionalisation of skill formation over time, we, therefore, venture to put forward some conjectures about the nature of the underlying factors. This exposition will be in consideration of the fact that the purpose and curriculae of formal school education in the earlier times were not directly related to the formation of what we today understand by skills. Schooling in most periods has been often conservative, religion-oriented, or elitist, and skill formation as such has taken place mostly outside the formal set-up of education. It is only recently and gradually over time that schooling has actually acquired an important direct role in skill formation. But this role, we shall suggest further, has not been a sustained one even through the modern age. Perhaps because of the declining educational standards in schools and universities there is a modern revival of the non-formal (and semi-formal) systems of training in the firms and in the private training institutes.

Skill formation, we would suggest, could be seen as having passed through five broadly classified phases which we have called (1) the apprenticeship-in-crafts phase, (2) the apprenticeship-in-firms phase, (3) the training-through-institutes phase, (4) the skill-formation-through-schooling phase, and (5) the declining-school (or the revival of non-formal training) phase, respectively. Leaving aside the first which basically characterises a pre-industrial phase, the next three phases, however, could logically, replace each
other in a circular sequence - signs of which we seem to get
confirmed in the historical material. Logically again the
fifth (or the most modern) phase seems to be a natural conse-
quence of all this.

Introduction of new commodities as well as changes in
existing production functions caused by the dynamics of
technological progress change the nature of skills required
and with them the method of skill formation itself. We shall
try to substantiate this proposition by recalling some
evidence from the history of the industrial revolution. But
basically and quite apart from this necessarily casual reference
to history, we shall put forward here a logical premise. We
shall argue that the transformation in the process of skill
formation should be facilitated by the working out of what we
shall call the advantages accruing to the employer through
the "exploitation of market possibilities".

An exploitation of the employee may be inherent in
a fall in the wages of skilled labour over time because of
the growth in the number of skilled personnel. Due to the
institutionalisation of training there arose the opportunity
for the employer of effecting corresponding reductions in
labour (skilled) costs. However, these opportunities dwindled,
we suggested, because of the falling educational standards of

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6 We follow up this conjecture by referring to a number of
historical instances that otherwise might appear too
random or capricious. Our purpose here would be to try
to indicate the possible scope and usefulness of
generating a particular kind of data and of undertaking
systematic empirical research in the given framework.
the larger numbers. The contemporary trend towards deinstitutionalisation of skill formation and revival of non-formal systems of training could be a reaction to the rise in "effective" labour-costs due to the falling educational standards and consequent decline in labour efficiency.

Having analysed the factors determining skill formation, we shall extend the theoretical structure to the open-economy case. Skill formation in developing countries has to be studied particularly with a view to analysing the phenomenon of skill migration between countries. We shall try to see whether our theoretical construct could be applied to analysing skill migration so as to indicate operational and useful societal policy prescriptions on the vexed issue of the (so-called) brain drain from the developing countries. In this connection, we shall explore the usefulness of describing international migration partly as a trade in differentiated skills or as "brain export" from the developing to the developed countries.7

A study of investment in education would, however, be left incomplete and inconclusive if the issue of societal intervention is kept out of its purview. Educational investments need to be treated differently from all other conventional investments, e.g., in physical capital, precisely because the former reflect significant existence of externalities. Analysing the types and nature of externalities that

7 This part of the analysis is based on my unpublished M.Phil dissertation. See Khadria (1973).
are specific to education, we shall, therefore, comment on
the necessity and the scope for societal, i.e. state inter-
vention in education - both in the form of public investment
in education and public control of private investments in
education. In this connection, we shall highlight the
advantages that the societal decision maker would have on
account of being better placed to handle uncertainty and to
enjoy economies of scale. All this would strengthen the case
for a public education policy. On the other side, we would
sound a note of caution about the problems involved particu-
larly in the handling of social questions of the kind relevant
to decision-making in skill formation.8 We shall conclude by
suggesting that the pursuit of market equilibrium would be
crucial even for this purpose, though with the qualifications
necessary for posing the social choice questions or using the
relevant collective choice rules being appropriately added.

Summarising the arguments which are basically aimed
at specifying the interactions between skill formation and the
markets, the policy implications for developing countries will
be spelled out in concluding the study. Investment in
education, particularly in skill formation, it is suggested
here, cannot be dealt with independently of the general policy
for economic development.

With these preliminary remarks we may now indicate
the chapter-wise details of the study.

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8 The discussion of the social choice dilemmas in this
context is due to Majumdar (1983).
Chapter 2 first briefly introduces the links between the two sectors of an economy, viz. that of education and the rest of the economy. It attempts to provide a comprehensive description of the rest of the economy in terms of the labour, commodity and capital markets, as well as that of the education market in the context of skill formation. A further classification of the labour market into three sub-sectors (the government, the business, and the professions), where the demand for skilled personnel generates is indicated. In the education market, attempt is made for pursuing a threefold classification of the agents supplying education and training into the productive firms providing on-the-job training, the profit-making private training institutions, and the non-profit school. As regards the nature of their activities, particularly the curriculae, each of these three agencies of skill formation has been described separately in brief sections.

The rest of the chapter deals with demand in the education market. First, following the statement of the objective behind the individual's demand for education, a discussion is initiated on the shapes of the individual and the aggregate demand for a particular quantum of education in the economy. In this connection, an attempt is also made to distinguish between the demand for lower and the demand for higher categories of education with respect to the nature of the income-groups concerned. Next, the impact of an improvement in the prospect for skilled labour in the labour market on the
aggregate demand for education is analysed in the form of a number of alternative assumptions. Finally, the chapter is concluded with a brief note on the composition of the aggregate demand for education when diverse and conflicting group interests are involved.

As a natural follow up of what is being said in chapter 2, the three institutional agencies in the education market are taken up for discussion in chapters 3 and 4. The focus here naturally remains on the education market. Chapter 3 deals exclusively with on-the-job skill formation in the firm which basically provides education only to its own employees. Chapter 4 takes up the other two agencies, viz. the profit-making training institution and the non-profit school respectively. In each of the three cases the objective or the purpose of the agent concerned is stated, the constraints are elaborated upon, and the mechanism of skill formation is analysed. Chapter 4 concludes with a note on the relative effects of the two agencies on the supply of skilled personnel as well as on the demand for them.

In chapter 5, the focus shifts from the education sector to the rest of the economy. Here the existence of an education market is assumed and the effects of the three markets on the decisions for investment in skill formation are analysed by relating them to the conditions in the labour, commodity, and capital markets, including the state of expectations in these markets. The relevant aspects of the market environment considered in this connection are the market size, the market form, the state of technology, and the
state of expectations. Attempt is made to show how these, separately or together, affect investment in skill formation. Pursuing the notion that skill formation is the outcome of investments in two complementary domains of the institutions and the individuals respectively, attempt is made to generalise how the market affects investment in each of the domain. Note is also taken of the possible cross-investments in the two domains: the institutions partly investing for the individuals and the individuals partly investing for the institutions.

The central theme of chapter 5, however, is to analyse how the different aspects of the overall market environment comprising the rest of the economy affect the willingness or incentive and the ability or capacity of each agent to invest in skill formation.

Chapter 6 is devoted to interpreting some historical material on skill formation in the light of the analytical framework developed in chapters 2-5. This interpretation is directed towards offering certain conjectures about the transition in education and skill formation over time. Skill formation in this connection is seen as passing through five phases with the emphasis being shifted back and forth among the three agencies of the firm, the profit-making institute, and the non-profit school. Describing the characteristics of each phase, the emergence of modern schooling is examined in a historical perspective. Historical material is provided on the structure of formal education in a number of countries (partly in the chapter and partly in an appendix) on skill
formation outside the school, and on technological change during the industrial revolution. This is brought in to support the conjectures. Finally, a brief note is added on the role of the market in skill formation.

Chapter 7 is presented as a digression on skill migration. Here, attempt is made to extend the foregoing analysis specifically to the open-economy case of skill formation in the developing countries. The motivations of the individuals and the institutional agents for undertaking investment in migration-induced or migration-oriented skill formation are spelled out. Similarly, as a counterpart to this, the behaviour of the developed-country employers towards sponsoring skill formation in the less developed countries is analysed. This is done through using a modified version of a part of the analysis in chapter 3. Having done this, the final section of the chapter is devoted to the controversial issue of brain drain. Refuting the logic of accepting brain drain as an omnibus category, we argue, in brief, how the exodus of skilled personnel could be seen as consisting of three distinct categories of migration, viz., a 'brain export', a 'brain overflow' and a 'brain drain'. Not wholly brushing aside the existence of a brain drain problem, the point is stressed that brain export could be treated as part of an ex ante, planned trade in skills. Simultaneously, the other categories of skill migration could be turned into an ex post brain export by undertaking suitable policy measures. Looking at brain drain this way, it is proposed, would add a new dimension to the analysis of skill migration by relating it
to the process of skill formation.

In chapter 3, this study is concluded by commenting on the role of the state in education and skill formation, as a societal decision maker. Putting forward the argument that societal intervention in skill formation is necessitated particularly because of the existence of externalities, their nature and types in education are sought to be specified. Next, such societal intervention is justified on the basis of the advantageous position of the state with respect to the handling of uncertainties and economies of scale. However, it is also stressed that the advantageous position of the societal investor is not unqualified. Rather, the societal decision maker is often faced with insoluble questions of social choice. Drawing attention to the types of social choice dilemmas (both explicit and implicit) that can arise in education, it is concluded that while social choice problems could be handled adequately, if not wholly satisfactorily, by the selection and acceptance of a consistent collective choice rule when the dilemma is explicit, it would be almost pointless to do so in the presence of market disequilibria where the dilemma is implicit. The only solution that would be meaningful in the presence of such dilemmas would be either that the disequilibria are not allowed to occur in the first place, or if allowed are automatically taken care of by the cushion provided by a sufficiently large market.

What the societal policy maker could do in this regard is to draw lessons for the future. One policy
implication that may be derived from the arguments of the study is that education be treated as part of the overall policy of development. The success of any skill formation programme would depend upon what policy measures the societal policy maker adopts in general towards generating large markets for absorbing the supply of skill, and with what success.