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Abstract

The manpower forecasting approach (MFA) was one of the first attempts in educational planning purposes. Manpower planners attempted: 1) to calculate the demand for manpower classified by occupation; 2) to convert this classification of demand by occupation into demand by educational attainment; 3) to devise plans and policies aimed at equating projected demands and probable supplies. The paper recalls the basic principles of the MFA from the perspective of the history of the economic thought and attempts to clarify why there was a virtual failure in MFA during the 1960s.

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1 Introduction

The manpower forecasting approach (MFA) was one of the first attempts in educational planning purposes. Manpower planners sometimes overlapped with the very first economists of education and, starting from certain assumptions about the level and composition of future economic activity and other relevant social and political variables, attempted: 1) to calculate the demand for manpower classified by occupation; 2) to convert this classification of demand by occupation into demand by educational attainment; 3) to devise plans and policies aimed at equating projected demands and probable supplies.

This paper recalls the basic principles of the MFA from the perspective of the history of the economic thought; discusses its origins (section 2) and shows that manpower planning was not a flourishing practice without theory (section 3). The final aim, however, is to clarify why there was a virtual failure in MFA during the 1960s (section 4) and how MFA was modified in order to provide some different approaches in the labour market analysis (section 5).

2 A survey of the literature at the origins of the MFA

Blaug established that educational planning was as old as state education, and that state education was much older than economic planning (Blaug 1967, p. 262). Undoubtedly, both the interest in central economic planning – before World War II – and the obsession with growth rates – after World War II – led to promote a different approach to the management of public and private education. More accurately, the attention to educational planning began in the 1920s in the Soviet Union (Louriè 1985, p. 249). Also in the liberal United Kingdom, in 1940, some sort of state intervention (or collectivist management) was unavoidable¹ (Cavanagh 1940, p. 143). At the end of the 1950s, extensive data collected by the Bureau of Labour Statistics, the Bureau of Employment Security, the Bureau of the Census, the Office of Business Economics, the Department of Agriculture and the Office of Education led to make a relevant number of predictions regarding the population in the U.S. and the labour force for the decade to come. Naturally, this posed

¹For a critique of the emergence and re-emergence of manpower forecasting and the British policy making, see McCormik (1977).

the question to the educators if the American labour force could rise so fast and so “adequately” in quality as the growth of the U.S. economy (Dawson 1960, p. 78).

This historical survey allows to set two main starting points. Firstly, beginning from the 1950s the “new” emphasis on education and training was the result of the policy concern about the underutilization of the human resources for the future (especially in the developed countries). It was necessary to measure the extent and the cost of this underutilization and to attempt to remedy the economic loss (Bolino 1968, p. 323). Secondly, facing the suspect that the neoclassical paradigm in economics could be an imperfect one, there were significant barriers to the “natural” attainment of maximal utility for the society as a whole. These barriers were systematic, and they profoundly influenced market outcomes. Thus, according to this analysis, attention to education and manpower planning derived from an interventionist tradition in economics. As with other forms of planning, it had a very first relevance in societies where structural changes were underway (Colclough 1990, pp. 4-5).

The two starting points and the idea to consider education as a factor of production made economists and policy makers aware that the labour force was a determinant of economic growth. This led to the development of models for educational or manpower planning. It is possible to approach this relationship between education and economic growth on the basis of several interpretations. First of all, the idea that education was both the source and the product of economic growth was proved by GNP growth of the countries that provided an increasing proportion of the national income to education. If we dwell upon this interpretation, economics of education was able to affirm that it was useful to spend on education in the future, but not the right amount for the optimum investment (Rado, 1966, p. 85). From a second point of view – that of the “residual approach”, associated with the names of Denison, Solow and Correa² – the attempts to show how much of the past economic growth was attributable to factors other than the physical growth of the labour force and of capital were seminal. Thirdly, inter-country comparisons between the levels of national income and the school enrolment ratios were underlined by the work of Svernilson, Edding and Elvin for the OECD³. Here, education was both a sign of wealth and a source of it, thus it was difficult to establish what type of education led to economic growth.

²(Denison 1962); (Solow 1957); (Correa 1963).

³(Svernilson, Edding and Elvin 1962).

More important was the fact that, to the extent that education contributes to development, the ability to achieve and sustain economic growth depended on the numbers who passed through school during the previous years and not on the actual numbers in school. Finally, the “rates of return” approach was associated chiefly with Becker’s work and treated the costs of education as an investment. It compared the costs with the returns, i.e. the additional private or social income directly or indirectly accruing to the recipients of education, or to the society in general. It was and still is a rigorous method of analysis but it showed its weakness in the ambiguity which surrounded any definition of the costs and returns of education.

In the 1960s, the main organizations interested in economics of education and economic planning were the OECD, the UNESCO and the World Bank. Inside the first organization, a study group on the economics of education was formed in 1962⁴. During the 1965’s meeting, it discussed the social objectives in educational planning and its conclusions contributed to the growth of OECD’s educational development programmes, particularly the Mediterranean Regional Project (MRP) and the Educational Investment and Planning (EIP). In July 1963, the UNESCO created a semi-autonomous body, financially supported by the World Bank and the Ford Foundation, the “International Institute for Educational Planning”. The centre had the aim to expand knowledge on educational planning in order to encourage all nations to accelerate their educational development as a prime requirement for general economic and social development. Thus, the branch of the economics of education, through its internal process of refinement, favoured the spread of the manpower projection literature. In the first half of the 1960s, the bibliographic references on the relationship among education, educational planning and social development were already numerous. Their review, though it made it clear that educators and economists had much unfinished business, shows 1150 references including sections on educational planning⁵. The International Institute for Educational Planning published in 1964 its own

⁴OECD’s Study Group attempted to cover global economic problems in educational development and moved on to consider many of the problems (institutional, organisational, financial and social) related to the development planning for education. The Study Group meetings considered in succession: *The Economic Aspects of Higher Education* (1962), *The Residual Factor and Economic Growth* (May 1963), *The Organisational Implications and the Link between Education and the Economic Growth* (November 1963), *The Financing of Education for Economic Growth* (September 1964).

⁵(Alexander-Frutschi 1963).

educational planning bibliography with 553 annotated references.

The literature on MFA aimed to link the provision of formal education to the “needs” of the labour market. Manpower studies often culminated in recommendations that x number of new students placed in the field y had to be created by the year z (Bowen 1964, p. 198). In this general scheme, real data were compared with the output expected from the supply of manpower to the labour market. The difference indicated either a surplus, with a consequent need to cut back on education in selected subjects, or a deficiency, requiring further investment in relevant areas of manpower development. Very often the figures projected were not based on the estimated need but rather on the maximum number that could be trained. Thus, the MFA aimed at pursuing the goal of realizing some specific economic targets and social development. In 1962 Parnes, one of the father of MFA, described the MRP as an attempt to carry out an assessment of the national educational needs in order to come up with detailed plans, including financial estimates. In the MRP the MFA was required to improve the information flow and to develop manpower plans. These were designed to improve the labour market process because the substitutability of labour inputs was limited, and because the supply of labour with specialist skills reacted only after a long time-lag. However, the usual methods of manpower forecasting were based on a number of assumptions which bore little relation to the realities of the labour market. The oversimplifications to which it resorted not only produced results that were often wrong but also limited employment policy to a role largely external to the labour market and distorted evaluation of the effectiveness.

3 The different methods in the MFA

The purpose of this section is to examine some of the methods used in analysing and projecting manpower supply and demand as well as in employment planning. The MFA focused on the modelling of total employment by economic sector, occupation, and – to a lesser extent – educational category. As a planning technique, the MFA included four stages. (1) A country’s overall economic output was estimated for a given future period, but the final model could provide measures not only of the levels of activity but also of their rates of change. An economy which was expanding fast, especially in manufacturing, needed to have more of its labour force absorbed in planning, training and being trained, than one which was growing more slowly

though using the same techniques of production (Layard and Saigal 1966, pp. 226-227). (2) The output was allocated across industry sectors and the labour requirements to produce this output were estimated. (3) The labour requirements were then translated into educational requirements, assuming that each job corresponded with a specific occupational level and type of education. (4) The forecast of educational requirements was compared with the stock of educated labour (adjusted for attrition and new entrants) and, on this basis, the need to expand or contract the output of the education system was estimated (van Adams, Middleton and Ziderman 1992, p. 264; Blaug 1967, p. 263). According to Harbison and Myers⁶, the most difficult aspect of manpower analysis was the determination of long-term future requirements. Because of the long time required for human resource development, requirements had to be estimated for a minimum of ten years and preferably for two decades in advance. This was due to the time required to build schools, to train teachers, to expand the number of university graduates etc. Human resource development planning, therefore, usually required a longer time perspective in comparison with most economic development plans.

Despite the four stages described above, it is impossible to find a generally accepted methodology for estimating future requirements. The first obstacle was to determine the meaning of the term “future requirements”, included between a “predicting” or “forecasting” sense and the attempt to produce “projections” for the future. Going from a meaning to another, it easy to discover, at least, nine MFA techniques.

(1) In the *employer survey method*, employers had been asked to specify how many persons with certain qualifications they would have needed in a given number of years to come. The responses had then to be aggregated in order to indicate the projected net total job opening by occupation (and skill levels) for the relevant target year (Bowen 1964, pp. 197-198). Employer surveys could be conducted as a full count or on a sample basis, requiring a complete and up-to-date listing of employing establishments. The inquiry method assumed that the interviewed employers possessed the capacity to look into future market prospects, industrial growth rates and

⁶Two “fathers” of the MFA have been Harbison and Myers. (Harbison and Myers 1964) contains the comparison of a set of educational and economic indices for 75 countries around 1960. (Harbison and Myers 1965) is a collection of essays on the manpower problems and plans of a number of Asian, African, and Latin American countries.

the corresponding manpower implications (Richter 1986, p. 35).

(2) A second general approach was *to project into the future the present ratios of trained manpower to total employment*, on the basis of demographic information and, in some cases, of assumptions about likely shifts in the relative importance of different industry groups. This method took into account the past trends in the utilization of manpower. In projecting the manpower needs of developing countries, recourse had to be done to the present ratios between skilled manpower and the total work force in countries at more advanced stages of economic development (Bowen 1964, p. 197-198).

(3) The above approach paves the way for the *international comparison method*, according to which manpower forecasting for a given country could be obtained by borrowing historical/current manpower data from countries at higher stages of development. The premise underlying this method was that different countries followed similar manpower growth path and a similar occupational and educational structures (Richter 1986, p. 37), conjuring up old theories on the progress of stadial development by Adam Smith and Friedrich List. In 1966, an articulated international comparison of empirical data established that there were not perfect but quite clear relationships between output per worker and the occupational and educational structure of the labour force. The relationship could be explained by the assumption that output per worker measured the techniques of production, which in turn determined the skill structure of the labour force (Layard and Saigal 1966, p. 248)⁷.

(4) Another generic *normative method* was based on the ratio between a specific occupational group and a task or service related parameter. For instance, the number of doctors per head of population. The nature of this method consisted in relating the needs for one group of manpower to another. A forecast of one group's requirements automatically led to a prediction of the needs for another. This approach of was widely used in countries with centrally planned economies to determinate the ratio of specialists required to manage a particular volume of work and to work out job descriptions (classification of occupations). Here, the appeal of the normative method lies in its logic and straightforwardness as well as in its relatively modest

⁷Obviously, the observed relationships was not perfect because the difficult in data comparison; the lack of an adequate measures of output per worker as one-to-one relationship to techniques of production; the international variety in propensity to "consume" education beyond the level needed on manpower grounds.

data demands and in the transparent calculation involved (Richter 1986, p. 34).

(5) The “pure” *manpower requirements approach to educational planning*⁸ required several steps in its procedure. According to Harbison and Myers,

“the patterns of output for the various sectors of the economy are projected for the forecast year, usually as set forth in an economic development plan. Then total employment for the economy as well as for each sector is estimated on the basis of some assumptions about productivity. For each sector, the total employment for the forecast year is allocated among the various occupations according to the occupational classification system which has been chosen. Then the requirements for each occupational category are aggregated from the various sectors to give the total stocks required in the forecast year” (Harbison and Myers 1964, pp. 196-197).

From a more rigorous point of view, the manpower requirements approach to educational planning was able to produce models that covered both sides of the labour market (for economic sectors, occupation, educational levels, age and sex). On the demand side, five passages processed the number of workers by educational level over time: 1) estimating the future level of GDP or output; 2) estimating the structural transformation of the economy as expressed by the distribution of output by economic sector as it evolves over time; 3) estimating labour productivity by economic sector and its evolution over time; 4) estimating the occupational structure of the labour force within economic sectors and its evolution over time; 5) estimating the educational structure of the labour force in given occupations within economic sectors over time. On the supply side four processes: 1) estimated the population; 2) assessed the number of graduates; 3) estimated the labour force participants by applying force participation rates to the number of graduates; 4) estimated the occupational supply based on the labour supply by education level possibly using an education to occupation matrix (Hopkins 2000).

These procedures – (1), (2), (3) and (4) – aimed at extrapolating past trends in the growth of the number of persons in a particular occupation, and then correlate this with total employment, production, population, GNP, or

⁸Provided by (Parnes 1962). As remembered above, one of the first manpower planning projects was the MRP in the early 1960s. Its main objective was to outline the educational requirements for the fifteen years, in order to reach specific targets for economic growth. The project was carried out in six Mediterranean countries: Greece, Italy, Portugal, Spain, Turkey and Yugoslavia.

some combination of such variables. The regression table thus obtained was then used to project future requirements for each occupation (Harbison and Myers 1964, p. 195). Obviously, the main conventional methods of forecasting manpower requirements were time series extrapolation or international comparison. In addition, manpower planners needed to be firmly grounded in analytical techniques such as multiple regression analysis, survey research methods and basic inferential statistics.

(6) An “all-inclusive” but generic approach, called *social objectives approach*, recognized that education was important also for non-economic ends. It assumed that a more educated labour force tended to promote economic growth. Therefore it was neither necessary nor desirable to attempt to measure specific manpower requirements for economic objectives. In this framework, some goals were taken for granted, such as the elimination of illiteracy, the increasing enrolment ratios in secondary education, the decreasing of the student/teacher ratios to desirable levels, the lowering wastage rates, and the improvement of standards (Harbison and Myers 1964, p. 199).

(7) The *econometric approach* used models with a set of equations describing the behaviour of a certain economy, in particular economic relationships between specific sectors and the “rest of the world”. By taking into account these relationships, an econometric model had to explore the impact of numerous determinants of future employment levels. The relevant output of these models was a set of estimates of levels of employment in various sectors for the target year (Richter 1986, p. 38). Tinbergen and Correa elaborated a relatively simple model of the input-output type⁹ in which they attempted to relate directly secondary and higher educational outputs to given rates of economic growth, without using the intermediate step of calculating occupational requirements. The manpower required for each educational level was calculated from a series of linear equations which related the stock of persons completing a given level of education and the number of students in each level to the aggregated volume of production. The main goal, here, was to suggest what structure of the educational system was needed in order to let the economy grow at a certain rate, and how that structure had to change with changes in the growth rate (Harbison and Myers 1964, p. 200).

(8) The *Harbison and Myers target setting approach* moved from an analysis of manpower requirements founded on a different viewpoint. First of all, as Adam Smith had outlined, Harbison and Myers argued that an educated

⁹(Correa and Tinbergen 1962).

and skilled population was an essential condition for economic growth but, at the same time, it was an end in itself. Thus, it was suitable to accept the comparative analysis part of the social objectives approach, including the comparison of economic as well as social and cultural objectives. However, it was desirable to use them as a check on forecasts made by other, in a more disaggregated methods (Layard and Saigal 1966, p. 249). The reason was that, in estimating future requirements, the human resource planner had to concentrate on setting targets rather than on making forecasts. The purpose of the target setting was not to make projections on the basis of limited assumptions about the attainment of one or two specific objectives, but to influence the future course of development. A target indicated a direction for action and its precise quantitative dimension was far less important than its function of indicating the direction of activity for the achievement of specific goals. Within this context, the problems of methodology in the target setting approach came into sharper focus as a “to do” list: *i*) the sensitivity of estimates, *ii*) the relationships between occupation and education, *iii*) the making of comparisons, *iv*) the construction of “multipliers” and the interpretation of “shortfalls” (Harbison and Myers 1964, pp. 202-208). This original contribute was useful to support the MFA processes only from a policy-making point of view. The *ii*) remained among the several unsettled questions, as it will be discussed in the next section.

Also the authors’ “philosophy” is quite problematic. Target setting was not very useful to solve the so called “dilemma” inherent in manpower and educational planning. According to Richards, manpower and educational planning were two major issues generally seen in conflict with each other. On one side, there was the obvious need to raise the general education level of the population, prompted by both equity and efficiency concerns; on the other, the need to have the technically skilled people available to induce investment in physical capital was prominent. After 1960, especially in the developing countries, many Governments preferred the second choice because manpower forecasting appeared to have more scientific arguments on its side and to be an essential element of a strategy of industrial growth (Richards 1994, p. 2).

(9) Finally, also the *rate of return analysis* could assume the role of a methodology in educational planning. This method consisted in calculating separately the social or the private costs of education, estimating the discounted social or private benefits of education and comparing the two in

order to figure out which parts of the educational system could be expanded or contracted. In each case, costs or benefits were a stream of expenditures or returns spread over the life of an individual while he was being educated or afterwards when he was working as a contributor to the production of the economy (Jolly and Colclough 1972, p. 242). The rate of return calculation, however, was not a typical methodology in the MFA, even if it could be useful in educational planning¹⁰.

4 The criticism against the MFA

1. According to Colclough, the MFA had its intellectual roots in the “structuralist” (perfect synonymous for the author of “interventionist”) tradition in economics (Colclough 1990, pp. 4-5). Therefore, those who attacked the MFA derived their arguments mainly from the neoclassical framework. If the market reflected skill scarcities by promoting increased wage differentials in favour of the relevant occupations, the higher wages elicited a supply response, thereby removing the shortage, and *vice versa*. The adjustment mechanisms, promoted via the market, occurred efficiently and quickly enough to render planning unnecessary. Consequently, the *normative method* in MFA had little relevance to situations where decisions were taken as a result of or in response to market transactions.

Following the analysis of a market economy, always from the neoclassical point of view, some criticisms underlined the MFA’s false assumptions about fixed coefficients and other variables relative to the factor prices. These opinions were based on the assumption of a fixed relationship between the number of workers and the quantity of goods produced. But goods and services could be produced with more or less labour, and labour of different kinds, as dictated by the economic conditions and the relative prices of labour and capital. In the traditional MFA these ratios did not change in response to economic circumstances and they were rigid (van Adams, Middleton and Ziderman 1992, p. 264). Thus, a very first problem was the neglecting of the elasticity of substitution between capital and labour and between highly-trained manpower and less highly-trained manpower (Bowen 1964, p. 198).

¹⁰A particular attention was given to the method of calculating rates of return to education developed by Jacob Mincer (Mincer, 1974). However, this work was strongly connected to the researches on income distribution (Teixeira, 2007, p. 107).

So, for example, if we look at the *international comparison method*, once a given technique (as measured by output per worker or capital per worker) was chosen, there were no possibilities of substitution between workers with different levels of skill. For this reason, the MFA used simplified models, which implicitly assumed the existence of forces tending to produce the same pattern of relative prices for different types of labour in countries with similar levels of output per head. The only possibility of such forces could be a similar pattern of costs at different levels of the educational system (Layard and Saigal 1966, p. 226). A similar argument underlined that MFA had to assume both that the price elasticity of demand for the services of workers in each occupation was zero, and that the elasticity of substitution between different categories of labour was also zero (Blaug 1967). This problematic elasticity ratio led some criticism to assert that MFA represented only a fix “technological” approach to planning; and that the technological method was inadequate because it treated the worker solely as a production factor, whereas his role as an income earner and consumer was crucial (Wéry 1978, p. 333). Usually, in the MFA scarce mention was made of physical capital as an element in forecasting manpower. The reason was that manpower and capital requirements were estimated at the same time (Layard and Saigal 1966, p. 224).

From this perspective, it was clear that the major problem in the educational “needs” of the labour market was the substitution rate among various skills. If substitution was possible, a variety of occupational or educational patterns could be consistent with a given economic plan or forecast. Obviously, there was a body of indirect evidence in favour of skill substitution. Generally, this took the form of revealing great differences in occupational or educational patterns between firms, regions, or countries that do not appeared to be attributable solely to corresponding differences in technology or other demand factors. Other support for substitution came from heuristic impression and experience which, though varying in quality, was often insightful. In this concern, the main problem was the choice of a single optimum set of occupational requirements among alternative sets. This led to explore different assumptions about factor substitution in manpower planning activities and, sometimes, to predict its abandon in favour of the rate of return. However, an attempt to provide some criteria for selecting an optimum set of educational or occupational requirements when skill substitution was possible could be that of minimizing the employer’s total factor cost for

a given output. Then one of the many criteria for selecting an optimum set of occupational requirements could be the minimization of expenditures on education, that was the minimization of the social costs of education for the manpower bundle required for a given national output. Alternatively, it was possible to select an optimal set of education or occupational requirements by minimizing the total factor cost borne by producer-employers, including especially costs of employing the labour, for the given national output (Skolnik and Smith 1972, p. 269).

It is quite difficult to define this kind of criticism. Founded on the translation of market input and output in prices, the “substitution criticism” is not far from the wider controversy capitalism-socialism. In fact, whereas the centrally planned socialist systems postulate that every member of the working population is entitled to have the job for which he was trained, this is not the case in the market economies, which basically focus on productivity and profit, and are less bound to full-employment policies. As a result, though the MFA was generally applicable in the socialist countries, it was not in neo-liberal economies. The difference between the two systems emerged from the study of the distinction between a forecast of manpower requirements and the actual absorptive capacity of the labour market. The imponderables that modify the factors of production at a particular time, the impossibility of accurately predicting modifications in production structures and markets, and the absence of a centralized system for controlling access to the different types and levels of education and training meant that any precise forecast was extremely illusory (Louriè 1985, p. 251).

2. Another set of criticism is developed not only from a neoclassical perspective but also from more interventionist approaches. In this case, the MFA is believed to be either too demanding in terms of data, time and effort, or otherwise unable to represent the complex interactions that produce outcomes in the real world (Colclough 1990, p. 9).

First of all, much of the criticism that occurred against the MFA focused both upon the reconciliation of the analysis of the present employment situation and the estimates of future manpower supplies with the specification of the composition of manpower demands estimated for the end of the planning period. This reconciliation indicated the magnitude of the required expansion of education and training facilities over the planning period (Colclough 1990, p. 4). On this point, the optimism of the early 1960s emerges simply by reading the proceedings of the “Conference on the economics of education”

promoted by the International Economic Association in September 1963: “It is now accepted that the targets of an economic plan can be converted into manpower demand at the various levels of qualification, and that the latter can then be expressed in terms of training programmes which determine the objectives of the education plan. These techniques (...) are more or less comparable to production functions with complementary factors” (Debrauvais 1962, p. 198). Nevertheless, MFA’s weaknesses were particularly evident when it was used for long-term forecasting. If we look at the *employer survey method*, we notice that it provided an informed judgment of short-term requirements, but it was quite unreliable for long-run estimates. From a different perspective, employers could find the ways to adjust to skill shortages and rising wage costs. They could employ capital to do the work of skilled workers who were in short supply, they could adopt new production technologies that required different skill mixes and they could often find more cost-effective means to increase the supply of skills. In many cases, this bypassed the need for lengthy formal education and reduced the need for large public investments in schools and training centres. It was therefore not surprising that manpower requirements forecasting, which discounted the likelihood of these adjustments, often produced large errors.

Secondly, the scarce predictive power was denounced by an embarrassing lack of data. To *project into the future the present ratios of trained manpower to total employment* was a MFA’s relatively easy operation, but its usefulness was limited. During the 1960s, in many countries it was impossible to get past data for adequate time series. And even where the data were available, the assumption that future relationships could be derived from past trends left the question open. In fact, the concept of forward planning usually implied that the future had to be different from the past (Harbison and Myers 1964, p. 195). In a wider sense, the lack of empirical data was the main problem in estimating the expected increases in productivity and in determining the required educational qualifications of high-level occupations for the forecast year. Thus, future manpower requirements based on productivity analysis were not less subject to arbitrary judgment than other approaches¹¹.

¹¹The SVIMEZ’s case, for Italy, was very indicative about the validity of some assumptions. SVIMEZ’s erroneous prediction was that, in 1975, only 165,000 graduates would be able to meet the needs of the Italian economic development. SVIMEZ’s research, at the beginning of the 1960s, represented an attempt to deal with the problem of school planning from a particular economic viewpoint, a strategy that was focused on four fronts: purely

3. The consequences of insufficient data information lead to a third decisive argument in MFA criticism, that is the conversion of occupational requirements into educational requirements. It was always one of the most perplexing problems in manpower analysis. Parnes himself made a threefold classification of occupations based on various levels of education, or their equivalents, but he pointed out that estimates of educational requirements could not be made mechanically on the basis of the total numbers in each classification. Except for the case of a few professions, there were no precise relationships between occupations and educational background. As in the Say's law, the solution of this problem could not consist in the axiom that the supply of educated manpower determined the demand itself. In other words, in the MFA the specification of the relationship between skill and education was decisive. Clearly there were many determinants of a person's skill (in particular: innate ability, motivation, education, training and experience, etc.). A particular level of skill could be acquired through many different combinations of these. One would not expect in any particular country to find all jobs requiring a given skill being performed by people with the same type of education. In conclusion, it was difficult to find a systematic association of average educational level with skill requirements (Layard and Saigal 1966, p. 229). The projection difficulties were particularly pronounced in the case of persons whose training was general, and it was for this reason that many manpower studies dealt only with particular professional groups, such as engineers. In fact, Ahamad and Blaug's¹² book abounded with examples of serious errors concerning engineers (India and Sweden), teachers (England and Wales), choice of inappropriate educational policies (Thailand), etc. Main failures arose from the inappropriate assumption of fixed labour inputs per unit of output. This approach provided reliable forecasts only in the short run. In the long run, projections

scholastic, sociological, techno-industrial and economic. However it did not succeed in making acceptable predictions for the medium to long term period because, in spite of having core ideas that could be appreciated for their straightforwardness, there seemed to be a high level of conjecture that referred too much to the international scenario and to ideal or typical reference points. Indeed the SVIMEZ managed to predict the magnitude of the GDP of 1975 more or less correctly, but did not have the same success with the level of productivity and unemployment. In other words, there was a miscalculation of the size of the variables, from which arose an insufficient estimate of the future need for human resources. See (SVIMEZ 1961).

¹²(Ahamad and Blaug 1973).

were necessary for policy decisions concerned with skilled manpower.

The very first wave of optimism in the MFA disappeared in the Ahamad and Blaug's thoughtful book. It was reviewed as a collection of ten detailed cases in which few labour market agents were so myopic as manpower forecasters. In those pages "Forecasters appeared unable to make elementary distinctions between demand and supply on the one hand, and requirements and stock on the other, and had even less notion of how labour market adjustments was carried through. In consequence, they persisted with mechanistic methods of forecasting which regularly produced ludicrous results" (MacKay 1975, pp. 107-108)¹³. This technique, nevertheless, remains popular also today in few developing countries.

5 The labour market solutions to the MFA shortage

1. As seen before, in the 1960s MFA was not completely satisfying both in methodology and provisional results. If read as a "technological method", it was based on a number of assumptions which bore little relation to the realities of the labour market. The oversimplifications to which it resorted not only produced results that were often wrong, but also limited employment policy to a role largely external to the labour market and distorted the evaluation of the effectiveness of the few measures taken in this field. Thus, a technique less concerned with projections and forecasting was needed. Nevertheless, if the intuitive support showed that education and training had some relevance for skill formation, a new focus on more detailed labour market relationships and phenomena was strategic. Manpower planners, especially when working in less developed countries, needed to adopt new perspectives: no more emphasis on the conventional question of what are the long term manpower requirements, but a different approach to the alarming shortage of job openings (Mehmet 1976, p. 68). The need for a "new approach to man-

¹³The reasons for the failure of the manpower planners in the 1960s were several others. One was the fact that they have been concerned almost exclusively with the relatively small manufacturing sector of the less developed countries and thus neglecting the large agricultural sector. It was a very serious omission, since upwards of 70% of the population in less developed countries lived in rural areas and depend on agriculture for their livelihood (Mehmet 1976, p. 67). Also in the business plans for manpower management no existed a general view of manpower planning which could guide the manager in constructing a program which assured that "the right numbers and kinds of people will be at the right places, at the right times, to carry a company's operations forward" (Walker 1969, p. 152).

power planning” emerged in the World Bank and in International Labour Office (ILO) researches. Central to the new approach was the recognition that “planning” was an out-of-date word, conjuring up thoughts of central mobilisation and disbursement of resources. The revision process began at the end of the 1970s, and in 1991, according to Psacharopoulos, “planning” was in disarray (Psacharopoulos 1991, p. 459). Emphasis shifted on manpower “analysts” who were more concerned with the targets of equity and efficiency. It was the answer to the criticism¹⁴ that had established that developing countries economies were best served by a educational policies which put less emphasis on manpower projections and more emphasis on analysis of the operation of various aspects of the labour market at all skill levels.

Therefore, the attention of the labour economists was captured by the analysis of imbalances in manpower supply and demand and by their underlying causes in different sectors, occupational groups and geographical areas. Using a variety of systems designed to signal or highlight significant trends in the labour market at either national, regional or local levels, the resultant indicators were employed to make decisions which improved the efficiency and efficacy also on the supply side, and which had beneficial influences on the performance of the labour market on the demand side. To achieve this balance the use of methodologies designed to take into account different issues as social benefits, educational investment, and training costs was required; all the while ensuring that the results are responsive to changing economic conditions (van Adams, Middleton and Ziderman 1992, p. 277). The emphasis on the supply side of the labour market was quite new, considering that many manpower forecasting studies mainly included social demand projections and rate of return analysis. Less attention had been given in the 1960s to forecasting the future labour supply (Ed 1996, p. 1).

A new interest on the labour market signalling (LMS) focused on education and training qualifications rather than occupational classifications. In contrast to the previous emphasis on occupations, the LMS techniques were and are concerned with economic outcomes measured in terms of wages and employment, which can be compared with the costs of specific education or training programmes involved. This provides a basis for determining desirable levels of public and private sector spending on education and training, while the results can be directly linked to productivity. Obviously, the identification and interpretation of LMS requires a basic understanding of the

¹⁴For example (Hollister 1986).

analytical processes which can be applied to labour market supply and demand (Gray, Warrender, Davies, Hurley and Manton 1996)¹⁵. The kind of LMS to be established, developed or improved should ideally be chosen by the main users and producers of labour market information.

Manpower information flows and analysis processes depends largely on LMS. The expression denotes the flow of labour market information which is significant and of direct use for decision-making in the broad field of labour market policy, including training needs assessment and monitoring. LMS carries messages or provides indications to decision-makers to initiate, modify or cease certain policies, programmes, projects or measures or, simply, to continue the course of action in progress. The national policy-makers and planners require longer-term, aggregate signals in the form of time series (i.e. the rate of population growth versus employment growth, the rate of unemployment and changing composition patterns; the unabated tide of rural-urban migration; the international migration and the “brain drain”, etc.) (Richter 1986, p. 13).

In competitive market economies, movements in wages and employment serve as signals of changes in the demand for and supply of particular skills. The careful monitoring of these signals by manpower planners provides a means of identifying trends in the balance of skills demand. For example, a real obstacle to the success of the MFA came from an increasing recognition that most medium and large scale companies operated within the labour market, preferring to hire unskilled workers and to train them on the job. Increasing recognition that LMS is widespread and preferred by most employers makes the traditional manpower requirements approach redundant. Instead, it highlights the need for a broader and more effective general educational preparation rather than the provision of specific, pre-employment vocational skills.

(1) Labour market signals are captured by monitoring the overall labour force activity and the movements in the wages and employment of workers with specific levels of schooling and training. A rise in wages or employment opportunities is a signal of excess demand for the skills involved, while a decline is a signal of excess supply. (2) In a market economy decisions can

¹⁵According to Gray, Warrender, Davies, Hurley, and Manton, it also implies the availability of reliable labour market data for: a) guiding private training decisions; b) managing training systems; c) improving labour market efficiency; d) planning public investments in training (Gray, Warrender, Davies, Hurley, and Manton 1996, pp. 19-20).

be made effectively by the managers of training programmes with the information they obtain or simply by building up good contacts between training institutions and enterprises. (3) The monitoring of wages and employment movements to obtain labour market signals for schooling and training can also be used to show how well labour markets are performing their allocative function (van Adams, Middleton and Ziderman 1992, pp. 267-274).

The LMS is a useful adjunct to the traditional tools of manpower analysis in that it advocates the need for wage and employment trends not only to guide schooling and training decisions but also to evaluate how well labour markets are functioning. The objective of signalling is that it can estimate whether there will be upward or downward pressure on the economic returns to investment in specific skills. Planners can monitor labour market conditions and evaluate training programs. They can also focus upon skills that are of strategic importance to economic development but take a long time to be acquired. Linked to the question of LMS is “how” to define the training needs of a given economy. A first approximation to define training needs (i.e. skill needs) is to use a list of occupations and then to see whether commonalities in skills can be identified among the occupations. An international standard exists for this, the ISCO (International Standard for the Classification of Occupations), and has been developed by the ILO. The main problem with ISCO lists is that they go out-of-date quite rapidly (Hopkins, 2000).

2. In the passage from MFA to LMS an interesting stage in progression was represented by the conceptual improvement provided by the BACHUE models developed in 1970s, always by ILO¹⁶. They attempted to capture the behaviour of the economic agents on both the labour supply and the labour demand across multi-equation systems. There were a number of general concepts common to all the BACHUE studies. Two of them, namely the segmentation of the labour market and the inclusion in its description of exogenous factors, led to subdivide the national labour market into a number of segments that varied in size according to the country in which the model was applied. The segments were defined on the basis of demographic, geographical or technical criteria, the characteristics of demand and supply.

¹⁶See (Moreland 1984). According with the colombian mythology, the goddess Bachué was the mother of the mankind. The BACHUE models were constructed under the ILO’s World Employment Programme. In addition to four country-specific models (tailored to the Philippines, Kenya, Brazil, and Yugoslavia), the project also included development of a somewhat less elaborated general model, Bachue-International.

Each segment formed a separate labour market with its own characteristics. The total population was thus broken down into regions, rural and urban areas, and agricultural and non-agricultural zones. The level of education or skill was a very important segmentation criteria: there were varying substitution possibilities between skill categories and between these and capital. The criteria used to determine the level of demand for labour varied from one segment of the labour market to another, but the segmentation was important from the point of view of manpower supply.

The main characteristic of labour supply in the BACHUE models was its relative mobility but, in opposition to what happened in most models and projections of the MFA, it was explained endogenously¹⁷. In the models, the supply of labour was therefore no longer treated in its totality but disaggregated at least according to the level of education and the locality, with sex and age as other possible criteria. The main conclusion in approaching to BACHUE models was that employment planning, also in a market economy, could be improved if the market mechanisms were described explicitly. The main problems related to those models was again the data problems, even aggravated, compared with the MFA, by the large volume of information needed to estimate the numerous parameters. Few developing countries possessed the necessary statistical base (Wéry 1978, pp. 336-340).

3. LMS and BACHUE are typical methodologies of a wider system called labour market information system (LMIS). It is an alternative to MFA but “means nothing more nor less than what it says - information about labour markets”. According to Hopkins, the mere collection of data sets without the sort of guide provided by a model is inappropriate. Thus, referring to LMIS as a weapon against the lack of manpower planning, seems to suffer from a shortage in the analytical framework. A minor criticism affects the scheme to provide labour market information through the use of key informants, that are community level data collected through local knowledge of particular categories of respondents public officials, teachers, businessmen, large farmers etc.

¹⁷For each individual, the decision to participate in economic activities depends on his own characteristics or on those of the household to which he belongs (sex, marital status, level of education, household income, etc.), as well as on the state of the labour market (structure by branch of activity. wage level, unemployment rate, etc.).

6 Conclusions

The primary aim of this study was to review, synthesise and comment on the various considerations and options related to the methodological and analytical approaches in the MFA. The main conclusions are the same discovered by Richter: the MFA “had relied unduly on manpower input-output norms which became rapidly out of date; it had failed to take into account substitution; it had placed too much emphasis on high-level manpower requirements; it had largely ignored the manpower development and utilisations issues in the vast informal sector; it had paid no attention to the cost of training of one type of manpower relative to another; it had produced inaccurate and misleading forecasts” (Richter 1986, p. 70). However, it is possible to make further remarks, especially from the point of view of the history of the economic thought.

Firstly, the MFA remained quite popular in the 1970s, 1980s and even in 1990s in many developing countries because it followed both a popular and logical procedure: the research of the economic/social development creating a demand for skilled labour that was balanced by the supply of the same market.

Secondly, this methodology would be greatly improved if both the concept and the term “forecast” were discarded, and if analysts would clearly indicate when they are making projections or setting targets.

Thirdly and mostly, against Harbison and Myers, the fathers of the MFA, most manpower studies could not provide better results combining different MFA approaches. At the end of the 1970s, economists of education and economists of labour demonstrated the need of a deep improvement in the analysis of labour market (i.e. LMS). In doing so, the aim of MFA was shifted away from educational planning, but not only because of the criticisms towards the first generation of manpower models. In fact, after the decade dedicated to the revolution of human capital (1960s) a stronger purpose to improve the information on (future) developments on the labour market rather than to provide a methodological guideline for the (future) investments in education was registered. Thus, early attempts to put education, training and labour allocation into a unique perspective and to solve them by optimization methods dissolved. This result was already predicted by a great specialist of economics of education and historian of the economic thought in 1966: “The basic argument involves four variables: demand and supply in

“the education market”, and demand and supply in the labour market. All of these are policy-variables, in the sense that they are subject to a measure of control by the public authorities. But only one of them, supply in the education market, is a policy-variable pure and simple, and some of them – demand in the labour market is an example – can only be influenced by the State to a limited degree. It is precisely this which creates problems for both educational planning and manpower planning” (Blaug 1966, p. 166).

Fourthly, the narration of MFA is a complete subject-study of the history of the economic thought that, despite a process of changing methodology, shows a sure beginning (Parnes 1962) and a sure end (Psacharopoulos 1991).

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