MISCELLANEA

MOKYR'S EARLY INDUSTRIALIZATION MODEL AND THE NEW ECONOMIC HISTORY METHOD

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Although more than twenty years have passed since the New Economic History sent shock waves through the profession in the United States, it seems to have made little headway in Europe. It is true that in Europe as elsewhere the proliferation of quantification and quantitative approaches continues. New historical data series have been collected an others reformulated, so that they are compatible with modern economic concepts. But, although one may occasionally find a young economist trained in neo-classical economics venturing into the historical field, so far this has not caused a deplorable rift in the profession, as David Landes claims it did in the United States. (1)

There, as well as in Europe, those educated in the purely historical methodology often do not have the necessary background in economics and mathematics to appreciate fully the advantages and limitations of the new techniques. On the other hand, the new economic historians were not always helpful in smoothing sensibilities. They tended to be rather arrogant and overzealous in the promotion of their work and generally unsympathetic towards

(1) D. LANDES, "On avoiding Babel. Presidential Address, Thirty-Seventh Annual Meeting of the Economic History Association", *Journal of Economic History*, XXXVIII, March 1975, no. 1, 3-12.

the view that their approach should be made more comprehensible to their fellow scholars.

From this resulted, as Landed called it in his presidential address to the 1978 meeting of the American Economic History Association, a "Babel" situation. It has now become necessary to distinguish the "economic-historian, historian" from the "economic-historican, economist", and the two species hardly communicate. The traditional economic historian, unfortunately, had to face a distressing choice : either to made a considerable effort at retooling skills or to continue in the old ways, thereby seeming to take a backseat in the profession.

In Europe, the attitude of dismissing the invasion of the discipline by formal economics as a "typical American aberration" with no relevance to Europe, is still very prevalent. However, a twenty year old "aberration" starts to acquire a certain aura of normalcy. It seems that the new economic history is here to stay and will eventually also invade the old world.

Europe's educational system was slow to incorporate new methods from various ancillary disciplines. Only a little more than a decade ago the curriculum at the major universities in Belgium was changed so as to make it possible for regular history students to take some basic economics and statistics as options. Although these courses do help, familiarity with elementary economic principes and theories and some basic statistical techniques is not sufficient to grasp fully the possibilities and limitations of the neo-classical theoretical approach, let alone use it. Therefore, most new economic historians are and need to be fully trained economists. Regrettably, among some U.S. economists, this may have created the tendency to regard economic history as a mere area for empirical work, as another field for applied economics, elevated to the status of a speciality by calling it "cliometrics". Is this fairly recent change in nomenclature an admission of failure to renew the discipline of economic history or an attempt to gain stature in eyes of the economists ? In any case, the economist cannot claim to be an economic historian just because he deals with economic problems in the past. The mere use of historical data to test economic models and theories does not make one an historian. The historians justifiably may reject those parts of the cliometricians' output that are mere exercises in econometrics, where historical data are "tried out for a fit" for economic models.

The best work by economists-historians such as that of Fogel and Engerman, Williamson or Douglas North can not be so easily dismissed. With few exceptions, the new economic historians have not ventured outside North America and their work was therefore easily ignored. However, in a book called "Industrialization in the Low Countries, 1795-1850", (2) Joel Mokyr tackled a complex and important European issue. Although it was published in 1976, one gets the impression that, especially in Belgium, it has not been given the attention that the importance of its subject deserves. One wonders if this is not due to the above mentioned "Babel" phenomenon.

Joel Mokyr is a self-confessed cliometrician and with "Industrialization" he earned a Ph.D. at Yale University. Maybe youth explains the arrogant tone of the book The belittling way he treats respected historians on whose spadework he relies heavily, did not help to create the goodwill necessary for the acceptance of his approach. He proposes nothing less than a "model for early European industrialization". According to Mokyr, the early industrialization of Belgium was made possible by the existance of widespread rural industries which kept the wage level low. The relatively high wages levels in the Netherlands explains this country's retardation in spite of apparent initial advantages. His model explains why the low wage is necessary and how it leads to capital accumulation in the modern sector. How the author deals with evidence throughout the book as well as the actual model, which is a composite and an elaboration of existing economic models, offer good examples of the neo-classical approach But first, it is maybe helpful to summerize and evaluate what this approach entails.

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Neo-classical economics presents a synthesis of Marshallian and Keynesian economic traditions. It is essentially a theory of choice. From the premise that the economic problem is one of relative scarcity of resources, neo-classical theory explores and attempts to

(2) J. MOKYR, *Industralization in the Low Countries (1795-1850).* Yale University Press, New Haven and London, 1976.

explain human behaviour in terms of alternative uses of those resources and the costs of those alternatives. This approach is extremely fruitful in clarifying decision-making at a given point in time. Although hypotheses are derived from the behaviour of individuals who are assumed to maximize the benefits from perceived options, the theory nonetheless attempts to explain group behaviour.
Consequently, a degree of aggregation and abstraction is required that forecloses any explanation of particular decisions by a human actor or of a particular historical event.

In the building of the theory, strict rules derived from the natural sciences are followed. The conditions under which the theory is to apply, the basic variables which come into play and the relationships between the variables are formally defined so that the hypotheses and the predictions that derive from the theory are subject to refutation by logic and by accepted testing procedures. The testing of such theories requires the use of quantitative methods developed by statistics and econometrics.

In sum, neo-classical theory offers a powerful analytic tool in the analysis of choice, explicit hypotheses, established testing procedures and the sophisticated use of quantitative data.

Adopting the neo-classical analytical approach and applying some of the derived theoretical models to economies in the past, new economic historians so far have been able to revise and reappraise a good number of interpretations of historical economic development. The approach provides insights into the interplay of economic variables which permits to examine more clearly the important aspects of the issue. Their focus on the use of quantitative data, not only (as old economic historians do) to provide supporting evidence, but as an intrinsic part of the analysis, has resulted in a considerable increase in new or more useful quantitative information.

Old economic historians have developed interpretations that weave together a greater number of interdependencies and thus produce valuable insights into broad developments over time. The best historical work, whatever the scope of the subject at hand, contains theorizing of some kind as well as description. However, without a rigorous analytical approach, too often only impressionistic views emerge. These insights thus acquired might be illuminating and stimulating — and with the best historians they ususally are — but they cannot be subjected to scientific testing and refutation. In addition, any historical interpretation contains "if" statements and certain behavioural hypotheses; in other words, the explanation is only valid, if a consensus about the prevailing conditions exists and if it is agreed that people react as described. Many historians however neglect to make these assumptions or hypotheses explicit.

The most frequent criticism leveled against the new economic historians is their extensive reliance on quantitative methods in the face of the poor quality of the data that are at the disposal of historians, especially for the earlier periods and more specifically for Europe. Here we have to agree with Douglas North and Donald Mc Closkey that we have only started to scratch the surface. (3) Fortunately, the possibilities created by the combination of traditional historical criticism, modern quantitative methods including the use of computers, and the advances made in statistics are very promising. While historical criticism can make us aware of the limitations of a source, statistics alone can give us indications on its proper use in the face of these limitations. For instance, statistics cann tell us with far greater certainty how large a sample must be, or how few observations we need in order to derive sound inferences from the source and moreover statistical theory can tell us how to proceed with the task. (4) For those areas of economic history that can be subjected to quantification, — and those areas are more numerous than is generally realized by historians — the use of the most advanced methods is therefore indicated.

The most basic criticism that can be directed towards the new economic historians is that their efforts have been largely limited, so far, to the application of neo-classical theories and models to the past. The results are less impressive than those of the economist because of the inadequacy and scarcity of historical data. The explanatory power is also limited because of the basis deficiencies of existing neo-classical theories and models for the purposes of the historian.

(3) D. McCLOSKEY, "Does the Past have Useful Economics ?" *Journal of Economic Literature*, June 1976, XIV, 2, pp. 434-461. D. NORTH, "The New Economic History after twenty years", *American behavioral Scientist*, 21, no. 2, Nov.-Dec. 1977, pp. 187-200. IDEM, "Structure and Performance : The Task of Economic History", *Journal of Economic Literature*, XVI (Sept. 1978), pp. 963-978.
(4) An example of this type of contribution is B. SPENCER, "Size of population and variability of demographic Data (17th and 18th Century)", *Genus*, XXXII, no. 3-4, 1976.

We are referring in the first place to the lack of real time in any model. Most models are "static", meaning that a time element does not enter into it at all. Some models are said to be "dynamic", but this merely means the tracing of a certain course, the different stages of which are dated from time zero to period one... to period n. Neither the starting point nor any subsequent "period" can be identified with any particular historical date.

The reason this approach works for the economist is that he usually considers the historical constraints, or the environment within which decisions are taken, as given. Neo-classical economist have, in other words, focussed on performance and disregarded the underlying structure. (5)

The basic ideological premises underlying neo-classical economics, that first the free market is the most desirable and efficient device for allocating resources and to a great extent, also for distributing the product, and secondly, that individuals operate within that system as rational, calculating human beings, has led to a neglect of consideration for decision-making of institutions such as governments and households (on fertility, for instance) and of the impact of organizational arrangements, such as guilds, unions of corporations. Only during the last decades have economists attempted to explore, for instance, the economics of bureaucracies or of large corporate bodies. (*)

According to North, economist have worked under the assumption that there are no costs involved in operating the economic stystem. These are costs that derive from the existence or absence of particular governmental or private institutions encouraging or inhibiting profitable productive activity. These are loosely

(5) D. NORTH has dealt effectively with this aspect in particular in his article, "Structure and performance..., op.cit.", and in "The New Economic History... op.cit." We are heavily indebted to North for this part of the survey.

(*) I do not mean that economists have neglected such developments of the market structure as concentration of power in the hands of few corporations e.g. oligopoly. But that they most concentrated on their performance in the market — Only fairly recently they started paying attention to the question of how the profit maximizing behaviour of firms can be influenced by different organizational arrangements which would lead to a more sophisticated theory of the firm. This is related to the economics of bureaucracies, a line of theoretical research that is pursued in some of the major business schools such as Harvard or Carnegie-Mellon.

identified by economists as "transaction costs." Although well aware of the existence of those costs, most models and theories assume them to be zero or, at best, that they do not change much over time. The historian however, can not work under that assumption because they are precisely the heart of the historian's problem in explaining development.

Transaction costs, according to North, can be said to define the historical constraints within which an economy performs and their elimination determines the profitability together with technological determinants such as technical innovation and economies of scale. The less developed a society, the higher are the transaction costs and commonly institutions are molded by the pressure to reduce transaction costs. Thus corporations evolved among other things, to reduce the risk of investing and the costs of gathering the necessary financial means, while stock markets reduce the cost of information and transferring property rights, etc...

Economists are now addressing themselves to more of these fundamental issues. They have tried, for instance, to relax their assumption of total information and to establish the consequences of decision-making under conditions of risk and uncertainty. Still, there is some doubt as to how far the choice-theoretic approach can lead to useful explanations of historical development since the historian is mainly interested in understanding how the underlying historical structures determine individual decision-making and how human decisions change those inherent constraints. We assume in all this, of course that one aggrees with the basic neo-classical view of the world and of human behaviour.

In conclusion, the new economic historians have made a significant contribution to the advancement of economic history by making historical enquiry a more scientific discipline. The use of the advanced quantitative methods for testing hypotheses has enriched our knowledge of the past and greatly increased the data base. The application of modern economic analysis has produced successful revisions of historical interpretations slighted by the use of implicit theory and vague assumptions. However, the neo-classical economic approach presents real limitations for resolving the complex, fundamental issues of economic history. At the heart of the historical interest lies the problem of economic change, whether it be growth or decline. As North points out, a serious study of economic growth in neo-classical fashion, requires theories dealing with at least such fundamental issues as population growth, technological change, evolution of property rights and a theory of the state. (6) If the new economic historians cannot successfully address these issues their efforts will probably be disappointing and sterile.

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Let us now go back to Mokyr's "Industrialization of the Low Countries." From the layout of the book the theoretical approach can be easily demonstrated. After summarily describing the state of the Dutch and Belgian economies around 1795, Mokyr traces subsequent economic development through the first half of the 19th century, contrasting the South's successful industrialization with the North's stagnation. These parts are based on well known published material and literature and a limited amount of archival sources, but the evidence is handled in such a way as to lay the groundwork for the assumptions he will use in his model. Two of the more important ones are that the labour force for the modern sector was mainly drawn from the "pseudo-labour surplus" (*) generated by the cottage industry in the rural areas surrounding the different growth regions and secondly, that no financial market existed for the modern sector and hence that capital was accumulated by reinvestment of profits.

The advantage of the formal economics method shows up even in these largely descriptive parts of the book. A good example is the handling of an important question concerning the respective roles of circulating and fixed capital. Upon mentioning Lebrun's evidence of the large amounts of liquid capital held by the Verviers wool manufacturers, the question arises if the availability of "working" capital prior to modernization could have played a significant role in the accumulation of fixed capital. If modernization reduced the absolute amount of circulating capital required, then the accumulation of fixed capital could have been financed by partial

(6) D. NORTH, *The New Economic History...*, *op.cit.*, pp. 193-194.

(*) In Mokyr's model, unlike in the original Lewis labour surplus model on which it is based, the labourers are gainfully employed at a mixture of agricultural and industrial activities but Mokyr maintains the predictions from the model are identical.

substitution of fixed capital for circulating capital. To answer the question, Mokyr develops a formal theory which predicts that for the expansion of the industry rising amounts of *both* fixed and circulation capital would be required and then computes the demand for circulating capital from Lebrun's data, which affirms this point. (7) It is difficult to see how the traditional historian could settle this question on the basis of empirical evidence alone. No wonder the issue has been glossed over in the traditional literature although its significance is clear. The example also illustrates Fogel's point about facts often "impersonating" theories. (8) Historians have been guilty of using data on the different types of capital or investment without specifying or without even being aware of the need of a working hypothesis on their respective roles in the process of capital accumulation.

In chapter four, the author presents his model by first stating the assumptions, then identifying the variables and describing his hypotheses which lead to the presentation of a "growing-up process" that explains how rapid transition to modern industry was possible for the Belgian textile industry while the absence of the key factors prevented the Dutch economy from doing the same. In the following chapters the validity of the model is tested by providing evidence of comparative low wage levels in Belgium in the initial stages and of the persistence of these lower wages throughout the first half of the 19th century. The next chapter is devoted to a discussion of alternative hypotheses which stress other key factors such as resource endowment, demand, entrepreneurship and economic policy. These, of course, according to the author, present less rewarding explanations. Finally, the last chapters discuss some of the consequences of industrialization in the Low Countries.

Mokyr has rather skillfully tried to deal with the limitations of the neo-classical models with regard to the absence of real time, the inherently static nature of the models, the existence of transaction costs, the incorporation of different technologies, prices and population change. To discuss each of these aspects in detail would lead us too far. We will limit our comments to the most important ones.

(7) MOKYR, *op.cit.*, pp. 48-50.

Although Mokyr claims generality for his model, it is in fact only applicable to the textile industry. Even if we accept the legitimacy of focussing on this one leading sector, serious problems arise. In particular, for the purpose of simplicity and abstraction he has to assume there exists some product called a "textile" and two ways of producing this product, a traditional and a modern one. Strong assumptions, which are not relaxed afterwards, are related to this. The homogeneity of the product is maintained throughout. Concerning the production function of the traditional sector, the Z-good sector as the author calls it, is assumed to use negligable amounts of fixed capital, to experience constant costs and not to accumulate capital.

However, during the crucial period from the 1790's to the 1820's the growth process that occurred consisted mainly of the introduction of mechanical cotton spinning, the modernisation of the spinning end of the wool manufacturing and the establishment of a textile machine industry in addition to the organizational systems these developments required. The "textile" of the modern sector was thus in fact, at this time, mechanical produced yarn, which was a major input for the weaving and finishing processes, still largely performed by the traditional sector. It would be unreasonable to expect that the greatly increased output of the modernized sector would not have effected any change in the cost situation and the accumulation of capital in the traditional sector. Because of the inadequacy of statistics for that period it is difficult however, to get supporting evidence for this.

Only in the late 1820's did mechanized carding and weaving spread in the cotton and wool sectors. Finally, in the 1840's, successful mechanization of the linen manufacturing led to the ultimate and rapid demise of the traditional cottage industry.

It is, in our opinion, important to preserve the sequence of events because for one thing, the historical environment of the 1840's had significantly changed from the beginning of the 19th century. The above reveals the problems of the neo-classical approach with historical time and specificity.

The problems in dealing with transaction costs can also easily be demonstrated. The author avoided some major theoretical problems in relation to transaction costs by concentrating on the textile industry. It is necessary however to consider other leading sectors. From the late 1820's on, the relative importance of the textile sector as a vanguard industry fades and focus shifts to a significant extent to the coal and metallurgic sector. It suffices to draw attention to some of the "constraints" in these sectors to illustrate the inadequacies of Mokyr's model for general application.

In the coal mining industry, grave structural and organizational problems existed because of a history of antiquated legal and customary practices, which led to a fragmentation of property rights. This inhibited the accumulation of capital and the introduction of capitalistic organization. The bottleneck was solved through the creation of modern corporations on the initiative of capitalists affiliated with financial institutions. (9) A general theory of the "growing-up process" in this sector needs at least to incorporate an explanation of the growth and role of institutional arrangements and of entrepreneurship.

Mokyr's assumption about the reliance on reinvestments of profits as the sole source of financing capital accumulation will have to be dropped in view of the subsequent access to the financial market through the continuing affiliation of the mining companies with investment banks. This also applies to most of the modern metallurgical establishments.

Furthermore, there is a problem with the assumed homogeneity and adaptability of the labour force which has repercussions on the wage structure and the profitability of modern production. The greater requirements for a variety of skills and discipline in these sectors created problems of scarcity and other frictions which would distort the picture Mokyr's paints of a smooth absorption process of the rural labour surplus by the modern sector.

Mokyr also minimizes the role of demand factors. This is another assumption that cannot, in our opinion be maintained in the case of the metallurgical sector.

Other problems with the assumptions of the model can be detected with regard to the assumed exogeneity of technological change, the role of economic policy etc...

(9) J. LAUREYSSENS, "Le crédit industriel et la Société Générale des Pays-Bas pendant le Régime Hollandais (1815-1830)", *Revue belge d'Histoire contemporaine — Belgisch Tijdschrift voor nieuwste geschiedenis (R.B.H.C.-B.T.N.G.)*, III, 1972, 1-2, pp. 135-140 and "The Société Générale and the origin of industrial investment banking", *R.B.H.C.-B.T.N.G.*, IV, 1975, 1-2.

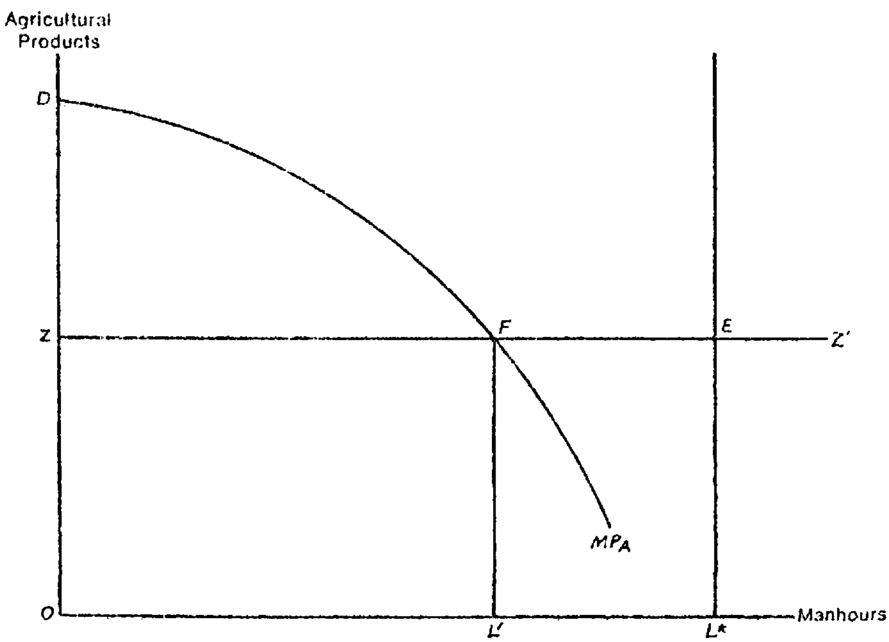
In conclusion, a word about the appropriateness of national comparisons for explaining European industrialization. The Netherlands "backwardness" in the face of its neighbours' "forwardness" raises intriguing questions that beg explanation. But, are we likely to gain valuable insights into the European industrialization process by juxtaposing these two countries ? I consider the answer to this question to be negative. Numerous books and articles have been devoted to the explanation of France's backwardness in comparison to England in the 18th century. Relative to the effort expended and in spite of the quality of the work, the results in terms of gain in understanding the development process have been rather disappointing. (10) This is mainly due to the fact that modern industrialization as it spread through Europe did not respect any national boundaries. (11) There exists persuasive evidence that Belgium should be considered as being part of one economic region that stretches like "a curved dagger" from Northern France to Rhineland-Westphalen, Alsace and even parts of North Western Switzerland. The whole region was a pocket of early industrialization in the period 1800-1865. At that time, Holland cannot be considered a part of it in spite of the fact that the lower Rhine, the traffic artery for that region, flows through Dutch territory.

So a more meaningful approach would start from the premise that France, the Low Countries and South Western Germany, possessed sufficiently comparable socio-economic and political structures, were subject to roughly the same historical events such as the Napoleonic wars and reforms, and faced the same opportunities in terms of markets, availability of English technology, etc... The comparative question would then be why the adjoining regions, often belonging to the same political unit, did not. By using a nation by nation comparison Mokyr follows the beaten path of the traditional historians. To cite Sidney Pollard's beautiful methaphor : "We have tended to treat each country like a plant in a separate flower pot, growing independently into a recognizable industrialized society according to a genetic code wholly contained in its seed". (12)

(10) e.g. works by E. Labrousse, Fr. Crouzet, Ch. Kindleberger and D. Landes.
(11) Sidney POLLARD, "Industrialization and the European Economy", *The European History Review*, ser. 2, 26, 1973.
(12) S. POLLARD, *op.cit.*, p. 637.

A comparative approach placed in a more general European context would more truthfully reflect the reality of the dynamics of European modernization. Within that context the leading role of Belgium still awaits explanation.

Figure 4.1 Equilibrium of an Individual Peasant in the Traditional Sector



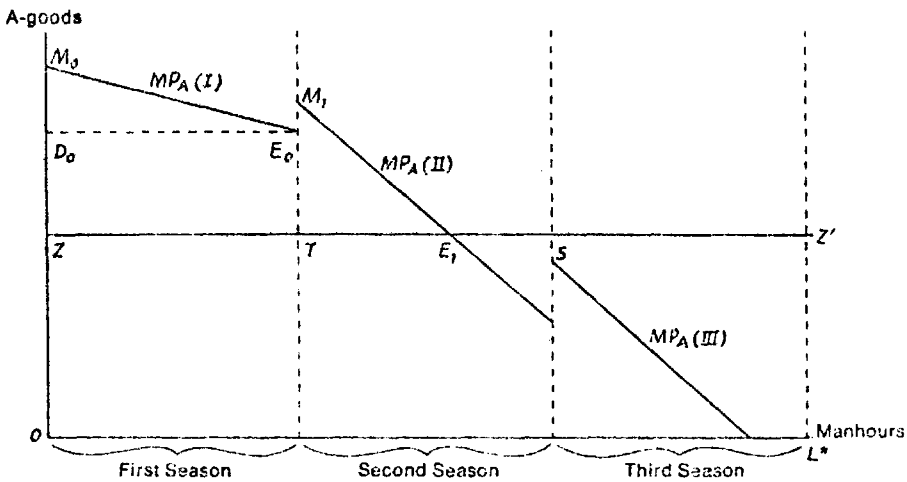


Figure 4.2 Seasonality and Z-good Production in the Traditional Sector

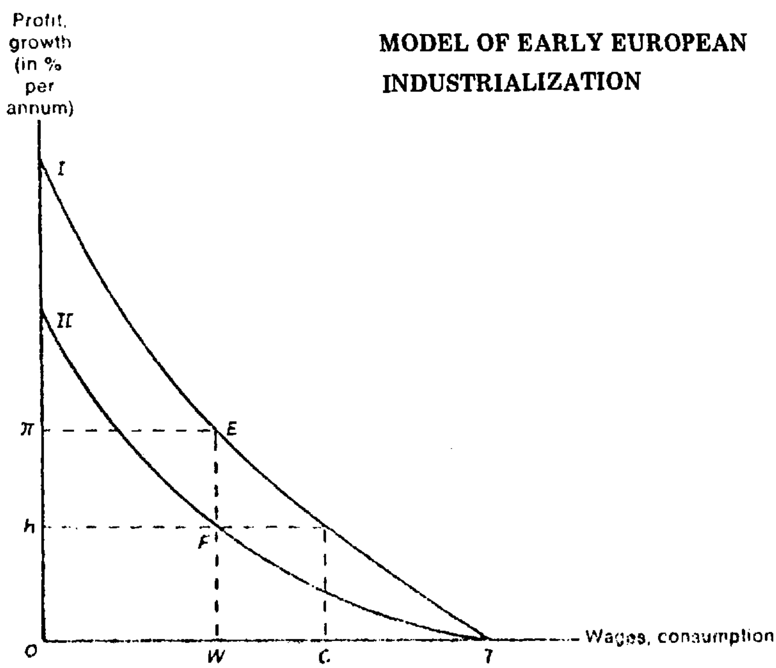


Figure 4.3 Distribution and Accumulation in the Modern Sector

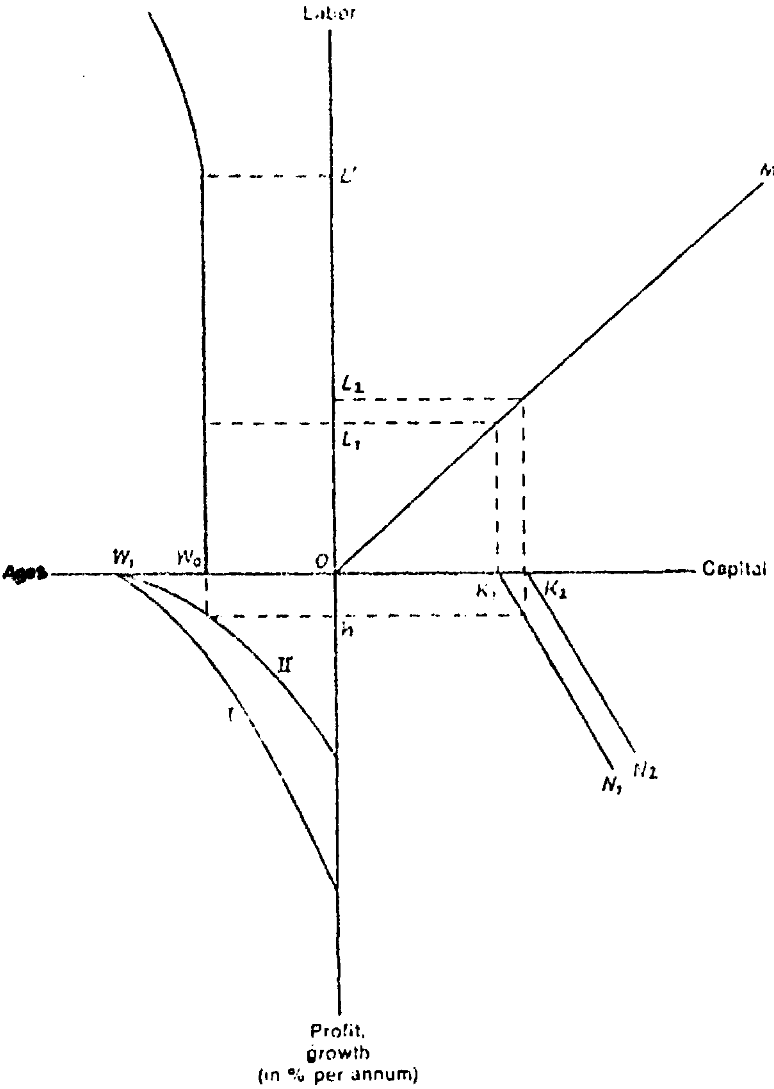


Figure 4.4 A complete Model of Growing Up

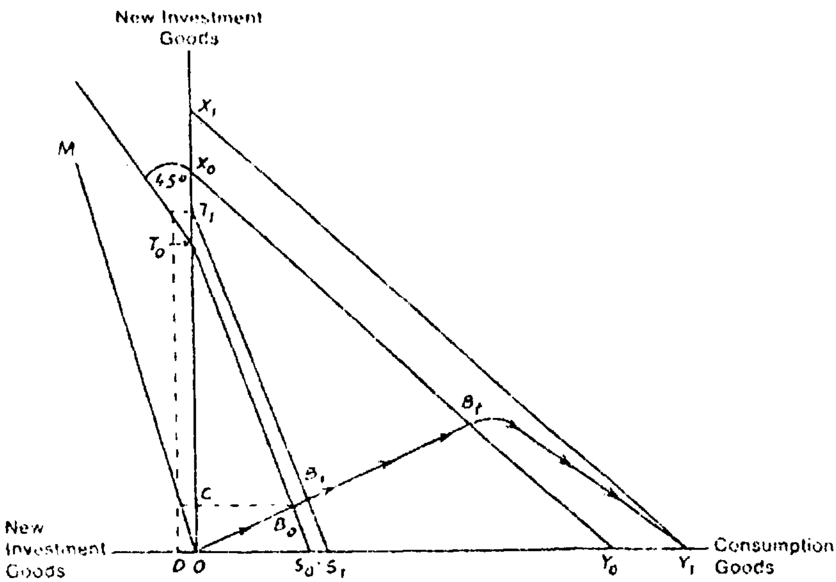


Figure 4.5 Allocation and Accumulation in the Modern Sector

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