*Typologies of Industrialization in Historical Perspective**

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1. Introduction

Historians do not usually deal with the discovery and presentation of patterns but with the origins and implications of single events. By contrast, economists' main concern is to investigate, if possible in a deterministic way, the rules and patterns which bind the economic system (Gould 1972, p. 378). On the other hand, economic historians stand at the place where the economists' and historians' views confront each other.

One of the principal fields of interest of economic historians is undoubtly the process and implications of industrialization. Not only economic historians, but also a large number of historians and theorists, concentrate their efforts on the study of the phenomenon of industrialization. In this attempt, as Supple (1963, p. 8) has noticed before, "... both less abstract theorists and more systematic historians will benefit from tolerant as well as sceptical borrowings from each other to alleviate their respective deficiencies."

Before proceeding, it would be useful to define industrialization. In a broad sense, industrialization is the system of production that has arisen from the steady development and use of scientific knowledge (Hughes 1968, p. 252). In its strict sense, the term is meant to denote a phase in economic development in which capital and labour resources shift both relatively and absolutely from agricultural activities into industry, especially manufacturing.

Although the beginning of modern industrialization has generally been dated with the emergence of the British industrial revolution in

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the mid-eighteenth century, the origins of it can be found in the distant past. Industrialization, therefore, is the outcome of a long and complex historical development, and it obviously has not yet run its full course as a long-range historical phenomenon.

It should also be mentioned that industrialization was a noticable feature of many economies as early as the second half of the nineteenth century and became the major target of all developing countries after the Second World War.

Starting from this point of view, the main objective of this paper is devoted to the analysis of the typologies of industrialization from the historical perspective. Emphasis is given to the pros and cons of each typology attempting to analyse the industrialization process. An additional aim is to evaluate historical experience to derive a path leading towards industrialization for the new developing countries.

2. "Single-Factor" Argument

As is well known, the most important characteristic of the industrial revolution is the substitution of inanimate energy for that provided by animal and human power via technical improvements.

In an article titled "The Cause of Industrial Revolution: A Brief "Single-Factor" Argument", Gaski (1982) provocatively argues that there was, indeed, a single factor which was responsible for the occurence of the industrial revolution in Britain in the eighteenth century. Among a number of factors, such as sufficient population, agricultural development, capital accumulation, technical innovations, adequate demand and markets, sufficiency of national resources and favourable economic climate, which are considered as necessary conditions, Gaski suggests that only one factor, technology, presents a sufficient condition, because it alone could have induced others (Gaski 1982, p. 228).

Gaski's methodology is to identify a number of factors which are characterized as necessary conditions for industrialization, consider each factor on its own, and then find it to be a necessary but not sufficient condition to cause industrialization, and finally identifies technology as not only necessary but also a sufficient condition for industrialization.

The cornerstone of Gaski's argument is the vital relationship between technological advances and demand. Technological changes have linkages with other necessary conditions which operate through the laws of demand. Technological improvements increase output which create their own demand via Say's Law and this demand filters through to the other necessary conditions.

In the final analysis, technological innovation appears to be a kind of exogeneous, "God given", factor capable of inducing the other necessary conditions for industrialization.

As can be expected, Gaski's analysis has been challenged by various writers. In an attempt to falsify Gaski's formulation, Geary (1984) argues that there is a confusion in the use of the terms of necessary and sufficient conditions, and there are theoretical inconsistencies in the treatment of each of the factors. Additionally, he points to Gaski's failure to specify quantitatively the magnitudes and the rates of change of the factors which make up the necessary condition for the transition from the pre-industrial to industrial economy. This means that all the factors which are cited by Gaski are non-operational, and therefore, Gaski's formulation can be neither confirmed nor rejected.

In an attempt to outline and refute the main aspects of Gaski's argument, Bruland (1985) concentrates on the false interpretation of Say's Law by Gaski. According to Bruland (1985, p. 190), Gaski's position is the suggestion that supply decisions involving technological change do not meet with demand problems. On the contrary, such supply will create demand for the product concerned.

But, it should be stressed that Say's Law, in a very broad sense, deals with the equality of national demand and national supply. While demand may not be a factor independent of supply at the aggregate level, it is vital at the level of individual decision-making processes of firms (Bruland 1985, p. 190). If this is true, Gaski's whole argument can be refuted since technological change cannot be the final, but is at best the "proximate", cause in explaining the industrialization process (Bruland 1985, p. 191).

Besides the above deficiencies in Gaski's argument, the existence

of non-industrial, underdeveloped countries in a technologically advanced world contributes to the scepticism related to the theoretical core of his argument.

Nevertheless, the tendency to emphasize one single factor has an almost irresistible attraction for historians. If historians had argued that this single factor was only one of the necessary conditions for industrialization, this would have been acceptable, but the usage goes beyond this since one factor is elavated above all others (Thompson 1973, p. 8). Furthermore, one should recognise that the single factor cannot be a prime mover in the sense of being something from which all else follows. It is well known that a number of factors may be necessary, but no factor is both necessary and sufficient. Moreover, it should be mentioned that the single-factor argument fails to include mutual interactions with other factors which were admitted to be necessary conditions for industrialization. In fact, as stated by Supple (1963, p. 35), "there was no single cause of the industrial revolution but rather a set of varied economic and social conditions which attained a rare balance sufficient to initiate the process." It is, therefore, appropriate to analyse mutual causation between the factors which influence the industrialization process.

The counter-arguments against the single-factor argument, however, should not obscure the importance of the technical improvements in the industrialization process. It seems difficult to deny the central role of technical change during the transition period from an agrarian to industrial society. This is particularly true in the twentieth century when the growth of tested knowledge, both scientific generalization and empirical information, and of the modern technology based on it, have increasingly become necessary conditions for the industrialization and the development of nations.

3. Regional Concentration of Industrialization

Contrary to the almost axiomatic assumption that the political boundaries of nations are the only units within which the industrialization process occurs, some writers such as Pollard (1990; 1982) and Kemp (1985) argue that industrialization was a very uneven

process geographically, and it is a regional phenomenon, at least at the beginning. It would, therefore, be better to look at British and European industrialization on a regional or a Continental basis without taking into account national frontiers.

Pollard (1990, p. 6) defends the regional pattern of industrialization with the following words: "Industrialization in fact took place in every country on a regional basis, and a regional typology, could it be developed, might well yield more information than can be derived from the larger national units."

While in Pollard's analysis industrial concentration is used mostly as an analytical tool to explain the early start of British industrialization, Kemp's use of this device helps him to concentrate on the comparisons between British and Continental industrialization experiences in the nineteenth century.

According to Kemp (1985, p. 29), "during the nineteenth century European industrialization tended to be mainly a regional phenomenon and the transformation of whole national economies remained less complete than in Britain." Incomplete formation of modern national economies and slow industrial transformation led to regional concentration of industrialization especially in nineteenth century Continental Europe. As to Kemp (1985, pp. 29-30), "...industrialization was simply a regional phenomenon and the creation of modern national economies, although going on, was still far from complete. In one sense, then, what can be stressed about the Continent is the incompleteness and geographical patchiness of the industrial transformation compared with Britain." But "by comparison with the rest of the world, Europe was the area of advanced capitalism par excellence" (Kemp 1985, p. 30).

Pollard (1982, p. 41) also reaches similar conclusions by saying: "Western Europe was a single community within which circumstances might give rise to similar results and industrial growth was essentially a local rather than a national affair."

Furthermore, regional concentration of industrialization provided many advantages for nineteenth-century European countries such as decreasing transport costs, improving goods and factor markets, easy

access to natural resources, together with technical and institutional changes (Pollard 1990, p. 6).

It should be stressed, however, that the regional approach to industrialization has certain weaknesses. First of all, this approach is constrained by the nineteenth century. Secondly, it does not present a pattern of industrialization for the countries or regions "out of area" (e.g. Japan and U.S.). Finally and most importantly, since it does not take the national frontiers as a unit of account, it becomes impossible to measure and compare the macro-economic aggregates such as GNP, NNP and taxes which are the key variables in the national income accounting framework. This last shortcoming makes it also difficult to test the validity of the approach since most of the data are available on a national basis.

Nevertheless, the regional factor should not be altogether ignored. It imposes a caution in interpreting the national character of the industrialization process in certain countries. While in some countries like Belgium, the industrialization process may have proceeded in a similar way in almost all of the regions within the national boundaries, in others such as Austria-Hungary, Germany and Russia, misleading conclusions may be drawn from purely national information about the characteristics of a country's industrialization process due to the existence of large undeveloped regions.

4. "Stages" Approach

As is well known, Rostow (1960) divides the process of economic development and/or industrialization into stages. The initial stage is the "traditional society", followed by the "preconditions stage" where the qualifications for industrialization are gathered and will lead to the crucial stage, namely that of the "take-off". The preconditions stage can be summarized in the following way: i) transformation of agriculture (agricultural revolution) which will bring an increase in productivity freeing the surplus labour, food and raw materials for the use of industry; ii) transformation of transport (transport revolution) which will allow supply and demand to interact quickly and efficiently; iii) foundation of an effective banking system; iv)

presence of risk-taking entrepreneurs; v) minimum level of skilled labour and energy resources; vi) improvement in the exploitation of domestic raw materials or increase in the import of foreign ones.

The fulfillment of these preconditions will push the economy to the "take-off" stage. In this stage, the manufacturing sector grows rapidly, the proportion of productive investment in the national income will double within two or three decades and the major industries within the economy will grow to form "leading sectors". After the accomplishment of the "take-off", the economy will reach "maturity" where industrial growth is sustained. And once industrial growth has become sustained, the economy will move to the final stage which he called "high mass consumption".

The main objective of Rostow is to analyse the transition of the traditional economy to a mature economy, that is to say the transition that led to a sustained increase in per capita income, not the existence of this transition *per se*. In interpreting the "stages" approach, Fishlow (1965) argues that there are, in fact, two theories of take-off in Rostow. At one level, take-off is a sectoral, non-linear, threshold notion, and at the other level, it is highly aggregative (Fishlow 1965, p. 113). This argument is implicitly shared by Cannadine (1984, p. 154) and Hartwell (1967, pp. 14, 16-17) as well.

According to Fishlow (1965, p. 113), the aggregative level is related to the familiar Harrod-Domar growth theory in which the growth rate of income is the product of an average propensity to save and inverse to a stable capital/labour ratio. Therefore, the take-off stage consists of a major discontinuity in the growth of per capita income which means a sharp increase in the saving rate.

But unfortunately, such a discontinuity cannot be found in the works of Kuznets (1966; 1963, p. 55) which draw up data for Japan, Sweden, Germany, Britain, U.S. and Canada. Kuznets describes these countries as being hardly blessed with respect to saving rates at the begining of their growth processes and gradual increases with respect to per capita incomes. A similar argument is stated by Trebilcock in the following way: "For the early developers, modern researches insist

that industrial growth was gradualistic, evolutionary, achieved not in the violent spontaneous outburst of revolution, but in the long run (Trebilcock 1981, pp. 2-3)."

Furthermore, in analysing and comparing French and British economic growths, O'Brien and Keyder (1978, p. 19) point out that there was no take-off stage in France and Britain in terms of discontinuity in the rate of capital formation and the emergence of leading sectors which push the economy to a level of sustained growth.

On the other hand, as stated by Fishlow (1965, p. 115), recently compiled data for Italy and Denmark fit very well into Rostow's aggregative model. Since both groups attain more or less the same level of industrial growth, Rostow's aggregative model does not seem suitable as the explanation of the transition mechanism.

The sectoral level of take-off can be summarized by the following propositions of Rostow (1960, pp. 34-36):

1) A limited number of industries can be the source of discontinuity in the production of manufactures;

2) Leading sectors influence the economy by backward, lateral and forward linkages;

3) The development of subsidiary activities such as coal and machinery contribute to the extension of industrialization;

4) Instead of agricultural growth, industrial growth constitutes an initial base for sustained growth.

It can be said that the sectoral level of take-off supports the proponents of "unbalanced growth". The central point at this level is the leading sector's use of most advanced technology which yields higher productivity - probably in newly-established industries. It is also assumed that the diffusion of the new technology throughout the economy must be regular and reasonably rapid. Of course, backward and forward linkages are crucial in this process. But such linkages have not been established by research and are difficult to identify and separate chronologically (Hartwell 1967, p. 16).

As a result, the sectoral level of take-off requires further quantitative research to evaluate and qualify its fundamental implications. Contrary

to the aggregative level, however, the sectoral one offers much more fertile discussions to the process of industrialization.

Meanwhile, one cannot ignore the drawbacks of Rostow's model. According to Hartwell (1967, p. 16), "the greatest problems of the stages analysis are first, the difficulty of rigorously defining the characteristics of each stage; second, of dating transition from stage to stage; and third, of describing the mechanism whereby the transition from stage to stage is achieved."

On the other hand, Trebilcock (1981, p. 5) points out the inconsistency between rapid growth and orderly progression and asks "how can rapid growth be derived from limited resources?"

Furthermore, Rostow's approach does not explain the industrialization process itself, but at best sheds lights on the transition process from an agricultural to an industrial economy.

Finally, the most criticized feature of the model is its uniformity. It assumes that every country will go through a similar pattern of industrialization no matter what the starting point is. But differences in initial conditions may alter the course of the process. In other words, the model does not consider the starting point of industrialization on the one hand, and it envisages a "similar" and "linear" pattern of industrialization for every country on the other. One can, however, easily observe deviations and dissimilarities in the industrialization experiences of each country. In the actual world, as Trebilcock said, there tend to be "substitutes" for Rostow's preconditions (Trebilcock 1981, p. 7).

5. Degree of Economic Backwardness

Gerschenkron's approach to industrialization primarily deals with the degree of backwardness, and it can be said that the emphasis is given to the beginnings of industrialization rather than its long-term objectives.

Gerschenkron's hypothesis is that the initial spurt of industrialization experienced by a number of European countries was systematically related to their "degree of relative backwardness" (relative to the country or countries that had already experienced

industrialization) at the beginning of their spurts (Supple 1963, p. 40; Sandberg 1982, p. 675).

Industrialization and the modernization of the limited number of European countries (especially Britain) in the nineteenth century, which increased the relative backwardness of the other European countries, created a sharp divergence between actual and potential economic conditions in the backward countries. Gerschenkron describes this situation as an increased "tension" between reality and possibility. The degree of economic backwardness is positively related to the ensuing tension which could be released in the form of an industrial spurt. The industrial spurt reveals itself as an upward discontinuity in the backward country's industrial growth (Gerschenkron 1966, p. 8). At this point, it should be noted that Gerschenkron's approach features a style of economic advance no less discontinuous and no less rapid than that envisaged by Rostow. In fact, economic growth is designed to "leap" out of backwardness (Trebilcock 1981, p. 9).

Gerschenkron's approach depends heavily on two interrelated concepts, namely "the advantages of backwardness", and "the substitutability of preconditions". Nothing as sophisticated as the Rostowian preconditions are postulated in Gerschenkron's approach. True, certain preconditions of industrial growth are missing in the backward countries which prevent their industrialization. The recognition of relative backwardness, however, forces the country to foster industrialization by making innovative substitutions for missing preconditions. At this level, backward countries can use the already accumulated experience of advanced countries in the form of technical assistance, importation of capital-intensive techniques, foreign investment etc. to substitute the missing preconditions. The greater the degree of relative backwardness, the greater will be the number of missing preconditions and, therefore, the more resourceful the country needs to be in order to find innovative substitutions.

The general assumption of the model can be simply stated as: the greater a country's backwardness, the more rapid will be its industrial development.

A number of hypotheses are suggested, however, to deal with more specific aspects of the industrialization process: The greater a country's relative backwardness, (1) the more rapid the subsequent rate of manufacturing growth; (2) the greater the emphasis on the scale and size of plant and enterprise; (3) the greater the stress on producers' goods as opposed to consumers' goods; (4) the less rapid the increase in the level of consumption; (5) the greater the role of special institutional factors designed to speed industrialization; (6) the smaller the agricultural sector's contribution to economic growth in terms of the rate of increase in agricultural labour productivity; (7) the greater the reliance on technological and financial borrowings abroad (Gersechenkron 1966, pp. 353-354; Barsby 1969, p. 449; Gregory 1974, p. 656; Sandberg 1982, p. 676).

In the literature, there have been several attempts to test empirically some hypotheses about relative backwardness in a variety of countries.

Barsby's pioneer study in this area focuses on the testing of the first, the third and the sixth hypotheses for the six European countries.[1] Before doing the tests, Barsby dates the beginning of spurts and ranks the countries according to their relative backwardness prior to the great spurt. In order to make international and inter-temporal comparisons, he needs to find a unit of measurement for relative backwardness. Of the units of measurement suggested by Gerschenkron (1966, p. 44), only per capita income seems to be appropriate to Barsby. But due to the difficulties of using per capita income for international comparisons[2], he prefers to add two independent variables which are the percentage of labour employed in the agricultural sector and the lateness of spurt as a measure of backwardness (Barsby 1969, p. 453). And he finds a high degree of consistency between the rankings of different measures of relative backwardness. Furthermore, two alternative time periods (ten and

[1] The countries in question are France, Germany, Denmark, Sweden, Russia and Italy.

[2] Barsby (1969, p. 452) particularly refers to the difficulties related to the reliability of the data and the conversion of per capita income statistics into a common unit.

twenty years) are used for relating the characteristics of industrialization to relative backwardness.

If the unit of measurement for relative backwardness is taken as lateness or share of labour in the agricultural sector, there appears to be a positive relationship between relative backwardness and the subsequent rates of manufacturing growth. There is, however, no significant relationship between relative backwardness as measured by per capita income and the rates of growth in manufacturing (Barsby 1969, p. 456). Therefore, it can be said that the first hypothesis of Gerschenkron is emprically valid, depending on the definition of relative backwardness.

For the third hypothesis, Barsby (1969, p. 458) finds a positive relationship between relative backwardness and the stress on producers' goods, on condition that this is interpreted as the share of producers' goods achieved prior to the spurt. On the other hand, if it is defined as the growth rate of the share of output belonging to producers' goods, the relationship is rather weak and not significant at all (Barsby 1969, pp. 457-458).

The tests related to the sixth hypothesis fail to support a negative relationship between the rate of increase in agricultural labour productivity and relative backwardness (Barsby 1969, pp. 457-458).

Another writer, Gregory, attempts to test some hypotheses of relative backwardness as they apply to Russian industrialization. Interpreting differently the first hypothesis above, he tests the positive relationship between the product share of heavy manufactures and relative backwardness. He ranks the contemporaneous countries (more or less developed than Russia) according to their product share of heavy manufacturing and takes per capita income as a unit of measurement to classify relative backwardness. As a result, he finds a negative relationship between the product share of heavy manufacturing and relative backwardness (Gregory 1974, pp. 658-660).

Moving to the second hypothesis, Gregory, first of all, interprets Gerschenkron's reasoning in postulating this hypothesis. According to Gregory (1974, pp. 661-662), Gerschenkron's emphasis on large-scale enterprises is mostly related to the adoption of capital-intensive factor proportions as a substitution dictated by the

conditions of relative backwardness, since relatively backward countries generally suffer from qualitative and quantitative shortages of industrial labour. Starting from this point of view, Gregory tries to identify (indirectly) the heavy industry bias in Russia by considering Russia's industrial labour force. Gregory argues that the growth rate of the Russian industrial labour force during the period of the great spurt was rapid by international standards. The qualitative nature of the Russian industrial labour force, however, was inferior in terms of education when compared with the U.S. labour force at that time (Gregory 1974, p. 663). But qualitative differences, according to Gregory (1974, p. 663), could not be a justification for the adoption of capital-intensive methods of production. In short, Gregory claims that Russian industry did not suffer from severe shortages of industrial labour which could have led to the adoption of capital-intensive factor proportions and consequently, emphasis was not given to heavy industry during the spurt period in Russia (Gregory 1974, p. 665).

In testing the seventh hypothesis of relative backwardness for Russia, Gregory (1974, p. 664) finds that the role of foreign capital was much more important in Russia than in other countries. But since he is not sure whether Russian industrialization was relatively more or less dependent on foreign capital inflows, he neither rejects nor accepts the hypothesis.

Also, Crafts briefly analyses Gerschenkron's hypotheses for nineteenth-century European countries by looking at the results of some correlation tests. The number of countries varies from one test to another depending on the availability of data. The minimum sample contains seven and the maximum fourteen countries.[3] First of all, Crafts ranks the countries by variables in terms of their value at an income level ($550) labelled as "initial industrialization", and then, by time in terms of reaching that particular income level, with the first country (Great Britain) taking the value 1, etc.

[3] The list of the countries is as follows: Great Britain, Belgium, Denmark, Germany, Netherlands, France, Austria, Sweden, Norway, Hungary, Finland, Portugal, Italy and Spain.

For the first hypothesis, Crafts finds no correlation between the growth of industrial output or the growth of coal consumption and relative backwardness (Crafts 1984, p. 455).

By looking at the relationship between the level of investment expenditure and relative backwardness, Crafts implicitly tests the third hypothesis and finds an inverse correlation (Crafts 1984, p. 455).

On the other hand, a correlation test associated with the fourth hypothesis indicates a negative relationship between the level of private consumption and relative backwardness (Crafts 1984, p. 455).

For the sixth hypothesis of Gerschenkron, Crafts investigates the relationship between the share of primary labour and backwardness on the one hand, and the sectoral productivity gap and relative backwardness on the other. He finds a positive coefficient of correlation for both relations (Crafts 1984, p. 455).

Crafts also finds a positive relationship between the school enrolment ratio and relative backwardness for nineteenth-century European countries (Crafts 1984, p. 455). But he does not attempt to evaluate this finding within the framework of Gerschenkron's approach. Meanwhile, the central theme in Sandberg's study on the theory of relative backwardness can be associated with the above finding.

Sandberg (1982) provides an alternative measure of economic backwardness by decomposing backwardness into *ignorance* and *poverty*. By ignorance, Sandberg refers to low levels of per capita human capital and by poverty, to low per capita income. In explaining the rationale for this division, he stresses first of all the difference between the effects of ignorance and poverty on the speed and the character of industrialization and then points out the considerable variations in the ranking of the countries (especially nineteenth-century European countries) depending on whether ignorance or poverty is used to measure backwardness (Sandberg 1982, p. 678).

At the beginning of his article, Sandberg analyses Gerschenkron's hypotheses by making the distinction between poverty and ignorance (Sandberg 1982, pp. 681-687). Consequently, by ranking the countries

according to their adult literacy rates - assuming that these rates are a good index of per capita human capital stocks - Sandberg compares the income levels of the countries with their levels of human capital. With a very few exceptions (e.g. Russia), he finds a positive relationship between the levels of income and the levels of human capital (Sandberg 1982, pp. 690-696).

As a result, he argues that, although the low level of per capita income represents an opportunity for the industrialization of the country, the lack of human capital is a serious constraint in this process since the rapid increase in domestic production and/or the large-scale importation of human capital are very inefficient compared with augmenting output through increased inputs of physical capital.

As the above empirical analyses indicate, it is not an easy task to test the hypotheses of relative backwardness. The difficulties arise, first of all, as to the interpretation of the hypotheses. Every writer seems to test and evaluate the same hypothesis in a different way. For instance, to test the first hypothesis, Barsby uses three different measures of relative backwardness and then looks for the relationship between "rates of manufacturing growth" and relative backwardness. On the other hand, Gregory attempts to test the same hypothesis by investigating the relationship between the "product share of heavy manufactures" and relative backwardness, taking per capita income as a unit of measurement for relative backwardness. Crafts also tests the same hypothesis by looking at the correlation between "industrial output growth or the growth of coal consumption" and relative backwardness.

Thus, every writer uses a variety of variables to test the same hypothesis, while taking different units of measurement for relative backwardness. The formation of a common unit of measurement, therefore, seems to be critical in order to synchronize and evaluate different test results related to the hypotheses of relative backwardness.

The second point is that it is not possible to quantify some of Gerschenkron's hypotheses. For example, how can one measure quantitatively "the role of the institutional factors designed to speed industrialization"?

As a result, it can be argued that Gerschenkron's approach to

industrialization envisages a very rapid and discontinuous economic advance similar to Rostow's model. But, as Supple (1963, p. 45) pointed out, in the process of linking economic backwardness to rapid industrialization by heavily depending on the advantages of late-comers, Gerschenkron produces an "explanatory system of considerable ingenuity".

Contrary to the "stages" approach, the characteristics of the initial spurt seem to be the crucial point in Gerschenkron's way of analysing the industrialization process. Furthermore, particular features of each country have been taken into account, and therefore, uniform patterns of industrialization have not been implied by Gerschenkron.

Meanwhile, it should be noted that the transmission mechanism of development from early developers to late-comers, which worked so well in the nineteenth century, is now seriously damaged, and that the new international and financial system prevents an optimistic view about fostering industrialization in the backward areas of the world.

6. Conclusion

This paper has attempted to make a survey of the industrialization process in a historical perspective. Emphasis is given to the experiences of industrialization by European countries in the nineteenth-century. In doing so, various typologies of industrialization have been considered, together with their empirical implications.

With every typology, the industrialization process in Europe is explained in alternative ways. It should be mentioned that the typologies examined in this paper do not reveal a complete picture of industrialization with no time and space constraint, but shed light on various aspects of it in a historical context.

Furthermore, empirical researches associated with the cited typologies do not present reliable and consistent results in testing the validity of the approaches. This shortcoming also prevents an evaluation of historical experience which would shed light on the path of industrialization for the developing countries of the twentieth century.

In this respect, the need to solve the statistical problems related to the quantitative researches is obvious. For this, consistent and

reliable international historical statistics should be constructed and extensively used on the one hand, and common units of measurement should be agreed on the other. Put differently, quantitative research should be conducted in a compatible way, and should be synchronized to evaluate various test results.[4]

Besides the statistical deficiencies, it should be stated that the typologies analysed in this paper do not totally fit the modern industrialization process. But at least they constitute a historical basis for a future research agenda.

In this context, the major characteristics of modern industrialization should be identified accurately, taking into account historical trends, and then, "patterns of industrialization" should be ascertained with no "time" and "space" constraint. Such an effort seems to be more fruitful for considering both the industrialization performance of the early developers and the new developing countries of our own age.

[4] O'Brien (1986, pp. 330-333) also points out the same problem in a different context.

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