

Relative Prices and Technical Change: A Suggested Approach to Long Waves

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Over the last decade there has been an increasingly widespread feeling that conventional static economic theory is unable to offer a convincing analysis of the evolution of economic systems and reliable proposals for remedies to the situation of stagflation. As a consequence, in the last five or six years there has been renewed interest in the analysis of long waves described by Kondratieff (1926, 1928), which were consigned to oblivion after World War II. As early as 1913 Pareto wrote a paper, taking France as an example, which sketched very clearly the argument that the world economy was characterized by long-term oscillations. The idea was that a study of long-term tendencies, or the forces and mechanisms that shape and govern them, would help in answering in a more satisfactory way the questions posed by the real world.

Before suggesting a framework for analyzing long waves, I discuss the existence of Kondratieff cycles themselves, since many economists question them both on statistical and more general grounds. The latter claim that long waves are nothing more than historical episodes that correspond to different stages in the evolution of capitalism as a result of external forces rather than internal mechanisms. It is interesting to note that this argument was put forward at the same time as the pioneering contributions by Kondratieff were published (see Day, 1976). This is certainly a serious objection, and it is difficult to make the case for one position or the other. I think that there is no need (even if it were possible) to settle the matter on *a priori* grounds because we can adopt the Kondratieff intuition as a temporary working hypothesis, leaving it to researchers to judge whether or not simple mechanisms can be found that are consistent with long waves. Meanwhile, it is worth exploring the consequences of adopting the hypothesis in terms of the light that may be shed on the workings of the capitalist system. This procedure has the advantage of helping to establish a dialogue between historians and

economists on a topic that certainly needs a joint effort in order to be dealt with satisfactorily. It is clear that the longer the period under examination, the more difficult it is to find (or extract) a set of general laws that apply to different nations at different stages of development; but on the other hand some regularities and similarities can be detected and should be studied carefully. In this case what is left unexplained could well be the peculiar elements that can be understood and clarified with the help of a detailed historical analysis.

There is also the statistical debate (see Soper, 1975). The main reason for the lack of agreement among scholars is that, in comparison with the length of the cycle to be detected, the available times series are too short to apply spectral analysis, and the elimination of the trend is often a doubtful procedure. My position is as follows. I distinguish (following Kondratieff himself) between long waves in prices and in physical production. Whereas the existence of the latter is much in doubt, the former is widely recognized. It is often stated that, unless it can be proved that the economic system does oscillate in real quantities as well, the long-wave hypothesis must be totally rejected. I do not share this view. First, long waves in output can be detected at least for some countries and for world production (Bieshaar and Kleinknecht, 1984). Second, something more can be said about price movements. As Rostow (1978) has forcefully argued, oscillations in the terms of trade between manufactured goods and raw materials can be detected in the evolution of the capitalist economy. More precisely, he showed the existence of alternations in the value of the ratio between the price of commodities produced in the industrial sector and the prices of raw materials and foodstuffs. Accordingly, one can distinguish in world history roughly five periods in which foodstuffs and raw materials prices increased with respect to those of manufactured commodities (A-periods), and four periods where the opposite held true (B-periods). The periodization chosen by Rostow is as follows (A-periods only): I, 1790–1815; II, 1848–1873; III, 1896–1920; IV, 1936–1951; and V, 1973– ... If Rostow's chronology is accepted (and I think it should because it is statistically sound) one is in search of a set of elements that account for such a pattern and the corresponding movements in production (see Rostow 1960, 1979, 1980).

Thus it is clear that of the various scholars, I have some sympathy for Rostow's approach. This is not to deny validity of the analyses of Schumpeter (1939, and his followers), Mandel, Forrester, Freeman, etc. I have simply chosen a general view common to the one shared by Rostow and at the same time offer some considerations on a mechanism that could be important in shaping economic evolution. I do not want to discuss and criticize Rostow's arguments since my purpose is to offer something which, building on Rostow's intuition, is (I hope) less unconvincing. The model put forward by Rostow and Kennedy (1979) omits many interesting elements like unemployment, oligopolistic markets, and endogenous technical progress. It would be highly desirable to construct a model that captures all the important elements, but that task is beyond my ability. I therefore outline a set of elements that could make up a picture, drawing partly on previous work by Di Matteo and Ruiz (1986).