

# THE KONDRATIEFF WAVES AS GLOBAL SOCIAL PROCESSES

**William R. Thompson**

*Department of Political Science, Indiana University, USA*

**Keywords:** Long waves, economic growth, systemic leadership, global war, technology, change, Kondratieff

## Contents

1. Introduction
  2. Long Waves of Economic Growth and Their Correlates
    - 2.1. The Price (+) Route
    - 2.2. The Schumpeterian Path
    - 2.3. The Very Long Path
  3. Other Lines of Inquiry
  4. Conclusion
- Glossary  
Bibliography  
Biographical Sketch

## Summary

Long waves of economic growth (Kondratieff or K- waves) are important carriers of change. Radically new technology is introduced in pioneering economies, and then diffused unevenly elsewhere. These changes in the technological frontier, its geographical location and the primary beneficiaries also have major impacts on international power hierarchies and domestic politics and culture. Three main types of approaches to interpreting Kondratieffs are reviewed. The one with the longest history emphasizes long-term price fluctuations. A second one, often linked to Joseph Schumpeter, focuses on intermittent bunching of economic innovations, and its implications. The third approach pushes back the origins of Kondratieff waves to Song China in the 10<sup>th</sup> century and the subsequent migration of modern economic growth impulses first to Northern Italy, then to the Atlantic rim of Eurasia, before crossing the Atlantic to North America. This third approach also stresses the international political-military implications of technological change. A sampling of other types of interpretations are also noted briefly before conclusions on the significance of Kondratieff or K-waves are summarized.

## 1. Introduction

Kondratieff waves are critical to world social processes because these long waves of economic growth are a primary vehicle for long-term and fundamental, technological change in the world economy. Intermittent clusters of radical innovation extend the technological frontier and revolutionize the way things are done in advanced economies. These clusters of innovations are generated in a single economy, the system's lead economy, and subsequently diffused unevenly to other economies. The lead economy, however, moves to the top of the technological gradient and reaps the benefits of

pioneering new commerce and industries. The ensuing destabilization of the economic hierarchy has led to a period of global war that results in a victory by the coalition led by the lead economy and an opportunity to create a new, postwar, political-economic order.

Kondratieff waves, therefore, are primary motors in shaping global political and economic power structures. They also influence a variety of other processes, including energy demands, a variety of political processes such as realignment, public moods, and conflict and more general processes such as generational change. As basic motors of change, Kondratieff waves are highly pervasive and influential in affecting a wide range of social processes – both globally and locally. It might be optimal for social science if there really were a few variables that determined human behavior. Yet human behavior defies deterministic explanations because it is simply too complex for even a handful of variables to completely explain everything that we might wish to know. That does not necessarily imply, however, that some variables and processes are no more important than any other in accounting for behavior. One outstanding candidate for exceptional explanatory significance is that of long waves of economic growth, sometimes referred to as Kondratieff waves – or even more simply as K-waves.

Their explanatory potential does not rely on a natural law that says long-term economic activities must possess a rough, fifty year periodicity. But, over the past millennium, a number of economic (and other) processes have come to be characterized by long waves of upswing and downswing. Why that might be the case continues to be debated but the most likely explanation has to do with the tendency of innovations to come on line in clusters and to do so with finite life cycles before their innovative nature become more routine.

Yet there is more at stake than mere innovation bunching. Successive iterations of radical innovation bunching have structured the world economy that, in turn, influences in a non-deterministic way a number of other activities. Radical or fundamental innovations have altered and continue to alter how the world economy functions. Modern economic growth appears to have been initiated in Song China in the tenth century, migrated to the Italian city states, and was then assumed by a sequence of states on the Atlantic edge of Western Europe before moving across the Atlantic to the United States. Long Kondratieff waves of economic growth have been a principal rhythm in this process. In the process of shaping the nature of economic growth, Kondratieff waves have propelled the world economy through eras in which commercial, industrial, and, now, post-industrial activities have predominated at the technological frontier. Each Kondratieff wave has served to push that frontier and the complexity of the world economy one step further, with a host of implications for other processes. For these reasons, it is argued that long waves of economic growth possess a very strong claim to central significance in the social processes of the world system.

K-waves are hardly part of the mainstream quiver of explanatory arrows. Their very existence is questioned. Yet K-wave influences seem extraordinary and all-pervasive. Given their great potential for explanatory significance in contemporary human behavior, we might do well to keep in mind Gordon's Kondratieff wager. Playing off Blaise Pascal's take on the existence of God, Gordon argues that if there is such a thing

as the Kondratieff long wave and we ignore it, our explanations will suffer immensely. If there is no such thing as a Kondratieff long wave and we proceed as if there were, at best, we will be stuck with some misinterpretations of long-term patterns. Better, then, for at least some of us to proceed as if there might be long waves and look for their existence and impacts than to dismiss them out of hand.

Accepting the Kondratieff wager in this essay, the argument is that long waves of technological change, roughly 40-60 years in duration, help shape many important processes, such as those specified in Figure 1. They have not always been critical. Nor need they be significant forever. Rather, they have become increasingly influential over the past thousand years. K-waves have become especially critical to an understanding of economic growth, wars, and systemic leadership – this author’s main concerns. But they also appear to be important to other processes such as domestic political change, culture, and generational change. This list may not exhaust the significance of Kondratieff waves but it should help establish an argument for the importance of long waves to the world’s set of social processes – hence, the K-wave should be viewed as a major global social process.

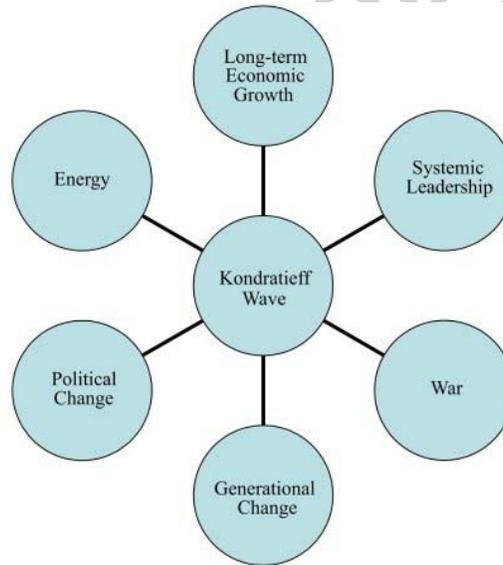


Figure 1. The Kondratieff Wave’s Centrality to a Number of Social Processes

The principal interest here lies in making the broader significance of the Kondratieff process, as opposed to attempting a conventional and comprehensive survey of the relevant literature. That literature is over a century long, often focuses exclusively on economic processes, and possesses a number of tangents and complexities that need not concern us at this time. A secondary objective is to simplify some of the basic themes. The richness of the Kondratieff literature, accordingly, is restricted to three types of approaches: 1) an emphasis on long-term price fluctuations, 2) an emphasis on the economic implications of clustered or bunching innovations, and 3) an emphasis on the broader, global, political-economic implications of long-term fluctuations in economic growth. In each emphasis, a few examples are relied upon to illustrate the types of arguments and evidence that are appropriate. In emphasis one, the work of N.D.

Kondratieff and Joshua Goldstein provide the focus. In emphasis two, the approaches of Joseph Schumpeter and Christopher Freeman’s Sussex School are highlighted. The leadership long cycle perspective, which provides the core of the argument on the centrality of the Kondratieff, is the armature for emphasis number three. Nonetheless, K-wave significance does not hinge on accepting the assumptions associated with one or another perspective. Part of the argument is that a number of analysts operating within a number of perspectives converge on the critical role(s) of the K-wave.

## 2. Long Waves of Economic Growth and Their Correlates

There should be no question that world economic growth is intermittent. There are decades of relatively positive growth and there are decades of relatively negative growth. Table 1 captures some of this propensity by identifying eras with higher and lower growth rates. The post-1945 years have the highest growth rates although grouping 1973-2001 is misleading because average growth rates were higher in the 1950s and 1960s than they were in the 1970s, 1980s, and 1990s. The interwar years and the years prior to 1870 were the relatively bad years of the contemporary era. Note that these eras are not randomly interspersed. Nor are good years always followed by bad years or vice versa. Instead, there are clusters of years in which growth is relatively fast and clusters of years in which growth is relatively slow.

Years	Growth Rates
1820-1870	0.54
1870-1913	1.30
1913-1950	0.88
1950-1973	2.92
1973-2001	1.41

Note: The numbers are annual average compound growth rates.

Table 1. Rates of Growth of World GDP Per Capita

Why might this be the case? There is no single answer; nor should there be. For most people, wars are not conducive to economic growth and thus warfare is one of the obvious and usual culprits. Under the right conditions, postwar rebuilding can stimulate economic growth so that gives warfare both a direct and an indirect role. Some of the “right” conditions include expanding trade, increasing interdependence, and international institutions that facilitate expanded trade. Then, too, attention is often drawn to declining transaction costs as the technology underlying trade is improved to work more quickly and less expensively. New industries that stimulate demand and supply also can contribute to periods of economic expansion while their routinization as well as the over-supply associated with too many producers of similar products attempting to move into the same markets can contribute to periods of slow economic growth. As a consequence, and perhaps not too surprisingly, world economic depressions tend to start in one place – in economies such as the United States or Britain – and diffuse unevenly outwards to the rest of the world.

All of these processes related to economic growth have at least three common denominators. They all are linked to (1) technological change that (2) tends to come in

waves or clusters and (3) tends to be innovated primarily in one economy at a time. The process of economic growth that emerges from these tendencies takes the form of long waves of relatively productive years that are interrupted somewhat irregularly by troughs of relatively bad years of economic growth. The process is also characterized by an epicenter in that one economy takes the lead in economic growth by assuming the primary responsibility for generating the innovations that fuel the spurts of radical technological change. Some parts of the world economy are able to imitate, absorb and even improve on the innovations. To the extent that they can, these economies can close the technological gap between the sophistication of their own economic activities and that of the system's lead economy. To the extent that they cannot, the economies in question tend to fall farther behind.

One convenient label for the central process at work is the Kondratieff wave – sometimes shortened to K-wave. Most people are quite familiar with business cycles that tend to be denominated in terms of months. Sales are good, people are confident about the future, and unemployment is reduced. Then sales fall off, the immediate future seems gloomier, and unemployment increases. The Kondratieff wave is a longer version of economic fluctuation, albeit with the added trait of initial spatial concentration and subsequent diffusion at the world level. It also has some rather major implications for war, peace, and order in the world system that conventional, short-term business cycles lack. Therefore, the K-wave is a core component part of the most significant processes of the world system. Precisely what drives K-waves has been the subject of considerable analytical dispute. Arguments have been advanced that bestow main driver status on investment, profits, population growth, war, agricultural-industrial tradeoffs, prices, and technological innovations. This debate has by no means been settled but at this time the emphasis on technological changes appears to be the best bet.

For purposes of simplification in this essay, there are at least three basic ways to view Kondratieff wave phenomena. One is the price (+) route in which long-term fluctuations in prices are considered the core or at the core of the processes involved. A second path might be termed the Schumpeterian approach. It focuses primarily on production since the Industrial Revolution. The third path, one linked to the leadership long cycle perspective, overlaps with the second one but pushes the temporal reference point back in time some 800 or so years before the British Industrial Revolution. By no means do these three avenues of conceptualization represent everything that has been said about Kondratieff waves. But then there is no way to capture everything that has been said in one brief essay. Tracing the three paths should serve to sketch the main features of the Kondratieff landscape in an introductory format given that the main intent is to promote a broader view of K-wave processes.

-  
-  
-

**TO ACCESS ALL THE 22 PAGES OF THIS CHAPTER,**  
Visit: <http://www.eolss.net/Eolss-sampleAllChapter.aspx>

## Bibliography

- Berry, B.J.L., E. Elliott, E.J. Harpham, and H. Kim (1998). *The Rhythms of American Politics*. Lanham, Md.: University Press of America. [This is a representative analysis of domestic political change processes thought to be influenced by long waves such as political realignment and generational change].
- Boswell, T. and C. Chase-Dunn (2000). *The Spiral of Capitalism and Socialism: Toward Global Democracy*. Boulder: Lynne Rienner. [ This analysis constitutes one updating of the world-system approach to long waves].
- Devezas, T.C. and J.T. Corredine (2001). “The Biological Determinants of Long Wave Behavior in Socioeconomic Growth and Development.” *Technological Forecasting and Social Change* 68, 1-57. [This article argues that long waves are based on biological life-cycles].
- Freeman, C. (1996). *Long Wave Theory*. Cheltenham, UK: Elgar. [This edited volume offers a Collection of articles on long wave phenomena].
- Freeman, C. and F. Louca (2001). *As Time Goes By: From the Industrial Revolution to the Information Revolution*. Oxford: Oxford University Press. [This book criticizes the development of economic theory and provides a descriptive history of technological changes of the past two centuries].
- Freeman, C. and C. Perez (1988). “Structural Crises of Adjustment, Business Cycle, and Investment Behavior,” in G. Dosi, C. Freeman, R. Nelson, G. Silverberg, and L. Soete, eds., *Technical Change and Economic Theory*. London: Pinter. [This book chapter represents a concise overview of the Sussex School’s approach to long waves].
- Goldstein, J. (1988). *Long Cycles*. New Haven, Ct.: Yale University Press.[This book offers a comprehensive survey and synthesis of theoretical and empirical long wave analyses].
- Kondratieff, N.D. (1935/1979). “The Long Waves in Economic Life.” *Review of Economic Statistics* 17: 105-15 or *Review* 2: 519-62. [This paper summarizes the early perspective of Kondratieff].
- Modelski, G. and W.R. Thompson (1996). *Leading Sectors and World Politics: The Coevolution of Global Politics and Economics*. Columbia: University of South Carolina Press. [This work offers a 1000 year perspective on economic long waves originating in Song China and continuing through the United States in the 21st century].
- Nakicenovic, N. (1991). Diffusion of Pervasive Systems: A Case of Transport Infrastructure,” in N. Nakicenovic and A. Grubler, eds., *Diffusion of Technologies and Social Behavior*. Berlin: Springer-Verlag. [This study offers a specific focus on energy transitions from a long wave perspective].
- Perez, C. (2002). *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages*. Cheltenham, UK: Elgar. [This book represents the most recent set of innovations in the Sussex school’s approach to K-waves].
- Reuveny, R. and W.R. Thompson (2004). *Growth, Trade and Systemic Leadership*. Ann Arbor: University of Michigan Press. [This study extends the leadership long cycle perspective on long waves to questions of economic growth and trade protectionism].
- Schumpeter, J. (1939). *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*, 2 vols. New York: McGraw Hill. [This study advances Schumpeter’s perspective on economic long waves].
- Suter, C. (1992). *Debt Cycles in the World Economy: Foreign Loans, Financial Crises, and Debt Settlements, 1820-1990*. Boulder, Co.: Westview. [This work offers an analysis of one of the spin-off effects of economic long waves, intermittent debt crises in the global South].

## Biographical Sketch

**William R. Thompson** is Rogers Professor of Political Science at Indiana University, Bloomington, USA. He is a past President of the International Studies Association (2005-06). Recent publications include *Puzzles of the Democratic Peace* (with Karen Rasler, 2005) and *Globalization and Global History* (with Barry Gills, 2006). Forthcoming books focus on strategic rivalries, the evolution of war, and North-South political economy.