

Introduction

Kondratieff's Mystery

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Academic careers of leading scientists may develop in very different ways. Some get recognition quite fast and easily, some get it towards the end of the life; some die in obscurity but get posthumous fame; some are only remembered a hundred years after their death. However, there is a category of scientists that leave after them a mystery that many others try to solve for many years, decades, or even centuries afterwards. For two thousand years mathematicians tried to prove the Fifth Postulate of Euclid. For three hundred years they were haunted by Fermat's Last Theorem. There are a number of such examples. And the persistence demonstrated by scientists is not coincidental, for the discovery of the mysteries of harmony, be in nature or in the social life is the main goal of science.

The Russian economist Nikolay Dmitrievich Kondratieff (*Николай Дмитриевич Кондратьев*) left after him a mystery that has been haunting economists and social scientists for almost a hundred years. Joseph Schumpeter named this mystery 'Kondratieff Cycles'. Why do we observe such regularity in long-term fluctuations of economic and non-economic indicators? Why in certain periods do we observe prolonged upswings, whereas in other periods – notwithstanding all the enormous efforts of interested macroeconomic actors – economic development is accompanied by prolonged depressions? What gets out of order in social and economic mechanisms? Since the publication of Kondratieff's seminal works a number of outstanding researchers have made significant contributions to our understanding of various factors affecting and provoking long-term fluctuations of human economic affairs. On the other hand, it has become more and more clear that K-waves influence many social-related processes. However, nobody appears to have found yet an entirely satisfactory solution of 'Kondratieff's mystery', and it continues to attract researchers. It is especially important to solve this mystery, as this could extend our forecasting horizons. In any case, whatever the future destiny of Kondratieff's mystery will be, its immense importance resides in the fact that it stimulates scientific studies of numerous researchers.

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Kondratieff's life (like the lives of many other outstanding personalities) reflects both, the peculiarities of a particular epoch and the universal human drama of creative people. This struggle for ideas is always unique in every particular case; however, one can often detect certain similarities as new ideas rarely get recognition without significant difficulties.

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Nikolay Kondratieff was born on the 17th March, 1892 in the village of Galuevskaya, Kostroma Governorate, into a peasant family¹. He was the eldest among ten other children of his parents. After he had finished his primary school, Nikolay entered a church-teachers training seminary where he befriended Pitirim Sorokin (who later became a world-famous sociologist). This friendship continued throughout their life; in addition, until Sorokin's emigration they were tied together by political activities. During the First Russian Revolution (1905–1907) Nikolay joined the Party of Socialists-Revolutionaries, with which he remained connected for many years; he became deeply involved in revolutionary activities. As a result he was expelled from the seminary and had to go to Ukraine, where he continued his education. In 1908 he decided to study in Saint Petersburg and in 1910 he entered the Department of Economics of the University Faculty of Law. Nikolay attended classes of such brilliant scholars as Mikhail Tugan-Baranovsky, Maksim Kovalevsky, Leon Petrażycki and others; he continued contacts with them long after the graduation. Nikolay soon started his own research and in 1912–1914, while still being a student, he published more than 20 articles, reviews and other works. In 1915 he graduated from the University with a diploma of the First Grade. The same year he published his first monograph which was met with positive reviews in the academic press. The talented graduate was left to work in the University. In the same time he worked as the Head of Statistics Department of the Petrograd Zemgor.²

During all those years Nikolay continued to be actively involved in illegal revolutionary activities; in the revolutionary underground he got to know a number of future imminent politicians, including the ones belonging to the Bolshevik Party. It is not surprising that since the first days of the February Revolution Kondratieff took an active part in those stormy events as a member

¹ Depicting Kondratieff's biography hereinafter we use the following works: Simonov and Figurovskaya 1991, 1993; Yakovets 2002; Blagikh 1993, 1994; Efimkin 1991; Gorbunov and Shutov 1994; Abalkin 1992. We have used also 'Letters of N. D. Kondratieff to E. D. Kondratieffa (1932–1938)' (Kondratieff 1991b [1932–1938]); Curriculum vitae of N. D. Kondratieff (*Idem* 1991a) and others materials.

² Zemgor (*Земгор* or *Объединённый комитет Земского союза и Союза городов*; literally *United Committee of the Union of Zemstvos and the Union of Towns*) was a Russian organization created in 1915 to help the government in World War I effort.

of the Party of Socialists-Revolutionaries. The year 1917 was the peak of his political carrier. In October 1917 at the age of 25 he became a Deputy Minister of Supply in the Provisional Government of Alexander Kerensky. However, he occupied this position just for a few days. Everything changed with the Bolshevik Revolution of October 1917. After it Kondratieff continued his political activities for some time, but he finally stopped taking any active part in politics after the dissolution of the All Russian Constituent Assembly in January 1918. He moved to Moscow where he served as an economist in various state departments, combining this activity with teaching.

1918 was a tragic year; it was a turning point in the Russian history. Kondratieff hardly published any academic research that year.³ On the other hand, he established contacts with a number of well-known economists (Alexander Chayanov, the founder of modern Peasant Studies, was one of them). Chayanov invited Kondratieff to head the Laboratory of Agrarian Conjuncture in the Institute of Agrarian Economics and Politics that he organized in 1919. In October 1920 the Macroeconomic Conjuncture Institute was established on the basis of the laboratory and Kondratieff was appointed its director. He also continued his teaching activities. In the early 1920s the Bolsheviks abandoned their policy of so-called Military Communism (which implied a direct coercive extraction of resources from peasant households) and introduced the New Economic Policy (NEP); in connection with this the Soviet authorities employed Kondratieff for work over the identification of the optimum norms of peasant taxation, and later over the five-year plan of agricultural development. He also studied the issues of cereal crop prices and trade and entered the civil service as the Head of the Agrarian Economics and Political Administration of the People's Commissariat (= Ministry) of Agriculture.

That was the first time after October 1917 when he was arrested. That was a grim signal, revealing the real attitude of the Communist power toward such intellectuals as Kondratieff. However, this imprisonment had no serious consequences, for Kondratieff apparently considered it as a mere mistake. There were evident grounds to think so. His carrier went up; in 1924 he was even allowed to undertake a long trip abroad together with his wife. He visited Germany, Britain, Canada, and the USA. It was during this trip that he met for the last time his old friend Pitirim Sorokin; Pitirim suggested that Kondratieff could get a position as departmental head in one of the American universities. Yet, Kondratieff declined this offer, as he believed that his place was in Russia. Though Kondratieff made a number of successful forecasts, he could not forecast his own fate ...

³ In 1918 he published only two politically motivated texts. One of them had a rather symptomatic title – ‘On the Way to Famine’ (Kondratieff 1918a), the other's title was ‘The Year of Revolution from an Economic Point of View’ (Kondratieff 1918a).

In the six-year period between 1922 and 1928 all main works of Kondratieff containing really new ideas appeared. A renowned scholar of Kondratieff's life and research, Yuri Yakovets notes: 'his market analysis, his system of indexes, his academic research paved new ways of deep economic analysis, it got a wide recognition both in our country and abroad' (Yakovets 2002: 711).

Among his rather numerous publications we would single out the following: *The World Economy and its Conjunctures during and after the War* (Kondratieff 1922); a book on Tugan-Baranovsky (Kondratieff 1923); the article 'Concepts of Economic Statics, Dynamics and Conjuncture' (Kondratieff 1924); the article 'Long Cycles of Economic Conjuncture' (Kondratieff 1925); the report 'World Economy, 1919–1925: Current State and Main Development Trends' (Kondratieff 1926c) and his seminal article 'The Problem of Foresight' (Kondratieff 1926b); finally, he published also the article 'Critical Notes on the Plan of National Economic Development'



From left to right: Nikolay Kondratieff, his wife, Pitirim Sorokin's wife, Pitirim Sorokin, 1924, USA

and a separate issue of *Long Cycles of Economic Conjuncture* (Kondratieff 1928, based on the materials of 1926 discussion, see below).⁴ Kondratieff's views on long waves (as well as on other problems) faced rather tough criticism on the part of Soviet economists. He noted himself in one of his letters from the prison to his wife that his publications 'provoked storms' (Kondratieff 1991b [1932–1938]: 541).

The year 1926 was marked with a famous discussion on the issue of 'big cycles' where a number of prominent Soviet economists acted as Kondratieff's opponents.⁵ This discussion marked a sharp turn in Kondratieff's academic career and influenced definitively his fate. Kondratieff's presentation *The Long*

⁴ A considerable number of Kondratieff's works have been translated into English (see, e.g., Kondratieff 1935, 1984, 1998, 2004).

⁵ This discussion was organized in February 1926 in the Institute of Economics of the Russian Association of Social Science Institute with Dmitry Oparin as Kondratieff's principal opponent.

Cycles of Economic Conjunction (Большие циклы конъюнктуры) as well as his final word contained the essence of his views on the nature and mechanisms of the long wave dynamics. Kondratieff's ideas were confronted with a sharp critique on the part of his opponents. Note that this critique could be only partly explained by the toughening political and ideological pressure in the country. It was also explained by the unusualness of some Kondratieff's ideas, as well as by some rather complex techniques applied by Kondratieff in order to detect long waves in the dynamics of various indexes. Indeed, in certain respects Kondratieff's methodology was not quite perfect, and in certain aspects criticism of his opponents was quite objective. However, as happened quite often in the history of science, the opponents failed to see wider perspectives beyond smaller defects. The arguments of Kondratieff's opponents did not shake his position; till the end of his life he was sure about the importance of his forecasts. There was a certain irony in the fact that he could see the confirmation of some of his ideas while already being in prison. In 1934 he wrote in one of the letters to his wife: 'I try to follow the course of the world economic development (as much as I can get relevant data from the press), and I think that some of my ideas and forecasts that are based on them have been successfully tested and joined the fund of recognized facts...' (Kondratieff 1991b [1932–1938]: 546).

Kondratieff's analysis concentrated on value-dominated statistical series, that is, money, production, trade and wages. They do not move necessarily with the same periodicity as other driving factors of the economy, but they provide a 'thermometer' to measure the 'heat' of economy (prices), which move in phase with other series and essentially reflect the underlying forces in a capitalist economy, rising and falling with supply and demand. In other words, Kondratieff's ideas that a capitalist economy is subjected to periodic fluctuations did not please in any way the communist economists, for it implied that the economic crisis which then approached (and worsened in the 1930s) would be just another provisional oscillation of the capitalist economy, and not its ultimate demise as the Bolsheviks theorists wanted to see. This was the true origin of the contradiction between Kondratieff and his opponents, and Kondratieff refused to deny his ideas, as they were based on very robust empirical evidence.

The present short biographic sketch is not an appropriate place to analyze Kondratieff's ideas in any detail – this has already been done elsewhere – starting from the works of Schumpeter (1939) and Kuznets (1940). Kondratieff published his research on a rather wide range of topics. However, in the history of the world economic thought he will remain above all as the economist that launched the theory of long economic cycles (with a characteristic period of 40–60 years) that manifest themselves in a number of very important economic and physical indicators.

Though many contradictions still exist regarding the details and regularity of these long-term fluctuations of the global economy, it is hard to deny the fact

that these fluctuations have happened all along the last two centuries, or even in earlier periods. Kondratieff was, perhaps, wrong in certain respects, though some of the eliminations that he applied to his graphs in order to demonstrate the presence of the long waves are far from being fully justified, his main discovery remains intact.

Copernicus believed that the orbits of the planets around the Sun have round shapes; later Johannes Kepler demonstrated that the shape of those orbits was elliptical. However, this did not make Copernicus' discovery less revolutionary. The redshift velocity has turned out to be much higher than was believed by Edwin Hubble, but this does not undermine the validity of Hubble's law and the birth of the idea of the Big Bang. Kondratieff launched the seeds of today's burgeoning evolutionary economics that permeates the general conception of the World System as a self-organizing complex system that moves forwards at the edge of chaos, out of equilibrium, subjected to typical limit-cycle oscillations. Kondratieff could not have imagined this 'complexity' that arose from the fluctuations that he detected, as well as Copernicus could not have imagined Newton's law that governed the regularity of the planetary movements that he had detected, or Hubble could not have imagined today's 'dark matter' theory that was developed to explain the apparently never ending expansion of the universe that he has once detected.

The year 1927 was actually the last real year of the New Economic Policy in the USSR. 1928 marked the end of the period of rather limited economic freedom and it is correlated with the catastrophic shrinking of the minimum creative freedom that was still left for the intellectuals, including the possibility to travel abroad, to have contacts with foreign scientists, to get published abroad. It was within these rather limited possibilities that the world happened to know about Kondratieff long wave theory, for he managed to publish a number of his works in European languages within the narrow 'opportunity window' open to him at that time – first of all, 'Die langen Wellen der Konjunktur' in *Archiv für Sozialwissenschaft und Sozialpolitik* (1956 [1926]: 573–609).

Stalin and the new clique of the Bolshevik leaders headed to the most rapid industrialization and militarization. Such a forced industrialization could only be carried out through a radical increase in the gross fixed capital formation, through the acquisition of huge amounts of modern machinery and industrial equipment. In order to do this Stalin needed enormous sums of hard currency, and to get this currency it was necessary to radically increase volumes of wheat exports. Wheat was also necessary to supply basic needs for the fast-growing urban population (including the fast-growing 'working class'). The Soviets/Stalin refused to buy wheat from peasants at normal prices, whereas it was impossible (and actually suicidal) for peasants to sell wheat at prices lower than standard market prices. This created a sort of deadlock for the Bolsheviks.

In order to escape from it they headed to the coercive expropriation of the peasants land to transform them into a sort of state's slaves. Peasants were forced to enter 'collective farms' that had to sell agricultural products at a token price. The radical transition in this direction began in the fall of 1929. However, this was preceded by fierce battles within the Communist Party leadership, which, naturally, involved a significant part of the expert community of that time. The aim of that struggle was not only to determine the course of the further movement of the country; this was also a struggle for power – and so it was extremely fierce. Kondratieff was one of its victims – in addition to, say, numerous other economists who did not want to become Stalin's academic slaves whose academic reputation was supposed to be used in order to strengthen the authority of the Soviet power to perform total coercion over the people.

Such economists then became an obstacle with all their ideas about the stimulation of peasants' economic initiative, optimum (not forced!) industrialization, decreasing the burden of taxation, and so on. Efficient hard working farmers were called *kulaks* – this word denoted the 'class enemy' in the countryside. In 1927 the ideas of Kondratieff and his colleagues were proclaimed 'Kulak Party Manifesto' (this was the title of an article published by one of the Bolshevik leaders, Zinoviev, in the *Bolshevik Magazine*). Kondratieff felt an ice breath of execution, for it was evident that his political position could cost him freedom and even life.

In 1928, Stalin, Molotov, and Kaganovich crashed the so-called 'Right-Wing Faction' within the Soviet Communist Party (headed by such veteran party comrades as Bukharin, Rykov and others); independently minded agrarian economists and sociologists were repressed simultaneously. On May 1, 1928, Kondratieff was fired from the Conjunction Institute, and the institute itself was closed down soon afterwards. Kondratieff continued his formal academic research for two more years, but he had already fallen into disgrace with the Soviet authorities, and he could hardly publish anything. One could imagine his psychological distress, all those feeling of oppressive clouds that were thickening over him. However, still greater sufferings were awaiting him. The year 1929 became known in the official Soviet historiography as 'the year of the great turn', or 'the year of the great break'. Millions of peasants were coerced to join collective farms, they were robbed of their lands and livestock; hundreds of thousands of the most efficient farmers (*kulaks*) were stripped of all their possessions and evicted to inhospitable areas of Siberia, European North, and Kazakhstan, where a very high proportion of them starved to death. The 'collectivization' led to catastrophic failures in the Russian agriculture and widespread famine, but Stalin's administration tried to maneuver. They tried to avoid social explosions and to blame the others for Stalinists' failures. It was necessary to invent such enemies to be blamed. One of such invented enemies was the so-called 'Labor Peasant Party' that never existed in reality but was fabri-

cated by the Joint State Political Directorate (Soviet secret services). Almost all the independently minded agrarian economists and sociologists were accused of being active members of this fictitious party and arrested. Nikolay Kondratieff was one of them – he was arrested in June 1930. The trial of the ‘kulak-professors’ was finished in 1932 and Kondratieff was sentenced to eight years of prison. He was imprisoned in Suzdal, in a building of one of Suzdal monasteries that was turned into a political prison (called at that time ‘political isolator’).

During all his years in prison Kondratieff continued to work (as far as this was possible) on his book that was published (many decades afterwards) under the title *Main Issues of Statics and Dynamics in Economics* (*Основные проблемы экономической статики и динамики*). However, Kondratieff's health and moral conditions deteriorated very fast; his letters provide the best evidence on this point. In late 1932 he wrote (one cannot exclude, however, that the text was somehow influenced by his fear of censorship): ‘The Suzdal Political Prison makes an impression of a rather well-organized and civilized custodial’ (Kondratieff 1991b [1932–1938]: 535). However, two years later the contents of his messages changed in a rather significant way. Kondratieff still tried to keep up, but quite often he was in despair. For example, he wrote: ‘It is impossible to do anything really serious in prison’ (Kondratieff 1991b [1932–1938]: 546). ‘This is a place where the human life and thought is the most devalued value’ (*Ibid.*). However, when despair went, he continued to work. Yet, terrible conditions and isolation took their toll. Kondratieff's health deteriorated, he felt physical weakness that decreased dramatically his capacity for intellectual work. The prison regime became tougher and tougher, and nutrition worsened. However, the psychological desire to work remained and Kondratieff continued his struggle; he still hoped to get amnesty or a reduction of sentence.

In 1937 he spent a few months in the prison hospital; doctors detected four serious diseases; in addition his sight weakened dramatically. As a result, he felt neither energy nor desire to continue his studies (Kondratieff 1991b [1932–1938]: 558). All the remaining forces were spent in order to struggle with diseases. ‘The mood is *very and very* upset and strained... There is something wrong with my head. Continuing weakness... From time to time I feel attacks of enormous depression, despair, and disease’, – he wrote in July 1938 (*Ibid.*: 560). But even in such a condition he continued to read. Reading, as he wrote, ‘no doubt counteracts the disease’ (*Ibid.*: 561).

While he was suffering and struggling with his illness in Stalin's political prison, while the dissemination of Kondratieff's ideas was strictly prohibited in Russia, his ideas still started the life of their own. In 1929 Wesley Mitchell in a new edition of his *Business Cycles* allotted quite a few pages to the discussion of Kondratieff's work on long wave dynamics (Mitchell 1929: 231–235);

Mitchell's discussion was positive and the author came to the conclusion that Kondratieff's work had opened promising perspectives for future research (*Ibid.*: 234). In late 1934 Kondratieff's morale was greatly supported when he happened to read a part of Fisher's article dedicated to the analysis of his ideas. In 1935 a short version of his article 'The Long Wave in Economic Life' was published in English in the *Review of Economics and Statistics* (Kondratieff 1935). Joseph Schumpeter, a famous Austrian-American economist, got rather interested in Kondratieff's theory and this had especially important consequences to the posterity.

Mikhail Bulgakov, a famous Russian writer and Kondratieff's contemporary (whose fate was also rather tragic) wrote in those years: 'Manuscripts do not burn'. He meant that really creative works can never be entirely silenced, and that really creative ideas should become known sooner or later (note that Bulgakov's novel containing the above-mentioned phrase was published only a few decades after it had been written, well after Bulgakov's death). Just in that very period when Kondratieff felt 'the inexorable advent' of his fate (Kondratieff 1991b [1932–1938]: 541) and despair from the sense that all his efforts had been dissipated pointlessly (Kondratieff 1991b [1932–1938]: 560), his ideas started to acquire immortality. It is interesting to note that the rather terrifying atmosphere of those years contributed to the positive reception of Kondratieff's long cycle theory. The world was quaking with economic crises, depressions, unemployment, stock exchange crashes and their concomitants. There was a need of new ideas and theories that could explain the unusually long depressions and stagnations. That was the time when a new economic science formed by such great economists as Keynes, Kuznets, and Schumpeter. Kondratieff's theory took its place among these new emerging ideas.

In the USSR the state terror reached its apogee. In 1937 and 1938 thousands of talented intellectuals, artists, writers, and scientists were executed or tormented to death. Special measures were taken with respect to those who were already in prison, who were about to go out of prison. Nobody really intended to give them freedom. Instead, authorities tried to invent new cases, new accusations resulting in death sentences – they were usually announced as 'ten years in prison without the right of correspondence', but the convicted people were executed almost immediately after the announcement of their sentences, whereas his or her relatives for ten poignant years still hoped to see the prisoner alive. On September 17, 1938, Nikolay Kondratieff was sentenced precisely to 'ten years in prison without the right of correspondence'. That meant: he was shot by a firing squad the same day.

This was the end of the life of political prisoner Kondratieff, but the life of scientist Kondratieff entered its new phase. In 1939 Joseph Schumpeter published his famous *Business Cycles* (Schumpeter 1939). In this monograph

the economic long waves were denoted as 'Kondratieff cycles'. No doubt that Schumpeter's work has influenced the posthumous interest in Kondratieff's life and ideas in a rather significant way. That time (the 1930s) was an epoch of great interest in the study of economic cycles. But for almost three decades, the issue of the Kondratieff long wave in economics remained in a kind of limbo, probably obfuscated, ironically, by the grand economic expansion and ebullience of the 1950s and 1960s forecast by the self same Kondratieff wave. It was not until the 1970s that a revival of long waves emerged, mainly due to the systematic works of Gerhard Mensch (1979), Ernest Mandel (1980), Jay Forrester (1978, 1981), and a research team at IASA (International Institute for Applied Systems Analysis, Laxenburg) led by the physicist Cesare Marchetti (see, e.g., Marchetti 1983). It is very curious to note that the interest in the phenomenon of economic long waves seems to move itself as long waves, as demonstrated by Devezas and Corredine (2001) – these authors have measured two long waves in publications on long waves, a first one centered in 1927, and a second one centered in 1986, exactly 59 years after the first burst of publications.

Only in the 1980s K-waves started being discussed in Kondratieff's homeland. In 1987 Kondratieff was formally 'rehabilitated' (together with all the other his colleagues of him who were sentenced in the framework of the case of the 'Labor Peasant Party'). One could observe then a wave of publications of Kondratieff's works as well as publications about him and his ideas going through the country (Kondratieff 1988, 1991a, 1993b, 1993c; Menshikov and Klimenko 1989; Poletayev and Savelyeva 1993; see also a special issue of the *Voprosy ekonomiki* Journal [No 10, 1992]). His ideas received a new impulse.

Why We Need the Kondratieff Almanac

Though Nikolay Kondratieff has received a deserved recognition, there are quite a few researchers in the world who continue the study of Kondratieff cycles. There are a very few academic organizations specialized in K-wave research, and there are no specialized journals. Even the last edited volume specially dedicated to the K-wave studies appeared more than five years ago (Devezas 2006). That is why we have decided to establish a special almanac *Kondratieff Waves*. It is not coincidental that its first issue appears in 2012. The 17th of March, 2012 was Nikolay Kondratieff's 120th anniversary; 2012, is also the year of the 90th anniversary of the publication of his *Mirovoye khozyaistvo i ego conyunktury vo vremya i posle voiny* [The World Economy and its Conjunctures during and after the War] (Kondratieff 1922) where he first spelled out the idea of long cycles, which later became known as Kondratieff cycles, or Kondratieff waves (or just K-waves). As was already mentioned above, since that time the issues of mechanisms generating economic long waves (cycles), the causes of the regularity of the alternation of Kondratieff up-swings and downswings, and the relative stability of the K-cycle period became

very interesting subjects for many researchers in the field of economics and social sciences. Essentially the studies of the K-wave dynamics became a special field of interdisciplinary research and, of course, this suggests an immense importance of the further research on the K-wave phenomenon that has been already observed for a few centuries (if not millennia).

Notwithstanding all the substantial advances in the study of those dynamic waves, there is no consensus among the K-wave students with respect to a number of the most essential points. They include such questions as:

- How many K-waves have been observed until the moment?
- Were there Kondratieff waves prior to the 18th century Industrial Revolution?
- What is the K-wave periodization?
- Which variables should be used for the detection of the K-waves?
- Which spheres of social systems experience K-wave dynamics?
- Is this only the economic subsystem? Or could the K-wave patterns be also traced in political, cultural, and other subsystems?
- Are there any spheres of social life that experience no K-wave dynamics?
- What are the factors of the K-wave dynamics? Which of those factors are the most important?
- At what phase of the K-wave is the World System at the moment?
- May the K-wave pattern have been destroyed by globalization, or even on the contrary, is the pattern stronger now?

It is quite clear that a deeper understanding on the nature of long waves can provide us with an important tool for the forecasting of social and economic macrodynamics.

We believe that to form conditions for qualitative advances in the study of causes, mechanisms, and patterns of various K-wave manifestations we need to develop cooperation and interconnection between various students of the long cycles. One of the steps in this direction may be constituted by a new almanac that will have *Kondratieff Waves* as its permanent title, whereas every issue of it would have its own subtitle, dedicated to a specific theme. This edition is in no way an organ of an established group of scholars. Contrary to this it invites all the students of Kondratieff waves to a free discussion of the relevant problems, from all the possible points of view. In general, we expect that the Almanac will publish first of all theoretical articles dedicated to the study of K-waves in general, to their various manifestations, to their interconnections with various economic, political, cultural, and social cycles and phenomena. We would also be glad to publish various review articles dedicated to those problems, book reviews, information on conferences and other academic events on the long cycle theme.

The leading subjects of this Almanac are supposed to be as follows:

- Kondratieff waves in economic, social, political, and cultural dynamics both at national and global level;
- economic crises and K-wave dynamics;
- mechanisms of K-wave dynamics;
- technological backgrounds of Kondratieff waves;
- human problems in the light of K-wave dynamics;
- futurological aspects of K-wave studies; dynamic forecasts *etc.*;
- formal models of Kondratieff waves;
- Kondratieff waves in history;
- K-waves and other economic cycles (interaction, general mechanisms, differences, *etc.*);
- philosophic aspects of K-waves.

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We dedicate this first issue to the 120th Nikolay Kondratieff's anniversary. Thus, in addition to general theoretical articles, the introduction to this issue also contains materials concerned with Kondratieff's biography and the analysis of his works.

The first issue has the following subtitle: **Dimensions and Prospects at the Dawn of the 21st Century**. The aim of this issue is to offer a wide range of views and approaches. We do not try to present a detailed history of K-wave research, which appears to be unnecessary in view of the existence of many fundamental works, as for instance Goldstein's *Long Cycles: Prosperity and War in the Modern Age* (1988).

The almanac consists of four sections.

Section 1 (*K-Waves in Global Perspective*) includes four articles.

It starts with an article by **Andrey V. Korotayev and Leonid E. Grinin** 'K-Waves in the World System Perspective'. The authors believe that the analysis of long economic cycles allows understanding long-term world-system dynamics, developing forecasts, explaining crises of the past, as well as the current global economic crisis. The article offers a historical sketch of research on K-waves; it analyzes the nature of Kondratieff waves that are considered as a special form of cyclical dynamics that emerged in the industrial period of the World System history. It offers a historical and theoretical analysis of K-wave dynamics in the World System framework; in particular, it studies the influence of the long wave dynamics on the changes of the world GDP growth rates during the last two centuries. A special attention is paid to the interaction between Kondratieff waves and Juglar cycles. The article is based on substantial statistical data and extensively employs quantitative analysis, containing numerous tables and diagrams. On the basis of the proposed analysis it offers some forecasts

of the world economic development within the next two decades. The article ends with a section that presents a hypothesis that the transition from K-wave upswing to downswing phases correlates significantly with the phases of fluctuations in the relationships between the World System Core and Periphery.

George Modelski ('Kondratieff Waves in the Modern World System') suggests that among the cascade of evolutionary processes, the K-(economic) wave coevolves not only with the political process of rise of system leaders that powers global political evolution, but also with that of global community-building, and also that of global opinion formation (via the rise of media, learning, and science) that shapes and legitimizes globalization.

According to **Stephen Ternyik** ('K-Periodicity, Space-Time Structures, and World Economics'), a methodical quantum leap towards world economic science is already in the scientific making, researching into the meta-cyclical patterns of human economic behavior. Although the monetary wave function and the banking systems structure are at the behavioral core of this quantum economic science, it is at the same time decisive to pushing methodical economic thought forward into models of curved space-time. A more exact and innovative reading of the time value of money and the temporal structure of production is needed for such a futuristic approach. It is important to note the author's suggestion to distinguish between different time scales in the economic life that strikingly resembles Fernand Braudel's ideas about the difference between *histoire événementielle* and *longue durée* (Braudel 1958).

Anttiheikki Helenius ('Waves on Waves – Long Waves on the Seven Seas') points out that the Global Financial Crisis of 2009 and the present economic situation have parallels with the Great Depression of the 1930s. Twice-in-a-century events are occurring again. On the other hand, many important innovations have been introduced during the last decades. These innovations have changed the people's lives in a revolutionary manner and have contributed very positively to the global development. Study of the development of seafaring supports the claim of the Kondratieff waves' existence. Important innovations and milestones of seafaring development have coincided with upswing phases of these waves. Moods of different eras manifest also in developments on the 'seven seas'.

Section 2 (K-Waves in National Perspective) consists of two articles. However, in future issues we intend to represent the country level of the K-wave analysis more widely.

Brian J. L. Berry and Denis J. Dean ('Long Wave Rhythms: A Pictorial Guide to 220 Years of U.S. History, with Forecasts') point out that the macro-historical rhythms which have structured the U.S. economic, social and political life since the nation achieved independence have been shaped by mode-locked Kondratieff, Kuznets and Juglar cycles. Details of this mode-locking are pro-

vided, together with the timing of the resulting upswings and downswings, recessions and depressions, technological revolutions and Menschian metamorphoses, generational dynamics and the phase structure of American political history. Using the resulting long-wave clock, predictions are made of the key turning points in the next long wave that began in the 2007–2012 Kondratieff trough.

Claude Diebolt ('Cliometrics of Economic Cycles in France') presents a cliometric application of fractional integrated processes to socio-economic time series for France in the 19th and 20th centuries. The analysis leads to a significant result: no short or long term cycle appears as the dominant constituent. As in the myth of Sisyphus, the boulder seems again to be at the bottom of the hill!

Section 3 (*Global Crisis: A K-Wave Perspective*) also consists of two articles, but this theme will be continued in the future issues of our Almanac.

Tessaleno C. Devezas ('The Recent Crisis under the Light of the Long Wave Theory') analyzes the secular unfolding of four economics-related agents, which when considered as a whole, allow comprehending what happened in the past in the global economy and shed some light on possible future trajectories. The four agents considered are: world population, its global output (GDP), gold price and the Dow Jones index. The joint action of these actors, in spite of being only a part of the whole, might be seen as a good depiction of the great piece representing the world economic realm. The application of analytical tools such as spectral analysis, moving averages, and logistic curves on time series data about the historical unfolding of these actors allows the demonstration that the recent global crisis seems to be a mix of a self-correction mechanism that brought the global output back to its original learning natural growth pattern, and that it carries also signals of an imminent transition to a new world economic order. Moreover, it is pointed out that fingerprints of Kondratieff long waves are ubiquitous in all observed time-series used in this research and it is demonstrated that the present decade will be probably one of worldwide economic expansion, corresponding to the second half of the expansion phase of the fifth K-wave.

Michel Husson and Francisco Louçã ('Late Capitalism and Neo-Liberalism – A Perspective on the Current Phase of the Long Wave of Capitalist Development') contend that the world is plunging into the second great depression of its modern history. The financial crisis provoked by the subprime market ignited a global recession in 2009 and then a new recession emerges in 2012 in Europe. Through this process, a major recomposition of the social regime of accumulation is under way. Although the concept of 'crisis' is certainly mugged, three different meanings use to be attached to it: a periodical crisis, a regulation crisis and a systemic crisis. The current period can be described by a regulation crisis but it is also a systemic crisis. The authors discuss the current phase of the long wave in late capitalism.

Section 4 (Problems and Forecasts) finishes the Almanac quite logically with a series of forecasts.

According to **William Thompson** ('Energy, K-Waves, Lead Economies, and Their Interpretation/Implications'), one approach to interpreting Kondratieff waves, associated with the leadership long cycle research program, emphasizes the role of intermittent but clustered technological innovations primarily pioneered by a lead economy, with various significant impacts on world politics. This approach is further distinguished by asserting that the K-wave pattern is discernible back to the 10th century and the economic breakthrough of Sung Dynasty China. While K-wave behavior has numerous and widespread manifestations, the question raised in this essay is whether explanatory power is improved by giving a greater role to energy and energy transitions in the K-wave process(es). Eight specific implications are traced, ranging from the interaction of technological innovations and energy to cosmological interpretations. In general, the answer to the raised question is affirmative, with one caveat on whether emphasizing new fuels and engines is a hallmark of the hydro-carbon era or a new and evolving feature of K-waves.

Carlota Perez ('Technological Revolutions and the Role of Government in Unleashing Golden Ages') concludes that the world is currently going through a recurring turning point in history. The technological potential is there to unleash a global sustainable golden age, but the political vision seems to be lacking. The future – golden, gilded or recessive – is now being defined globally and in each country. Those with a better understanding of the nature of the transition ahead are more likely to be successful.

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