

Introduction

The Cyclical Dynamics as Associated with Economic Development

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The examinations of modern economic activities mostly plunge an observer into pessimism since the disturbing and negative facts and forecasts prevail over the positive ones. The currencies devalue, profit rates fall, and the debt load increases. Besides, the global trade is hampered and the threat of economic crisis is in the air. The researchers of the theory of long and medium-term cycles are certainly worried about the economic situation. However, they understand that so far the cyclicity, no matter how hard one tried to overcome it in the 20th century (and even succeeded in some respects), remains an inevitable attribute of economic development. And Juglar's aphorism that crisis is a consequence of the preceded prosperity is still true. And if we are in the downward phase of the cycle, then it is not surprising why economy is characterized by depressive features. Most of the economic actors have to fight against these difficulties and wait until the wheel of the cycle turns us to growth again.

Although some researchers argue that Kondratieff waves can be traced in certain economic phenomena long before the 18th century, we suppose that it is just the final phase of the Industrial Revolution that created such a phenomenon as Kondratieff waves in economy (for more details see Grinin 2013). The fact is that only during the final phase of the Industrial Revolution the productive forces started to sufficiently gain a new fundamental characteristic of striving for a steady and continuous expansion (previously implemented occasionally). The development of this feature led to the emergence of various kinds of cyclical dynamics connected with limitations hindering such an expansion and attempts to overcome them. This forward movement, of course, could not be uniform, and should comply with different rhythms; their common property was the alteration of acceleration and deceleration phases caused by the exhaustion of available resources for growth, market saturation, reduced profit margins and so on.

Thus, the emergence of long Kondratieff waves (with a duration period of 40–60 years) and medium-term Juglar cycles (with a characteristic period of 7–11 years) had one common reason – the transition of production to a new de-

Kondratieff Waves: Cycles, Crises, and Forecasts 2016 5–13

velopmental pattern, that is to an extended reproduction based not just on the involvement of new resources (as it also occurred at the stage of craft-agrarian production principle), but on the expansion due to regular investments, innovations and improvements.

Even before the Industrial Revolution the economy would far from always develop uniformly. On the contrary, during some periods it would grow while during other periods it would stagnate, and wars, internal shocks and disasters would bring economic collapses. But one can hardly find any regularity in these fluctuations, apart from the secular social demographic cycles including the phases of social and demographic catastrophes (see, *e.g.*, Nefedov 2003, 2005, 2007, 2008; Turchin 2007; Grinin 2007; Korotayev 2006, 2007; Korotayev *et al.* 2010; Nefedov 2004; Korotayev *et al.* 2006; Turchin and Nefedov 2009). But they were mainly manifested in supercomplex agrarian societies, such as China or Egypt and besides even there these cycles were far from regular.

In the 18th century some regularities started to show up. One should remind the reader that a certain precursor of the middle-term cycles can be observed in the 18th century, especially in its second half with approximately a ten years' deviation (see Hansen 1959; Braudel 1992: 270; Grinin 2013; Grinin *et al.* 2016). In 1763, the crisis broke out in Hamburg in the situation of the currency depreciation during the Seven Years' War, but then as a result of the huge bankruptcy of the Neufville brothers in Amsterdam this crisis acquired a pan-European character (Wirth 1877; Braudel 1992). Then there was the crisis of 1772–1773, which took place against the background of severe crop failures in 1771 and 1772 and, similar to the previous crisis, involved a large bankruptcy of the Cliffords in December, 1772 (which became the detonator to the collapse). Finally, the crisis of 1780–1783 obviously strengthened by the military events of the period (including military blockade of the coast of Holland from England), also acquired a large scale after another huge bankruptcy – of the Van Faerelinks in 1780 (see Braudel 1992). However, after that the crises became frequent and occurred every three or four years. Thus, one can mention the crises of 1787–1788, 1793, 1797, 1803. But these crises became mostly transitional from trade-financial to trade-industrial crises and mainly occurred at the upswing A-phase of the 1st K-wave.

The crises of 1810, 1815 and even 1819 were mostly associated with Napoleonic wars and post-war conversion. But the crisis of 1825 happened already in peace-time and against the background of seemingly good economic situation. In 1825 the character of economic crises changed. Different from the local crises in cotton industry in the end of the 18th and early 19th century, they became general, that is they would involve almost the whole national economy. Unlike the past trade and credit crises they caused industrial modernization (which implied the crisis recovery by means of technological updating), and gradually they transformed into industrial and trade crises. Besides, these crises

generated industrial and trade cycle and, therefore, are called cyclical crises. They began to repeat with frightening regularity that is why they would be characterized as periodic ones.

The previous crises of general economic decline, as a rule, resulted from an apparent disaster or depletion during war or would burst out after a sharp transition from war to peace time as it was observed in Great Britain after 1815. In this regard the most significant difference of the crisis of 1825 was that it happened in peacetime and generally within a favorable situation of economic and trade recovery. In other words, the reasons of that crisis were unclear (thus, special parliamentary commissions were arranged to determine the causes of crisis).

This crisis (1825) revealed the vulnerability of industrial economy which failed to fully realize its reserves, since during each cycle a considerable part of capital, commodity and financial resources would be eliminated in order to forcibly restore the balance in the situation. This fluctuation between contradictory aspirations of the society to stability and balance, on the one hand, and to development, on the another, had as its consequence a kind of spiral development (in more detail about crises see Grinin and Korotayev 2009).

Later, the crises would happen in the English economy (as well as in other countries' economies) with a noticeable regularity of 10–11 years. As a result, this particular regularity turned the key to understand that crises are not the result of external shocks or crop failures (since both them could only contribute to the emergence or strengthening of the crisis). It became clear that crises are only one of the phases of the economic cycle and the more rapid was the development at the expansion and prosperity phases, the more unexpected and drastic was the crisis capturing the economies similar to a disease suddenly affecting an organism. At the beginning of the 20th century the nature of the business cycle became clearer. In the 1930s, Keynes developed a scheme of countercyclical policy which was successfully implemented in the second half of the 20th century.

Despite the fact that the Keynesian economy was implemented at least starting from 1946, in 1970 – the first half of the 1980s the western world entered the period of crisis and recession. Some economists still consider as quite unclear both the causes of the crises and the high growth rates in the previous decades. For example, the Nobel Prize winner Paul Krugman in his monograph stated that the reasons of the economic slowdown in the beginning of the 1970s 'still remain to a certain extent mysterious' (Krugman 2009: 57). They would seem mysterious if one does not take into the long wave dynamics when at the downswing phases the number of crises and recession years is larger than at the upswing phases (see Grinin and Korotayev 2014; Grinin *et al.* 2016). While the exceptionally rapid growth rates ('economic miracles') in a number of European countries and Japan as well as in other countries (in particular, in the USSR and socialist countries) and in the whole world which were observed

over two decades (from the beginning and mid-1950s to the end of 1960) could be explained by the fact that, first, they occurred at the upswing phase of the 4th K-wave and secondly, they overlapped with the beginning of the Cybernetic Revolution (which was called then a scientific-technological one; about the Cybernetic revolution and its correlation with A-phase of the 4th K-wave see Grinin 2013; Grinin L. and Grinin A. 2015), then the crises of the 1970s and 1980s are explained by the fact that the wheel of the long cycle turned round. As always, the slowdown of the growth rates had the same reason with the economic cyclicality. The fact that the slowdown of rates in the 1960s would later transform into a deep crisis of the 1970s was explained generally by the transition of the 4th K-wave from its A-phase to B-phase. Such threshold crises have always been severe, and besides, the A-phase of the 4th K-wave was extremely turbulent. Thus, the leading economists' disregard of the long wave dynamics deprives them of the opportunity to perceive the major reasons of important economic phenomena caused, in particular, by the alternation of upward and downward trends within K-waves, while for the researchers of long wave dynamics these causes are quite evident.

Between the 1980s and 1990s the Keynesian receipts were replaced by the neoliberal and monetarist ones which seemed to be miraculous as well. But in fact it was forgotten that their efficiency is observed against the background of the upward phase of the 5th K-wave. The depletion of the growth was marked with the largest global crisis of 2008 which also showed that within globalization when regulation in the international arena is impossible yet, there recur the signs of Juglar cycles of the 19th and first half of the 20th centuries with their uncontrollable upwards and sharp declines evolving into collapses and panic. At present we witness the downward phase of the 5th K-wave. This is supported by the fact that for eight years the world has been at the depressive phase (except for a number of expanding economies which also began to slow down). This shows the importance if the study of cyclical dynamics and its peculiarities which can help to better cope with economic fluctuations.

The articles of the first section of the Yearbook ('Cyclical Dynamics and Theories') are devoted to different approaches and some peculiar issues of the studies of cyclical dynamics in global and national economies.

In their contribution **Leonid E. Grinin, Andrey V. Korotayev, and Sergey Yu. Malkov** ('A Mathematical Model of Juglar Cycles and the Current Global Crisis') present a verbal and mathematical model of medium-term business cycles (with a characteristic period of 7–11 years) known as Juglar cycles. The model takes into account a number of approaches to the analysis of such cycles. In the meantime it also takes into account some of the authors' own generalizations and additions that are important for understanding the internal logic of the cycle, its variability and its peculiarities in the present-time conditions. The authors argue that the most important cause of cyclical crises stems from strong structural disproportions that develop during economic booms. These are

not only disproportions between different economic sectors, but also between different societal subsystems; at present these are also disproportions within the World System as a whole. The model of business cycle proposed by the authors is based on its subdivision into four phases:

- the recovery phase (which could be subdivided into the start sub-phase and the acceleration sub-phase);
- the upswing/prosperity/expansion phase (which could be subdivided into the growth sub-phase and the boom/overheating sub-phase);
- the recession phase (within which one may single out the crash/bust/acute crisis sub-phase and the downswing sub-phase); and
- the depression/stagnation phase (which we could subdivide into the stabilization sub-phase and the breakthrough sub-phase).

The article provides a detailed qualitative description of macroeconomic dynamics at all phases. It specifies driving forces of cyclical dynamics and the causes of transition from one phase to another (including psychological causes). A special attention is paid to the turning point from the peak of overheating to the acute crisis, as well as to the turning point from the downswing to recovery. The authors suggest that the current crisis turns out to be rather similar to classical Juglar crises; however, there is also a significant difference, as the current crisis occurs at a truly global scale. Yet, due to this truly global scale of the current crisis, the possibilities of regulation with the national state's measures have turned out to be ineffective, whereas the suprastate regulation of financial processes hardly exists. It is shown that all these have led to the reproduction of the current crisis according to a classical Juglar scenario.

In his contribution **Arno Tausch** ('Kaname Akamatsu. Biography and Long Cycles Theory') presents some facts from the biography of Kaname Akamatsu, especially the ones concerned with the model developed by Akamatsu. Tausch points that there are important links between Akamatsu's 'flying geese' model and Kondratieff's ideas. The author establishes the relationship between the economic cycle and the cycle of income convergence in the World System.

Brian J. L. Berry and Euel Elliott ('The Surprise that Transforms. An American Perspective on What the 2040s Might Bring') note that each long wave peak has been followed by a cluster of paradigm-shifting innovations that transform every aspect of work and life. The authors expect that the next peak of *c.* 2036 will also be followed by a decade-long cluster of innovatory changes in energy sources and use, artificial intelligence and robotics, widespread use of virtual realities, usage of blockchaining, and laying the foundations for a new age of exploration into and beyond the solar system.

Marco Gallegati ('Wavelet Estimation of Kondratieff Waves: an Application to Long Cycles in Prices and World GDP') applies wavelet analysis to the detection of long waves in wholesale price index for France, the UK and the US because wavelets can easily overcome most of the methodological difficulties experienced in previous methods. The advantages of using wavelet multiresolu-

tion decomposition analysis for the analysis of long waves studied by Kondratieff are manifold: 1) long wave components are easily obtainable through multiresolution decomposition analysis; 2) no preliminary correction is needed; and 3) they can handily detect cycles that are not easily visible in trending series (as it is the case of the wholesale price index in the post-WWII period). Comparisons with the chronology in the literature on long wave cycles for prices and with recent results for world GDP growth rates indicate that wavelet analysis can provide a reliable and useful statistical methodology in order to analyze the dynamics of long waves in historical time series.

Zenonas Norkus ('On Global Social Mobility, or How Kondratieff Waves Change the Structure of the Capitalist World System') notes that according to Nikolai Kondratieff's close friend, great Russian-American sociologist Pitirim Sorokin, social mobility means a change in social position of persons and groups. The change of positions of countries in the World System (WS) is one of the many varieties of social mobility. The paper discloses the implicit connection between the research agendas of Kondratieff and Sorokin, using dependency theory and Immanuel Wallerstein's WS analysis as the interface. Classical dependency theory claims the polarization of the WS into centre and periphery. Wallerstein asserts the existence of the stable semiperiphery as the 'middle class' of the WS. Drawing on the findings of the recent empirical research grounded in relational data and applying network analysis, this paper claims that the number of intermediate positions between the core and ultimate periphery in the WS is not stable. It grows with each new Kondratieff wave. This means that long economic cycles not only provide opportunities of upward mobility or threats of downward mobility for individual countries, but change the 'hierarchy ladder' itself. In the WS core and upper tier semiperiphery countries, the quantitative expansion of the 'new middle class' did not abolish the divide or mobility barriers between the top capitalist elite and those described as the 'we are the 99 %' by the activists of the Occupy movement. Drawing upon the Weberian concepts of opportunity closure and usurpation as key mechanisms of class building, the author argues that the division between CWS core and the Rest will persist, accompanied by the growth of the number of countries occupying intermediate positions in the WS along with the multiplication of these structural positions themselves. The number of these positions increases according to formula $MSP=N-2$, where MSP stands for 'middle structural position', and N is the order number of current Kondratieff wave (as of 2016, $N=5$). Instead of unconditional convergence, the future of the WS harbours the increase in numbers of countries stuck in the 'middle income trap'.

The second section of the Yearbook 'From My Perspective' includes two essays presenting original authors' approaches. Thus, **Valentina M. Bondarenko** in her contribution 'Providing the Balance of Technological and Social Changes in Real-Time Regime Plus the Economic Growth' argues and proves that the causes of the crisis in the world can only be understood through

the prism of the worldview approach. It is also stated that the problems pertaining to socio-economic and technological progress, acceleration of economic growth and formation of a new model cannot be resolved within the framework of the existing development paradigm. The author reasonably and objectively proves that the world undergoes the most difficult phase of transition from one to another development paradigm, and substantiates the possibility of proceeding to a new development paradigm. In order to realize such paradigm-oriented transition and to reach the objectively set development goal speedily, the author sets forth a proposal to develop and realize the mega-project for building a new life model and the mechanisms of its realization – that is, coordination, at each local level, between the state, societal and business interests with interests of any given particular individual. Balance of technological and social changes is a basis for transition to the new model of the economic growth.

In the second article of this section by **Stephen I. Ternyik** ('Geonomics, Energetics and the K-Paradox: A Sustainable Point of View') the author speaks about the paradox truth of the Kondratieff wave phenomenon which is translated into geonomic and energetic terms of a human survivalist rationality and morality arguing against prevailing tribalist territorialism. Energy efficiency is identified as the principal law of human systems evolution, concerning the conversion of land value/natural resources into human needs; this sustainable point of view is being extended to all economic tools of human productivity and rent or interest-seeking will be discouraged in such a social model of reality. Consequently, labor and entrepreneurship will be freed from unnecessary restrictions and can reach their full creative potential for the common good, without sacrificing private wealth, liberty and classical accounting techniques.

The third section of the Yearbook is devoted to the speeches of Kondratieff Medal laureates and includes essays on some important issues of economic science from **Elżbieta Maćczyńska** (Gold medal), **William R. Thompson** (Silver medal), and **Leo A. Nefiodow** (Bronze medal).

The last section includes Anthony Harper's Review of Leonid Grinin and Andrey Korotayev's monograph 'Great Divergence and Great Convergence: A Global Perspective' published by Springer International Publishing.

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