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THE THEORY OF LONG WAVES AND INSTITUTIONAL CHANGES: THE MEMORY OF GENERATIONS HYPOTHESIS

TEORIA DŁUGICH FAL I ZMIANY INSTYTUCJONALNE: HIPOTEZA O PAMIĘCI POKOLEŃ

Summary: The article regards the main conceptions of the long Kondratiev wave and proposes the hypothesis that connects the length of the K-wave with change of generations. According to the article's hypothesis, a major historical event (e.g. a war or a deep economic recession) that happens in a society at a given time t causes the creation of some institutions designed to mitigate the consequences of this event and avoid its recurrence in the future. With a change of generations, the historical memory about the t-event is weakening, and this leads to the erosion of mentioned institutions increasing risks of the emergence of similar events. So the article attempts to demonstrate that some problems faced by modern Western society can also be associated with the cycle described in the article.

Keywords: long Kondratiev wave, social upheaval, change of generations, erasure of historical memory, erosion of institutions.

Streszczenie: Artykuł dotyczy głównych koncepcji długich fal Kondratiewa i stawia się w nim hipotezę o związku długości fal K ze zmianą pokoleń. Zgodnie z hipotezami zaproponowanymi w artykule, ważne wydarzenia społeczne i polityczne, zachodzące w społeczeństwie w danym czasie t, powodują powstanie instytucji mających złagodzić skutki tego wydarzenia i uniknąć jego powtórzenia się w przyszłości. Wraz ze zmianą pokoleniową pamięć historyczna o wydarzeniu t słabnie, a to prowadzi do erozji wspomnianych instytucji. Zwiększa to ryzyko powtórzenia się takich zdarzeń w przyszłości. Artykuł ma więc na celu wykazanie, że niektóre problemy współczesnego społeczeństwa zachodniego (wzrost niestabilności finansowej, rosnąca korupcja polityczna, rosnące ryzyko wojen) mogą również wiązać się z cyklem długich fal opisanym w tym artykule.

1. Introduction

Although the existence of the long Kondratiev wave is not recognized by all economists, in the traditional classification it is always mentioned alongside with the cycles of Kitchin and Juglar. The Kitchin cycle lasts about 3–5 years and is often connected with inventory (or stock) cycle. The Juglar cycle is a classical cycle that lasts about 7–11 years and is connected with capital investments. Also, in this classification, the cycle of S. Kuznets is often mentioned, which has a period of 15–25 years and is related with demographic processes, and the changes in construction intensity that they caused. At last, the long Kondratiev wave has a duration of about 45–60 years and is often called technological (or innovative). The last characteristic is likely due to J. Schumpeter who emphasized the pioneer merit of N.D. Kondratiev in the study of long waves [Schumpeter 1939, p. 164], and also, in his fundamental work on business cycles, tried to relate his own theory of economic development based on innovation with the N.D. Kondratiev's theory of long waves [Schumpeter 1939].

Despite the existence of different explanations of the long wave (technologically-innovative, demographical, financial, institutional, military-political, etc.), to date the technological version can be considered as dominant. So it is no accident that some authors criticize the dominant approach in the study of the long wave (primarily, in the research of Schumpeter himself) for the lack of attention to institutional factors, and propose (see e.g. [Kingston 2006]) the institutional version of long waves explaining the long-run technological changes by legislative factors.

Our research is also based on institutional aspects of the long-wave development of the economy. However, unlike the existing institutional approach, which considers exogenous factors rather, we focus on finding endogenous factors that would also explain the length of the long-wave fluctuations. So the principal goal of this paper is not simply to demonstrate the relationship between institutional changes and long-wave dynamics. We are primarily interested in the question, why some institutions, that are important for economic growth, tend to degenerate for about 55 years. So we are trying to answer this question in revealing the relationship between the mentioned degeneration and the process associated with the change of generations and their memory.

2. The theory of the big economic cycles

2.1. The main characteristics of the long wave given by Nikolai Kondratiev

One of the first economists who researched and discovered the phenomenon of the long cycles was N.D. Kondratiev, the prominent Russian scientist who was repressed and executed in 1938 during Stalin's Great Purge.

The researchers mark that the possibility of long cycles in prices and in economic activity of about 50 years from peak to peak was already noted by W.S. Jevons in the 19th century, and in fact he cited even earlier articles; and it was the Dutch economist J. van Gelderen who in 1913 formulated the hypothesis of long cycles on the basis of systematic analysis [Ayres 1989]. However, N.D. Kondratiev was the first who examined the long waves statistically and gave their detailed description. He presented the first results of his research in 1922 and later, in 1925, published them in the work *The Major Economic Cycles*. According to the N.D. Kondratiev's study, in the long-term dynamics of the leading capitalistic countries of that period, the basic economic indicators demonstrated the certain cyclic regularity of approximately 55 years. Actually he revealed a new kind of cycles, different from that classical business cycle, which lasted about 7–11 years and was characterized by the crisis of overproduction as its principal phase.

N.D. Kondratiev's study covered the period from the era of the industrial revolution and had been based on the empirical analysis of the main economic indicators (price indices, nominal wages, government debt securities, foreign trade turnover, coal and gold production, iron production) for the most economically developed countries such as Great Britain, Germany, France and the USA [Kondratiev 1989]. In general, according to N.D. Kondratiev' calculations, for the period of the beginning of the 1920s the world capitalism experienced the two and half big cycles: from 1789–1814 to 1841–1843 (the first wave), from the middle of the 19th century to 1890–1896 (second wave), and from the end of the 19th century to the 1920s (upswing phase of the third wave).

N.D. Kondratiev formulated the four so-called "empirical correctnesses". According to the first one, on the eve of the upswing phase of the big cycle or at the very beginning of it, the whole capitalist economy is undergoing the profound changes which are primarily characterized by significant scientific and technological inventions and innovations. In the upswing phase of the first wave it were the use of a steam engine, the spread of the factory form of (industrial) production and the development of the textile industry. The rise phase of the second wave was characterized by the construction of railways, which allowed to explore new territories and increase productivity in agriculture. The upswing wave of the third wave was due to the wide application of electricity, radio and telephone. N.D. Kondratiev saw the prospect of a new upswing in the automotive industry.

The second empirical correctness asserts that the raising phases of large cycles in comparison with downswing phases are richer by social upheavals such as revolutions or wars. According to N.D. Kondratiev, among the most famous historical events during the raising phase of the first big cycle were the French Revolution of 1789–1794 and the Napoleonic Wars; for the period of the upswing phase of the second big cycle it were the French Revolution of 1848, the revolutionary movement in Germany from 1848 to 1849, the Crimean War of 1853–1856, the Civil War in the United States of North America (1861–1865), the Franco-Prussian War, etc.; during the raising phase of the third big cycle there were such events as the First World War, the revolutionary events in Russia in 1917, the changes to the map of Europe in accordance with the Versailles Peace Treaty (1918), and others.

The next empirical correctness, according to N.D. Kondratiev's studies, is connected with influence of the big cycles on the dynamics of the classical 7–11-years cycles; i.e. the Juglar wave, meeting the corresponding phase of the long wave, changes the length of its own phases (in other words, this phenomenon is similar with the interference of waves in physics; however, N.D. Kondratiev himself did not use this physical analogy). So the upswing phases of big cycles are characterized by a larger number of the prosperous years of the middle cycle, while during the downward phases of big cycles the crisis years are becoming more frequent. In other words, the deepest and prolonged crises (as, for example, the Great Depression) fall on the downswing phases of the long waves.

Finally, the fourth empirical correctness asserts that the downswing phases of the long waves are characterized by comparatively long depressions in agriculture [Kondratiev 1989].

2.2.   After Kondratiev: The technological interpretations of the long waves

The study of N.D. Kondratiev gave a new impetus to the study of long-wave processes in the economy and social life in general. Each of the listed "historical correctness" observed by N.D. Kondratiev has been developed in different versions of the modern theory of long waves, such as the technological innovative theory (comparable to the first empirical correctness); the theory of social (military) cycles of J.S. Goldstein [1988] (first of all, comparable with the second empirical correctness of N.D. Kondratiev); the attempts to explain the long-term fluctuations of economic activity by the cycles of Solar activity (comparable to the fourth empirical correctness), etc. Consequently, the theory of long waves has grown beyond the limits of the actual economic science, representing as well a considerable interest for sociologists and historians.

Among economists, despite coexistence of different interpretations of the K-waves, the innovation-technological approach can be considered as dominant, even because the prevailing title of the big cycle is innovative or technological. J. Schumpeter, combining his own conception of economic development based on (mainly technological) innovations implemented by entrepreneurs and N.D.

Kondratiev's study of major economic cycles (mainly, the first empirical correctness), in his fundamental work dedicated to business cycles [Schumpeter 1939], gave his own technological interpretation of the three big cycles, known for that period of time.

In contrast to S. Kuznets, who at that time regarded the breakthrough innovations as randomly distributed in historical time, J. Schumpeter supposed that these innovations tended to occur in clusters: major breakthrough innovations ("basic innovations") would be introduced into the market discontinuously in time, i.e. in a roughly 50 years rhythm [Kleinknecht, Van Der Panne 2006, pp. 118, 119]. In his opinion, the temporal clustering of a number of major technological innovations in a trough of a cycle, i.e. during periods of deflation and recession, might be the primary mover of the dramatic growth of the so-called leading sectors, which, in turn, drive the general growth in the long wave upswing. So depending on leading technologies and industries in the corresponding periods of time, the first Kondratiev wave (1780s to 1842) Schumpeter called "the cycle of the industrial revolution"; the following second Kondratieff cycle (1842–1897) he called "the age of steam and steel", or the "bourgeois Kondratieff"; and the third Kondratiev (1898–1929, or 1898–1938) was characterized by Schumpeter as a big cycle of "electricity, chemicals, and motors".

The late 1970s and 1980s brought a surge of new interest in the phenomenon of long waves, also under the impact of the energy crisis and stagflation processes of 1970s. In particular, G. Mensch in 1979 was the first who re-discovered the old Schumpeterian innovation-clustering hypothesis. G. Mensch attempted to explain the gaps between clusters by invoking a theory of investment behaviour, namely, that during periods of general prosperity investors will avoid risky long-term ventures (innovations) whereas during periods of stagnation or recession they may be more willing to invest in new ventures. He also provided data on "basic innovations" that should prove the realism of J. Schumpeter's clustering hypothesis. Also, among important developers of the long wave theory on the technological-innovations basis including criticists of G. Mensch's innovation series, are often mentioned researchers such as E. Mandel, J. Clark, C. Freeman, J. van Duijn, E. Mansfield, A. Kleinknecht, R. Ayres, G. Dosi, C. Perez, C. Volland, and many others [Kleinknecht, Van Der Panne 2006, p. 119; Ayres 1989] and others. Until today, besides the fundamental issue concerning existence of K-wave fluctuations and their theoretical explanation, the discussions have been continuing about long-wave chronologies (especially with regard to the fourth and fifth K-waves), what indices and statistical methods are more correct for revealing of the long waves, what technological innovations to regard as basic and, accordingly, about data collection that can be depended on personal judgment, etc.

To date, the supporters of the technological-innovation version of long waves determine the five long waves and even predict the sixth one. In particular, according to some estimates, the fourth wave lasted roughly from 1939–1945 to 1974–1983 and was connected primarily with mass-market consumer goods; and

the fifth K-wave which began in the early 1980s is related to the development of information technologies. However, it would be a mistake to associate every K-wave with only one technology or industry, as the technological-innovative development of economy is very complex and multidimensional process.

The technological-innovative theory of the long waves is closely related to the technology life-cycle theory, diffusion of innovations theory, evolutionary economics and the complexity approach. In general, many theorists agree that technological innovations stimulate macroeconomic growth, and the periods of rapid growth are typically characterized by the diffusion of basic technologies developed in earlier periods. However, they are not always in agreement with each other answering the questions such as: in what precisely phase of the long wave the breakthrough inventions and the clustering of innovations proceed; whether periods of slow growth are really effective in stimulating technological innovation; whether the occurring innovations and clustering of innovations are always related to macroeconomic factors; etc. So it is still early to speak about non-controversial technological theory of the long-wave phenomenon.

2.3. Institutional-legislative approach

Speaking of technological innovation as the key driving force of each big Kondratiev cycle, we must not forget about the role of institutional factors. The very phenomenon of the industrial revolution (that characterized the first long K-wave) is inconceivable without certain institutional changes. For example, G. Tullock, asking the question "why did the industrial revolution occur in England" (this question is also the title of Tullock's paper, firstly published in 1988), answers it in this way: "I have argued that the development of the industrial revolution in England was essentially the result of a series of changes in the British political order that occurred during the period of the English revolution" [Tullock 2005, p. 170]. Another prominent economist William J. Baumol, reflecting on the similar question, wrote that b "the rules of the game that specify the relative payoffs to different entrepreneurial activities play a key role in determining whether entrepreneurship will be allocated in productive or unproductive directions and that this can significantly affect the vigor of the economy's productivity growth" [Baumol 1990, p. 918].

Not surprisingly, some authors criticize J. Schumpeter for his overly technological approach and raise the question about institutional factors which stimulated and facilitated the technological changes and, thus, the economic growth during upswing phase of every long wave (see e.g. [Kingston 2006; Croitoru 2017]). In this context, it is worth mentioning the approach offered by W. Kingston. In his opinion, Schumpeter's theoretical model ignored institutional change, specifically legislative change, and that institutional changes embodied in legislation were exactly what Schumpeter needed. Investment is not only technologies but ways of doing business which may require legal change if they are to develop. So W. Kingston proposes the alternative, namely institutional view of long cycles according to which each

long cycle is "a wave of investment originating in a discrete event, which is a legislative change causing investors' perceptions of future profits to be rendered more optimistic". In its turn, the length of a cycle is determined by how long it takes for all investors to grasp the implications of such an institutional change, and to take advantage of it [Kingston 2006, p. 99].

From such a co-evolutionary perspective (as it regards the both technological and institutional-legislative changes in their interrelationship), W. Kingston observes every historical long wave and its technological changes considering the relevant important legislative innovations. So according to him, the first Kondratiev wave (1780s to 1842) was made possible by the development of a legal system providing for "full" property rights. The latter, in particular, fostered the expanding canals-building that was the specifics of that period. Also this period was characterized by another important institution, i.e., a great expansion of corporations, in which investment could be made with limitation of the investor's liability to his stake in a project. In Kingston's opinion, precisely the following second Kondratiev cycle (1842–1897) "depended greatly upon making generally available the remarkable social innovation of the Corporation with limited liability" [Kingston 2006, p. 100].

The third K-wave (1898–1938) Kingston connects with implementation of some intellectual property laws that were necessary for the science-based industries. In particular, he mentions patent laws in USA accepted during Abraham Lincoln presidency, 1877 Patent Act in Germany, and internationalization of patents by the 1883 Paris Convention. In particular, Kingston marks that after Germany joined Paris Convention in 1903, the German firms were outstandingly successful at using its provisions to build up dominant positions in the world markets.

Extending the analysis beyond the three "long cycles" discussed by J. Schumpeter, W. Kingston explains the fourth Kondratiev cycle by the combination of laws which made possible the industries based upon brands, that is, those of mass-market consumer goods. He marks that the markets of all these industries require that consumers have discretionary income. "The growth of this element in salaries and wages was in turn brought about by institutional changes embodied in legislation, especially the laws which legitimized trade union activity" [Kingston 2006, p. 103].

As for the last (present) fifth big cycle, its main characteristic industries are entertainment and information technology. In its turn, the modern entertainment industry depends completely on copyright law, whereas the growing investment in information technology was only possible through the extension of copyright protection to computer programs. According to Kingston, "these fourth and fifth 'cycles' are closely associated with globalization, an important aspect of which is a thrust towards establishment of similar laws of property rights throughout the world", and, in particular, the World Trade Organization was established to be the main instrument for this [Kingston 2006, p. 103].

The Kingston's description is a bright demonstration of the dependence of long-run technological evolution upon institutional-legislative changes. However, his

conception has rather exogenous character and does not answer the question about the length of the long K-wave, i.e. why the impact of relevant-institutional legislative changes is weakening precisely through about 55 years.

3. In searching for endogenous factors of the long waves. The examples from the social theories

Although the phenomenon of long waves was originally discovered and researched by economists (i.e. within the framework of economic theory), its main features and mechanism of occurrence go far beyond the pure economic phenomena and cover also social and political processes. In its turn, the idea about cyclic character of some social processes human history is enough old. For example, already the Greek philosopher Plato described the cyclical changes of different political forms such as anarchy, monarchy, aristocracy, oligarchy and democracy. In the 18th century, Giambattista Vico (1668–1744) viewed societies as passing through a cycle from their anarchic or "bestial" origins through the "age of the gods", in which superstitious humanity is controlled by priests, to the "age of heroes", in which society is ruled by aristocratic dynasts, followed by the "age of men" introduced by uprising of the majority plebeians against the minority patricians. He asserted that the "age of men" would degenerate into a second state of barbarism, impelled, among other causes, by loss of national independence, and by progress in technology. In this second state of barbarism, "a man becomes a coward, an unbeliever, and an informer", these degenerate people do not hesitate to rush into the worst of slaveries to find shelter and protection, money becomes the only value" [La Belle 2012, pp. 170-171].

In the 19th century, V. Pareto, in the context of his sociological theory of elites, wrote about the existence of "the rhythm movement of sentiment which we can observe in ethics, in religion, and in politics as waves resembling the business cycle". Along with this, he understood a sentiment as the basic irrational feelings and desires of the people, which determine the motives of their actions [Pareto 2008, p. 31]. At the same time, in opinion of V. Pareto, "when an elite declines, we generally observe two signs which manifest themselves simultaneously": on the one hand, the declining elite becomes softer, milder, more humane and less apt to defend its own power; on the other hand, "it does not lose its rapacity and greed for the goods of others, but rather tends as much as possible to increase its unlawful appropriations and to indulge in major usurpations of the national patrimony" [Pareto 2008, p. 59].

In the middle of the 20th century, P. Sorokin, on the basis of his historical analysis of different social and political systems, concluded that there is no stable tendency of the social and political development in direction from monarchy to republic, from autocracy to the growing democracy, from the absence of government intervention in the life of society to the full state control, or vice versa [Sorokin 1992]). Besides, in his opinion, a human society is always politically, socially and economically

stratified, but every society always deals with the struggle between forces of political alignment and forces of stratification: when the oscillation of a stratification profile in definite direction becomes too strong and sharp, the opposing forces in different ways increase their pressure, and a stratification profile returns to an equilibrium point.

The phenomenon of the self-degradation of democracy was described by the Spanish philosopher J. Ortega y Gasset in his book *The Revolt of the Masses* [1993]. The central figure of his conception is a mass-man who can be viewed as a product of the epoch of technological successes with its expansion of costumer's satisfaction in goods. In opinion of Ortega y Gasset, the mass man has the psychology of the spoilt child who *behaves* "as everything is permitted to him and he has no obligations". The mass-man believes "that he is the only one that exists, and gets used to not considering others", he regards himself as perfect, he is "incapable of any other effort than that strictly imposed on them as a reaction to external compulsion", "whose life lacks any purpose, and simply goes drifting along", "who is not interested in the principles of civilization" [Ortega y Gasset 1993]. So the mass-man is that type of individual who is a by-product of democracy, because the latter fostered technological progress and, in turn, the emergence of (conditionally) surplus goods during the 19th century. These goods, however, spoil humans and give them a sense of being the masters of life, losing respect for other humans and, in the long run, the law. Once people stop respecting the law, they destroy the democratic rules too.

Although in this conception J. Ortega y Gasset did not write about the social cycles, he warned that a society could return to primitivism in the result of the loss of the memory of the past. Similarly with an old man who has lost the memory of the past and does not profit by experience, the same disadvantages characterize a human society. So J. Ortega y Gasset considered Bolshevism and Fascism as the two examples of essential retrogression and marked that "historical knowledge is a technique of the first order to preserve and continue a civilization already advanced" [1993, p. 91].

In the same work, J. Ortega y Gasset pointed out to connection between some historical events and change of generations. In particular, he wrote that "a revolution does not last more than fifteen years, the period which coincides with the flourishing of a generation" [Ortega y Gasset 1993, p. 93]. In his opinion, a generation lasts about 30 years. But its activity divides into two stages and takes two forms: during approximately one half, the new generation carries out the propaganda of its ideas, preferences, and tastes, which finally arrive at power and are dominant in the second half of its course. But the generation educated under its sway is already bringing forward other ideas, preferences, and tastes, which it begins to diffuse in the general atmosphere. If the ideas and tastes of the ruling generation are extremist, i.e. revolutionary, the new generation is anti-revolutionary, but this fact does not mean a simple return to the old ways [Ortega y Gasset 1993, p. 93].

4. The main hypothesis. Change of generations and the erasure of historical memory

The both issues, already noted by J. Ortega y Gasset – on recurrence of historical events caused by loss of historical memory (the society's memory of the past), and also the thesis about connection between duration of some historical processes and duration of generations – can be used as a possible answer to the question, why the duration of a long Kondratiev wave is about 55–60 years.

As for the duration of the long Kondratiev wave, there is an assumption that it is associated with a change in generations of labor resources, each of which equals approximately 25 years. For example, E.V. Balatskiy, analyzing the economic structural cycles of 14 years, drew attention to the fact that each phase of the K-wave covers just about 14 years. In his opinion, the long waves and structural cycles can be closely related to the existence of generations of labor resources, each of which is equal to about 27–28 years, and thus we can speak about the existence of some psychological patterns of the occurrence of a long wave [Balatskiy 1993].

In 2002, one of the authors of this paper expressed the view that the duration of the K-wave really has a link with the change of generations and psychological factors, namely, the cycles of memory of generations, which also makes sense to be characterized as information waves [Voznaya 2002]. Such a conclusion was based, first of all, on the second "empirical correctness" of N.D. Kondratiev, according to which the periods of upswing wave of big cycles are much richer by social upheavals in the life of society (war, revolution, etc.) than downswing waves.

Suppose that a major social and political event happens in a society at given time *t*. This *t*-event has a direct impact on its contemporaries, defining their succeeding activity. The period of active impact of the *t*-event covers approximately the labor active phase of the life of *t*-event's contemporaries and equals the difference between average life expectancy (approximately 70–75 years old) and the minimum-conscious active age of population (approximately 15–18 years old). So this period equals about 55–60 years, i.e. just the period, which characterizes a long Kondratiev wave.

The contemporaries of a *t*-event comprise at least two groups. The first group consists of active participants (witnesses) and generators of a *t*-event. We call this group a *t*-generation. The second group consists of comparatively passive participants (witnesses) of the *t*-event. The representatives of the first group consist the working age people (from 16 till 50–60 years old). At the same time, the representatives of the second group are located in the lowest (under 16 years old) and the highest (over 55–60 years old) sectors of the age distribution diagram. Who belongs to the lowest sector of the age distribution diagram (under 16 years old), can be characterized as a (*t*+1)-generation. The representatives of the highest sector of this diagram (over 55–60 years old) are forming a (*t*−1)-generation.

An information impulse of *t*-events, historical memory about the *t*-event is weakening as a *t*-generation is becoming more mature and a $(t − 1)$-generation is leaving the historical scene. Relative loss of the memory of society on the *t*-event occurs when the youngest participants of *t*-events leave the historical arena (due to their old age and physical death). Because the difference between the 16 years age and the average life expectancy equals about 55–60 years (for example, $75 − 16 = 59$), the time distance between *t*-event and the loss of the historical (vivid but not librarian) memory about *t*-event is precisely the length of the long K-wave.
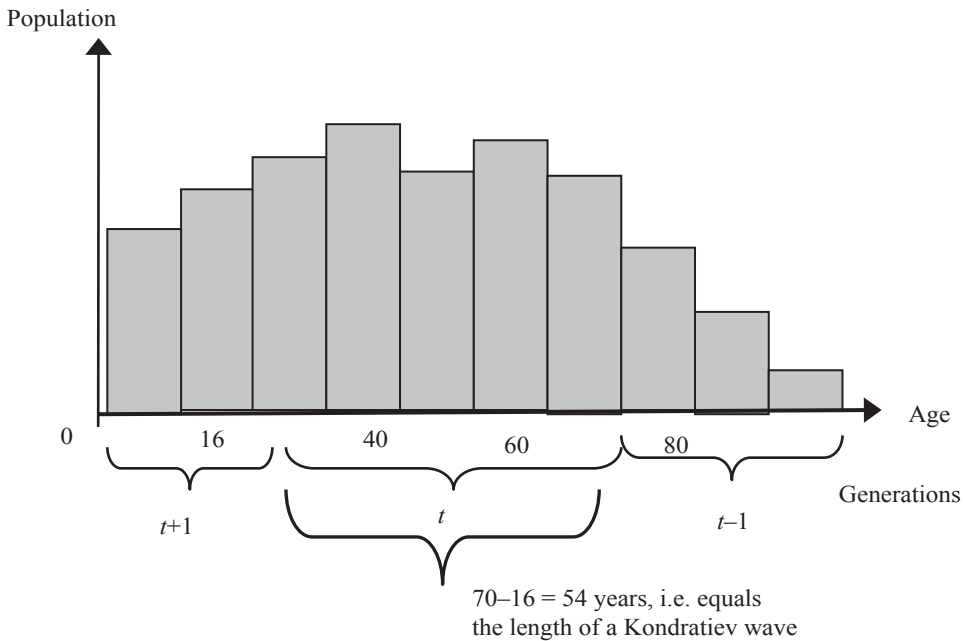

Figure 1. The time distance between generations

Source: own elaboration.

The erasure of society's memory about a catastrophic event increases the risk of its recurrence. A *t*-event (e.g. the Great Depression of the 1930s or the World War II), with its devastating consequences for a society, also causes the creation of some institutions designed to mitigate the consequences of this event and avoid the recurrence of such an event in the future (e.g. the institutions created in the 1930s to support stability of banking system). As the historical memory about the *t*-event is weakening (when a *t*-generation is becoming more mature and a $(t–1)$-generation is leaving the historical scene) the destruction of the memory about the *t*-event leads to the erosion of mentioned institutions. This increases risks of a recurrence of such events in the future.

It is necessary to mark that, to some degree, our hypothesis is consonant (but not identical) with the generational theory of W. Strauss and N. Howe who described a recurring generation cycle in American history (see [Strauss, Howe 1991; Mirkowska 2017]). According to their theory, an average life of people is about 80 years, and consists of four periods of about 20 years. A social generation is the aggregate of all people born over a span of roughly 20 years or about the length of one phase of life: childhood, young adulthood, midlife, and old age. Each generation experiences "four turnings" – the four social or mood eras: "The High", "The Awakening", "The Unraveling" and "The Crisis". Also W. Strauss and N. Howe tried to determine the four generational archetypes such as Idealist, Reactive, Civic, and Adaptive (in the first version) and Prophet, Nomad, Hero, and Artist (in the second version).

Unlike the Strauss–Howe theory, we combine the idea of generations with a theory of long Kondratiev wave, and we define a *t*-generation exclusively in its relation to a *t*-event underlining the role of historical memory about some special historical events. However, similarly our hypothesis also assumes the (generational) change of the inclination of a society to social cooperation, risk and innovations.

5. A change of generations and erosion of institutions. Some examples

Based on the hypothesis described above, we can suppose that some problems faced by modern Western society (the growth of financial instability, growing political corruption, the growing risks of wars) can also be associated with the long-wave cycle.

5.1. The erasure of national security institutions

One of the brightest examples of the process described above is the World War II that has had a significant impact on literature, painting, and cinema for the next decades. With the erasure of the historical memory of a society about the horrors of the past war, the fear of war is lost; moreover, in the eyes of new generations the very war is capable of becoming idealistically attractive. In addition, a society begins to lose caution, believe in eternal peace as a matter of course, and begins the disarmament and dismantling of institutions that provide national security; or these institutions become ineffective and acquire more and more the character of theatrical scenery. As a result, in terms of its safety, a society becomes to be more vulnerable, and the threat of society's involvement in a new war is growing.

5.2. Between the Great Depression and the Great Recession

The kind of long-term fluctuations, comparable with the process of a change of generations, we can consider observing the long-term tendencies of economic policy. An example is comparison between the "New Deal" of F.D. Roosevelt, held in the US between 1933 and 1940 years, and so-called "Reaganomics", i.e. a set of activities

held by the President Reagan's administration during the 1980s. While the "New Deal" aimed at overcoming the consequences of the Great Depression and used the measures for the implementation of central planning and state economic stimulus, the "Reaganomics" applied the measures to decentralize and weaken the state's role in the functioning of economy.

Despite the changes in macroeconomic policy in the US during the 1980s were objectively caused by failures (ineffectiveness) of the state, we should not also exclude the factor of "generations changes", i.e. the weakening of society memory about the Great Depression and its severe social economic consequences. So J. Komlos, analyzing the origins of the Great Recession that began in the US economy in December 2007 and transformed into the global financial crisis of 2009, mentions the erasure of society's memory about the Great Depression. In particular, he writes that "as the hard times of the Great Depression faded from memory, financial stability was taken for granted and assumed to be the new normal" [Komlos 2014, p. 229]. On the one hand, the institutions created by FDR to safeguard against bank runs became outmoded as they were not modernized to keep up with new business practices; on the other hand, many of the Great Depression-era regulations that were the guarantors of "boring" banking were slowly dismantled, i.e. "the institutions that were put in place during the Great Depression were being gradually eroded for decades by overconfident regulators, ideological politicians, and financiers" [Komlos 2014, p. 230]. Thus, the destruction of the memory about the Great Depression led to the destruction of institutions that ensured the stability of financial system and, therefore, led to increased risks of the new deep economic crisis emerging.

5.3. Populism and perversion of democracy

As an illustration of our hypothesis we can also compare the values and preferences of the founders of European integration institutions and their contemporaries with the preferences of modern generation and policy-makers. On the one side of this 60–65 years segment we observe the generation which knew the horrors of war and famine, fought for peace and freedom, had the experience of brotherhood and sacrifice, experienced the post-war poverty and had the problems to get education, rebuilt the post-war economy and respected democratic institutions. On the opposite side we observe the generation of people who cannot imagine hunger, inability to get even primary schooling, and many of who regard the possession of the latest model of iPhone as the most important measure of personal achievement. Although an example of one country is not conclusive, the case of Italy is indicative: from 1948 to 1955 the post of president of the country was occupied by Luigi Einaudi, the intellectual and author of numerous scientific and journalistic works on economics and politics; however, from 1994 to 2011 as the main Italian top-politician we observe Silvio Berlusconi, the media tycoon, who served as Prime Minister of Italy in four governments and who was repeatedly accused of violating the law.

6. Conclusions

All the existing theories of the long cycles are, in some way, valuable but they do not explain explicitly the length of the long Kondratiev cycle. We suppose that this length can be related with a change of generation and, correspondingly, with change and erosion of historical memory of a society. Our hypothesis is primarily based on the second "empirical correctness" of N.D. Kondratiev, according to which the periods of upswing wave of big cycles are much richer by social upheavals in the life of society than downswing waves. We call such an event a *t*-event and, correspondingly, use the term *t*-generation.

 The important, mostly tragic, historical events are the basic impulse for the forming of the society's historical memory. Also, they cause the formation of some important institutions designed to mitigate the consequences of this historical event and avoid the recurrence of such an event in the future. On the one hand, a change of generations fades the historical memory about a *t*-event and, thus, can lead to erosion and dismount of relevant institutions. This increases the risks of a recurrence of similar events in the future. On the other hand, a change of generations and a weakening of the social memory about *t*-event can influence the general propensity of a society to risk. The growth of this propensity (the dominance of a generation with a higher propensity to risk) leads to acceleration of the both institutional and technological innovations; in its turn, the splash of such innovations is often accompanied by social and political upheavals.

 If to assume that the propensity to risk can be the general characteristics of a generation, it makes sense to revise the hypothesis that "during periods of general prosperity investors will avoid risky long-term ventures (innovations) whereas during periods of stagnation or recession they may be more willing to invest in new ventures" (see above the ideas of G. Mensch). So the propensity of investors to avoid or to undertake investments in risky innovations can be also dependent on more complex social determinants. Thus the conception of generation can be used as a synthesis basis for the theory that can (at least partially) explain and harmonize the different approaches to the explanation of the long wave phenomenon, as well to explain the length of the K-wave and repeatability of some historical events. The phenomenon discussed above gives us the material for further reflections and studying of the problems concerning institutional changes and economic dynamics in their interaction.

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