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3 October 2013

Online at <https://mpra.ub.uni-muenchen.de/53688/>

MPRA Paper No. 53688, posted 16 Feb 2014 04:21 UTC

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October 2013

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Abstract. This article tries to give evidences the Schumpeterian innovation theory of business cycles gives us the most satisfactory understanding interrelations between business cycles and economic growth. It is shown that roots of this conceptual approach were created in 1894 by monograph of M.I.Tugan-Baranovsky, who can be recognized as precursor of the Schumpeter’s Theory of Economic Development. The article presents historical analysis of the genesis and genetic line of the innovation theory of economic development till the modern Neo-Schumpeterian conceptions of technological paradigms. It lays methodological basis for the conclusion the innovation technological change and the corresponding restructuring of national economy must be recognized as the main measures to overpower the recession and to ensure the economic growth in long-run perspective.

Keywords: Tugan-Baranovsky M.I., Schumpeter J.A., Neo-Schumpeterian concepts, business cycles theories, technological paradigm, innovation model of economic growth

JEL Classification: N10, O11, O30, O40.

1. Introduction

The problem of coexistence the economic growth and business cycles has a long history and a huge array of academic literature. But if we consider this problem in light of its actualization due to the last economic and financial crisis, we can find the major question which excites scientists and politicians is whether such point of cycle automatically will be overcome by adjusting market mechanisms or we have dangerous situation that sounds as collapse of capitalism. The “mainstream” of economic theory - neoclassical theories of general equilibrium from Leon Walras (Walras, 1874) to the Real Business Cycle theories (Kydland and Prescott, 1982; Rebelo, 2005), have been believing there is a long-run positive sustained trend of economic growth, which includes a short term fluctuations influenced by external shocks. In the each such case of economic turbulence the market's cleaning adjustments restore general trend of development. The first ‘stylized fact’ of Nicholas Kaldor that was put by him as a starting-point to build theoretical models of the economic change and development in capitalist societies is “the continued growth in the aggregate volume of production and in the productivity of labour at a steady trend rate” (Kaldor, 1961). Also we can recognize the beginning of such theoretical thinking from Jean-Baptiste Say (Say, 1803), fundamental the Say’s Law "Supply creates its own demand". But if we will look at the economic history of capitalism from Adam Smith till nowadays we will not find evidences that the mentioned built-in stabilizers ensure smooth and optimistic development.

The intellectual events concerning to explanations of current economic and financial crisis have showed that a prevailing vision of nature this crisis remains neoclassical. It means that causes of crisis are searched among external shocks: mistakes in finance management on different levels of economy, bad government, negative internal and external politic influences etc. Majority of such explanations can be considered as sort of subjective failures. But such inadvertence can enough

easy be eliminated as by a market self regulation mechanisms as by the operative politic measures. However there were crises that could not be explained by casual external shocks which do not change in the long run a general positive trend of economic development. The history demonstrated much more deep reasons for some crises that led to wars and cardinal social revolutions which had changed the existed economic order. In these cases, it was necessary to create new economic theories to give clarification what were happening. Today we also can hear about such necessity. In this paper we will try to give evidences that the Schumpeter's conceptual vision of the objective nature of economic and financial crises gives us the most satisfactory understanding this problem.

But as showed history of economic thoughts the Schumpeterian approach was and remains on periphery of intellectual searching not only in framework of "mainstream" theories. In majority of main modern text-books in Macroeconomics, Microeconomics, Economic Growth and in similar subjects we either don't find chapters about Schumpeter's theory or such information is given as general overview in historical sense. True, the text-book "Introduction to Modern Economic Growth" (Acemoglu, 2009) has become a pleasant exception. Also for examples of ignoring Schumpeter's theory, we can mention some recognized books concerning themes of the economic and finance crises: "This Time is Different: Eight Centuries of Financial Folly" (Reinhart and Rogoff, 2009), and "Manias, Panics and Crashes: a History of Financial Crises" (Kindleberger and Aliber, 2005). It is clear that for a long time there was a question: "Why Schumpeter's theory has not been introduced in basic text-books in Economics as well as, for example, Keynes's theory?" It is not a simple question. But in our opinion one of the essential reasons of it is weakly awareness the genesis of Schumpeterian conception, where famous Ukrainian economist M.I.Tugan-Baranovsky was pioneer and coryphaeus. We think the genetic line of the innovation theory of economic development and a modern conception the innovation (knowledge, smart) models of economic growth basically may be

represented by following names: Tugan-Baranovsky (1894, 1900) - Spiethoff (1903) - Schumpeter (1912) - Kondratiev (1925) - Schumpeter (1934, 1939).

The conceptual distinction of this theoretical approach from neoclassical logic lies in recognition the inner forces of market system, which condition the economic crises of capitalism, and the same forces determine economic growth. These forces are technological innovations. Without last one the national economy inexorably will come to crisis and, in reverse, the progressive technological change can help overcome crisis and cause economic growth. I think the economic failures of the transition economy of Ukraine is largely due to the rigid focus on neoclassical prescriptions of the "Washington consensus", where there is no requirement of innovative technological changes in the economic structure. In general sense we can consider contradictive approaches to explanation nature of economic growth and business cycles: 1) neoclassical believe in effectiveness of general equilibrium position with supporting constants of main ratios between output, investments, consumption, and employment; on this methodological way we should not pay special attention to technological structure of national economy; and 2) the Schumpeterian approaches that pay main attention to technological innovations and the structure of technological change. Josef Schumpeter names these two attitudes as "Statics" and "Dynamics" stages of cyclical economic development. The real economic growth can be, according to Schumpeter, only on "Dynamics" stage.

The modern crisis has restored another question from the seemed a distant history, whether capitalism can ensure a long-run development? This issue was burning in the imperial Russia at the end of the 19th century and remains relevant during economic discussions until nowadays. The 100 years ago, inability to make a correct answer to this question in the real politics gave rise to the Russian October Revolution in 1917, also was the reason for the Great Depression in the USA, and fascists taking the power in Italy and Germany during the 20-30ies. The ways of recovery were not similar in context of various social and economic systems. The liberal democracies applied recipes which had been generalized in the Keynesian

theory. The USSR, Germany and several totalitarian states chose other way which eliminated free market economy and adopted the command systems of the resource distribution in order to combat the economic recession. The first economist who understood the essence of the above said economic processes was M. I. Tugan-Baranovsky. We will review his contribution with original theory of economic cycles into the conceptual framework of the Schumpeter's innovative theory of economic development as well as elaborating by the Neo-Schumpeterian scholars.

The case of Ukraine also is very interesting for developing of economic theory because current transitive problems have a long history as searching conceptual and applied recipes to build effective market economy. Ukraine as a part of Russian Empire had been involved into the powerful processes of building capitalism more than a century and a half ago. That experiment had led to Great October Revolution in 1917 in Russia and the similar processes had led to other anti-capitalism revolutions over the world. Mentioned ways had not provided the just and effective economic order for these countries but failures of market economy remain real threats for social stability for many countries. The brilliant clarification of mentioned problem was given by M.I.Tugan-Baranovsky in his theory of economic cycles (Tugan-Baranovsky, 1894), which then became a source of Schumpeter's theory of economic development. That is why the clarifying of main propositions of Tugan-Baranovsky's concept helps us to be better understanding of Schumpeterian approach. Also it is important to lay the theoretical foundation for using Schumpeterian and Neo-Schumpeterian approaches to solve current economic problems. The evolutionary nature of knowledge creation requires understanding of history as an effective methodological potential for modern research. This point is particularly important to study those current problems that seem to be moved by 'The Time Machine' from the beginning of the twentieth century. In that time, the theoretical and practical discussions about the prospects, forms and methods of capitalism development were very urgent. M.I.Tuhan-Baranovsky was in the centre of those discussions and events, and they continue to be relevance for us today.

2. M.I.Tugan-Baranovsky as precursor of the innovation theory of cycle and economic growth

It is amazing how many conceptual ideas, appearing in advance of his time and afterwards underlying the fundamental economic theory, were generated by M.I.Tugan-Baranovsky over a hundred of years ago.

The economic thought in many countries, including Ukraine, from time to time has come to the crossroads which the Russian Empire experienced in the Tugan-Baranovsky's times. One way is that a country is recognized to be involved in the rule of the uniform path of the human civilization evolution and to be in need to use such development recipes, which have been developed and are applied by countries leading in the economic competition. The second way is a search of a specific civilization path which seems to have been developed for an individual country. When resolving burning issues of the Ukrainian and Russian market economies arising during the transition from "plan to market", today many national economists keep basing a lot of concepts on the Marxist capitalism theory, which belongs to the school of political economy of the 18th-19th centuries. Therefore, scientists and politicians from transitional countries, in their efforts to absorb the world economic thought, resolve those eternally unresolvable issues, which Russia and other countries faced in the beginning of the 20th century, when M. I. Tugan-Baranovsky appeared to be a hallmark. The relevance of considering those "eternal issues" again referred to the events associated with the modern financial and economic crisis, when many people started doubting that the capitalist economics can be effective just in the same manner as people did a hundred of years ago. We will further review M. I. Tugan-Baranovsky's contribution to the topic of the theory of economic development, i.e. the market theory and the innovation theory of economic development.

Market Theory

The issue which was called the market theory during the Tugan-Baranovsky's times, is, in fact, the issue of market efficiency. Can capitalism provide for

sustainable economic growth of a country? This question was burning in the imperial Russia at the end of the 19th century and remains relevant during economic discussions concerning the current economic and financial crisis. The century ago, inability to make a correct answer to this question in the real politics gave rise to the October Revolution in 1917, which took place in the Russian Empire, and Russia's long-standing refusal from capitalism as a business regulation. That was the reason for the Great Depression in the USA, and fascists taking the power in Italy and Germany during the 20-30ies of the XX century. The ways of recovery were similar, yet within the context of various social and economic systems, i.e. the USSR, Germany and other states took the way of declaring off the market-regulated economy and adopting a command and administrative systems of resource distribution in order to combat the economic recession.

The first one who understood the essence of the above said economic processes was M. I. Tugan-Baranovsky. The question which required an answer had the same formulation as it is now. Let's cite Mikhail Ivanovich where he makes a clear presentation of the problem: "The public has been persuaded for many years already that the Russian capitalism is not similar to the Western European capitalism. In the West, capitalism gave rise to enormous boost of the national wealth, substantial increase in product yields... In leading Western countries, farming is no longer an underlying principal industry giving a lead to the production... We get proofs that we can see a different situation in Russia. Growth of capitalist production made the country poorer rather than wealthier; the manifestations of such impoverishment were not only those producers went poor, but also that total product yield tended to reduce... Like it had been before, agriculture is the foundation of our economy. Mister Harvest rules in this state... The Russian capitalism is similar to the Western European capitalism by its disadvantages; in fact, it largely lacks advantages... This is the exact or similar light in which the Russian and Western European capitalism forms were presented by our honourable economists" (Tugan-Baranovsky, 1898).

Tugan-Baranovsky was one of the first in the economic theory to formulate the issue that a proper market requires effective aggregate demand. He expressly argued in his works that the economic growth in capitalist countries was hampered by the "lack of market", i.e. demand for products which might have been eventually produced by a capitalist system. "What are the grounds for such lack of market, such difficult sale of products, whereby capitalist production constantly squeezes the market, is constantly inclined to produce more than the market can afford? This is the important and complicated market problem, which the economic science failed to resolve for a long time" (Tugan-Baranovsky, 1909).

Tugan-Baranovsky's answer to this question was a new theory of economic crises, which is, in fact, acknowledged to be the first scientific theory pertaining to that phenomenon, because before the Tugan-Baranovsky's contribution the nature of a crisis had been explained primarily by occasional external factors. Tugan-Baranovsky was the first to show the endogenous causes of the business cycle of the capitalism system. That allowed him to develop recipes to respond to the crisis phase without changes in the social order. Understanding the cause of the "disease" allowed for proposing "drugs".

His main idea was that "the capital accumulation is not merely a simple replacement of capital consumption with employee consumption. The reason is that the accumulated capital transforms not only into a salary, but also into means of production, which are not elements of consumption of whatever class of the public" (Tugan-Baranovsky, 1898). That conclusion differed from theoretical visions existing at that time. The basis for the latter was Sismondi's theory. The Sismondi's theory argued that capital accumulation caused social consumption by way of relative reduction of social profit. Finally, that would reduce social demand and inhibit the development of a country. That logic gave rise to conclusions, including Marxists' conclusions, that economic crises were inevitable and that the capitalist business system must be destroyed. That was the reason why K. Marx believed that the capital

itself generated increasing restrictions for the development of capitalist production, which is why that economic system may not have historical perspective.

Tugan-Baranovsky performed a deep analysis based on Marxian reproduction patterns and showed that “due to proportional division of social production, social demand and social supply remain balanced”. He found the newly founded market theory to be a paradox: “The core of this theory ... comes to the argument that demand for means of production creates a goods market in the same manner as demand for consumer goods does; therefore, no reduction in the share of consumer goods is able to pose new difficulties for sale of goods of capitalist production” (Tugan-Baranovsky, 1898). Based on his market theory, Tugan-Baranovsky believed that the principal reason for capitalism failure in Russia was insufficient development of the national investment market where the problem of profit capitalization existed. That recipe was elaborated as a response to standard critics’ arguments of market economy development, which we can regularly hear in the contemporary Ukraine. Tugan-Baranovsky’s opponents viewed foreign trade development only as an opportunity for the development, because that way was believed to generate national income increase within a country. That meant that increase in aggregate demand for domestic goods was possible only by way of expanding such demand. However, scepticism penetrated assessment of Russia’s entry into foreign market: domestic producers “are not wanted there, quality of their goods is not competitive - that is why Russia cannot develop as a capitalist country, it needs “a separate way” (Tugan-Baranovsky, 1894, p. 406). Such arguments can often be heard in the modern Ukraine.

Tugan-Baranovsky’s market theory gave the answer that was later developed by John Keynes. Today, we can find it in latest economics textbooks. The resolution can be found not abroad, but inside the country by handling low aggregate demand caused by insufficient demand for investment. Constraints caused by the latter give rise to overproduction crisis, whereby it does not always mean sufficient quantities of goods. This is a condition of the market when demand for goods is insufficient to

cover the cost of production (Tugan-Baranovsky, 1894). The modern global financial crisis proved that the said conclusion is of current concern. The recipe for crisis tackling elaborated by Tugan-Baranovsky is of current interest, too. The recipe is to generate such increase of the capital of a country, which induces additional sustainable demand. Stimuli for national saving and innovation investment are the factors which require today's core attention.

“Tugan-Baranovsky's researches, as pointed out by A. Hansen, contain the sources of a new trend of economists from the continental European; it absorbed other inflows..., that movement finally generated a new theory that had been generalized by Keynes”. J. Keynes expressed words of memory about Tugan-Baranovsky by naming him to be the first and unique author of that scientific school (which involves such figures as Spiethoff, Lecsure, Schumpeter, Cassel), which Keynes himself likes a lot” (Hansen, 1959). It is commonly known that the core idea of that Keynes' theory, which was recognized to be revolutionary and made public by Keynes in 1936, was the proposition that purchase of investment goods (investment) is a component of aggregate demand, which is a compensation expense of the savings; the market sets an interest rate, at which investment will be equal to the amount of saved income in a closed economy. It is obvious that the said proposition was similar to the theoretical finding made by Tugan-Baranovsky 40 years before Keynes did.

Tugan-Baranovsky elaborated a new market theory when researching theories and phenomena of business cycles. The findings of his research were published in his mentioned book entitled *Industrial Crises in Contemporary England, Their Reasons and Influence on Public Life* (Tugan-Baranovsky, (1894). That work made him a classic of the world economic thought of planetary renown. The second edition of this work (1900) was translated into German (1901 and 1969), French (1913), Japanese (1931 and 1972), English (1954) and Italian (1985). Five editions were published in Russia and Ukraine. A. Hansen made a correct assumption that this work was bound to start a new epoch of the theory of industrial cycles (Hansen, 1959).

Ideas of this book go beyond the topic set out therein due to its significance to the economic science, because it compiled all key issues of the macroeconomic analysis as if accumulating them in a single focus. Indeed, answer to the question “Why do economic crises occur in the market?” result in distinction of economic doctrines even today.

Joseph Schumpeter later named Tugan-Baranovsky’s book as a pillar in the history of economic science. That statement originates from his fundamental work “History of Economic Analysis”, in which Schumpeter, in his definition of the origins of cyclic fluctuation theories, came to the conclusion that a common methodological basis of most theories, which seemed different at a glance, developed at the turning point of the two centuries. That basis was the argument that the major factor of cyclic fluctuations was, first of all, dependent on the nature of fluctuations in production of “plants and equipment” or “capital goods”. Schumpeter acknowledges this to be an accomplishment of the economic thought of that period of time: “we may associate the said accomplishment - or a predominant part of the accomplishment – with the work of Tugan-Baranovsky. This is recognition of an extremely important core fact which ascertains the historical merit of this work” (Schumpeter, 1954).

It was not accidental that Tugan-Baranovsky's work obtained such recognition because it presented a critical review of all dominant concepts of that time. Also it was a unique attempt to give statistical evidences of a reproduction cycle. His analysis of the economic crisis theories categorized them in three groups: critics of theories that relate the cause of crisis in production disturbances, theories that view exchange as a cause of a crisis, theories that find factors of cyclical fluctuations in consumption and distribution. That research underlay a number of fundamentally new heuristic propositions for the key economic categories – cost, price, interest, employment, consumption and saving, accumulation and investment, capital formation, business cycle phases, economic growth, etc.

A line of the business cycle theory, which was represented by M. I. Tugan-Baranovsky, was also named a vertical maladjustment theory proposed by Haberler in 1963. It means a situation when the structure of production does not correspond to the decision of consumers as to spending and saving (horizontal maladjustment relates to the decisions of consumers as to expenditure between various lines of goods). In his work *Equilibrium Business Cycle Theory in Historical Perspective*, K. Kim finds the line of economic thinking adopted by Tugan-Baranovsky to be a main theme of nonmonetary business cycle theories of the 20th century” (Kim, 1992).

M. I. Tugan-Baranovsky’s theory had a significant impact on the formulation of the economic doctrine of industrialization in the Soviet Union. An in-depth analysis to this fact of little notice was carried out by Sergio Amato in his comprehensive work dedicated to the works of the Ukrainian classic. In his work he particularly pointed out that all of the old guard of Bolsheviks, from Lenin and Trotsky to N. Bukharin, Yu. Larin, A. Kraitsman, E. Preobrazhensky, Yu. Pyatakov and I. Rubin were well aware of Tugan-Baranovsky's famous book; that made a mark in the development of “universal economic law of socialism” on the growth of production of means of production. The author recollects that American scientists used a label adopted by Bukharin – Applied Tuganism (which sounds less abusive in English than in Russian) – to describe the Soviet theory of super-industrialization of the 20-ies (Amato, 1984).

Nonetheless, another part of Tugan-Baranovsky’s theory could not be accepted by ideologists of socialist political economy. H. W. Spiegel in his fundamental contemporary book *The Growth of Economic Thought* described it in the following way: "Among neo-Marxists and Soviet scientists, Tugan’s ideas were often a target of attacks due to his refusal of the insufficient consumption theory and proposition that no constraints existed for the capitalist growth due to uninterrupted expanded capital reproduction” (Spiegel, 1983).

Innovation Theory of Economic Development

M.I.Tugan-Baranovsky's ideas on the business cycle theory, in fact, became the foundation and cornerstone of the origin of the innovation theories of economic development that were paradigmatically formed on the basis of Schumpeter's Theory of Economic Development. The theory assumed its final formulation only in the middle of the twentieth century (Bernal, 1956) (Bell, 1988). Until then, majority of scientists had not considered the scientific progress and technological development as a major factor of cyclic and institutional economic development. For a long time, economists found psychology of market actors, whose rational-subjective behaviour constantly distorted the balance of supply and demand resulting in sudden boom and drastic destructive crises in the development of industry and commerce to be the reason for business fluctuations.

M.I.Tugan-Baranovsky analyzed different approaches to explanation of the cyclic nature of production development and argued that inherent properties of economic systems that actually generated cyclic nature of the development, rather than external restricting factors, were the constraint for uninterrupted cumulative development of production. Such properties are cyclical regularities of the reproduction of the national fixed capital. This argument was proposed based on theoretical analysis and close statistical research of peculiarities of the industrial development in England. He showed that the industrial cycle correlated with the iron price dynamics: as long as sales became more vigorous, price for iron increased, whereby the decrease in that price showed crisis and response. The correlation is explained by the fact that iron is one of the most essential materials for manufacture of machines, tools, rails, ships construction and any instruments and transport whatsoever. According to the demand for iron and to its price, we can make a conclusion about the accumulation of the country's fixed capital (Tugan-Baranovsky, 1997).

M.I.Tugan-Baranovsky's business cycle theory was unexpected for his contemporaries, especially his argument on the relationship between the investments

in new production and aggregate demand of the country. According to his theory, during the growth years production expands due to the increase in people's consumption, but it is people's consumption that increases at this period due to increasing fixed capital and extending appropriated production. It seemed paradoxical that a periodic change of influx and reflux in the industry dynamics were caused not by the laws of consumption but by the laws of the production accumulation. It is a total merit of John Keynes that the said argument was widely accepted. This conception of economic processes remains highly relevant for the modern times.

M.I.Tugan-Baranovsky himself described the essence of his theory using a metaphor, specifically an analogy with the operation of a steam engine: the steam pushes the piston, it moves, it performs its work, it lets the steam out and returns to the original position in order to repeat this cycle uninterruptedly. The steam, in this case, figuratively represents loan capital, which is transformed when new technologies are introduced in production, thereby causing movement of the piston, which is an analogy of economic development. This process, as shown by Tugan-Baranovsky, is cyclic because there is a separate phase of the loan capital accumulation that corresponds to recession, and a separate phase of investment of that capital in the development of new industries, which corresponds to expansion. An important methodological discovery is a conclusion that the crisis phase and the corresponding investment restriction and accumulation of disposable loan capital were caused by technological exhaustion of existing industries, when reproduction of old industries became unprofitable for investors, and appropriate funds, after flowing out of the industries, were accumulated in the form of disposable loan capital that searched for a new application.

M.I.Tugan-Baranovsky's ideas quickly became renowned in the academic community of Europe, after the book was translated in German (1901), were developed in the works of A. Spiethoff (1903) and G. Cassel. "In early Spiethoff's articles, - A. Hansen wrote, - you can trace Tugan-Baranovsky's influence on every page. Regarding Cassel, you can see that his ideas and often the way of their

explanation almost fully stemmed out of Tugan-Baranovsky's ideas" (Hansen, 1959). In 1911 Schumpeter's book *The Theory of Economic Development* was published. The author said about that book at the end of his life that by density of the ideas contained the book was of the same value as the major Keynes' work was for Keynesianism. The sixth section of the book is dedicated to the market cycle. Although it does not refer to Tugan-Baranovsky directly (it only refers to Spiethoff), everyone can see that there are numerous arguments of the Ukrainian scientist in the book pages.

The modern fundamental work by W. Rostow *Theorists of Economic Growth from David Hume to the Present: with a Perspective on the Next Century*, explains the logic of the theory of business cycles in the following way: "At some risk of oversimplification, the Continental succession is from Tugan-Baranovsky to Spiethoff to Haberler's League of Nations synthesis and then Schumpeter's Business Cycles" (Rostow, 1990). The same names can be found in other modern treatises on the history of economic thought, for example, in Ingrid Rima's major work (Rima, 1991).

The line of the economic cycle theory represented by M. I. Tugan-Baranovsky was also called vertical maladjustments (Haberler, 1963). This means a situation where the structure of production does not correspond with the decisions of consumers about the costs and savings (horizontal maladjustments associated with the decisions of consumers only in relation to different types of costs). K. Kim in his *Equilibrium Business Cycle Theory* considers the line of economic thought initiated by Tugan-Baranovsky to be "the main theme of nonmonetary theories of business cycle in the twentieth century" (Kim, 1992).

Tugan-Baranovsky's theory of industrial crises produced a direct impact on the formation of the "long waves" theory by N. D. Kondratiev, who was a grateful disciple of Mikhail Ivanovich. This fact is overlooked by modern scholars when studying "long waves", but the transcript of the discussion of Kondratiev's report at the Institute of Economics in 1928, published in 1989, convincingly evidences the

genetic relation between these two theories. The opponents directly pointed out that Kondratiev's vision on crisis is that of Tugan-Baranovsky (Big Cycles, 1989).

When responding to remarks of his direct transfer of Tugan-Baranovsky's theory on his big cycles, Kondratiev said himself: "It is true that there is a certain relationship between my concept and the concept of Tugan-Baranovsky. But it is also true that there is no simple transfer of Tugan-Baranovsky's theory here. I consider Tugan-Baranovsky's ideas on the accumulation of disposable capital and role of such accumulation to be highly efficient. As regards other aspects, my concept is deeply different from that of Tugan-Baranovsky. And in my opinion there is nothing wrong to rely on opinions uttered before and considered as the right ones" (Big Cycles, 1989). Without going into this subject, it can be noted that it is the very part of Kondratiev's theory associated with the peculiarities of the capital accumulation in new industries that became crucial for its further development in the modern Neo-Schumpeterian theories of innovation and technological paradigms.

M. I. Tugan-Baranovsky's cycle theory explains why there are certain periods, during which large amounts of loan capital are initially accumulated, without being applied, followed by a period of boom investment. Then it is arise question: What objects have become new targets of this virtual capital to overcome the crisis? The answers are generated by the innovation theory of economic growth. As noted, development of M. I. Tugan-Baranovsky's theory was continued by the works of A. Spiethoff and J. Schumpeter.

Arthur Spiethoff's researches (Spiethoff, 1903) argued that the growth phase of the cycle cannot be caused by the pressure of loan capital only. Moreover, this phase is mainly due to the result of "attraction" rather than "push." The force of "absorption" of loan capital is the outcome of scientific and technological development, which finds its application in production. Therefore, the growth phase can come to the end not only as a result of cut in the supply of the disposable capital that seeks investment opportunities, but also in case of decline in effective demand

for the real capital. These two interacting reasons determine the basis of cyclic development.

The impulse for investment arises from the need for machinery and equipment manufacture caused by new technological improvements and inventions, as well as new markets. Inventions and technological progress enlarge the "basket of capital formation" and cause urgent need to fill it. The basket capacity is dependent on the requirements of technological progress. But as soon as the basket is filled, all additional formation of a new capital rapidly becomes useless, the marginal efficiency of the capital goes to zero, investment stops, the boom abruptly comes to an end.

Tugan-Baranovsky's argument, that the industrial cycle is mainly caused by the fluctuations of the disposable loan capital, has been developed by A. Spiethoff in relation to the trends of such investment, namely in new equipment and machinery, i.e. scientific and technological progress. M. I. Tugan-Baranovsky's theory was completed by A. Spiethoff's mechanism, according to which commercialization of scientific and technological achievements induces filling of the investment vacuum that had originated in the crisis phase of the cycle. That process proved to be impulsive and that was what gave rise to cyclical nature of economic dynamics.

J. Schumpeter completed formulation of the integrated innovative theory of economic development and thus completed the conceptual line initiated by M. I. Tugan-Baranovsky, and became a recognized "father" of the innovation paradigm of social and economic development. Today, the paradigm is recognized through the so-called endogenous growth theory. Joseph Schumpeter became the author of the cycle theory based on the nature of the innovation process, more specifically on attributes of business behaviour of innovative entrepreneurs, which are opposed, as antithesis, to another type of business entity - "simple owners". The nature of actions of the two types is quite different.

A conceptual argument presented in J. Schumpeter's theory, which makes a distinguishing mark between J. Schumpeter's theory and A. Spiethoff's theory, is that

the new, as a rule, does not stem from the old, yet emerges beside the old, forces the old out and changes all relations so that a specific process of 'placement' is required. Thus, a structural reorganization precedes the growth. Following development is not a mere continuation of the previous development, yet a new development which stems out of new conditions and often among different people.

J. Schumpeter provides an important explanation why new productions and innovative entrepreneurs emerge not uninterruptedly, but immediately and in large quantities, i.e. as a cluster. The explanation is that emergency of new firms is interrelated. That relation is caused by that a breakthrough is originated by a few innovative entrepreneurs that have a special gift of seeing and implementing new ways and possess strong will to handle eventual inertial resistance of traditions. When one or more innovative entrepreneurs emerge, emergency of others becomes easier. Emergence of the others, in its turn, causes emergence of more entrepreneurs, and so forth. In fact, J. Schumpeter believed that an innovative entrepreneur itself does not “invent” and does not “create” new opportunities. Such opportunities exist by themselves, accumulate and are even promoted by printed medium. However, they will not be implemented without an entrepreneur. So, its exclusive function is to implement new opportunities. This is the reason why we should not confuse the “type” and “behaviour” of an entrepreneur and an inventor.

A special focus in the world economic theory is given to the notion of innovation that was developed by J. Schumpeter. That notion has become a common category in the world literature in economics. According to J. Schumpeter, innovation is not merely something newly introduced, yet a new function of production. It is a change in the technology of production, which is historically essential and necessary. The innovation involves a jump from the old production function to the new one. Huge innovations allow for creating new firms and new equipment. However, not everything introduced, not every new production represent an innovation.

The abovementioned vision of social and economic process is still less common in literature. More attention is given to theories that explain business cycles

by influence of other factors, rather than innovations, which are more common and comprehensible. Such factors include investment, seasonal fluctuations of farm crops, specific peculiarities of cash turnover, demographic development, etc. All these factors are important. Nonetheless, the essence of the theories of innovation is that they have proved that technological innovations are the cause of macroeconomic changes, especially in economic growth models, not the effect of such changes.

How should the common factors of the innovating process be considered in building new market relations? The answer to this question is found in the advanced experience of developed countries, which give utmost consideration to these factors. We try to copy the experience, yet often fail to see all causes and effects of this or that organizational form, which is why we don't succeed in getting an expected outcome. In this context, we will review the general essence of a few major arguments of the theories of innovation on how the economic mechanism that is acceptable for scientific and technological innovations is created in the contemporary environment.

If we review this point of time in term of its location in the business cycle wave, obviously we are found in the phase of recession recovery. This is why it is important to identify processes which cause the shift for the growth and actions which are required to succeed. The first thing to note is a jump transition from the old technical basis of production to a new one during the recession phase of the cycle. This is the period when the new basis emerges at the same time as the old basis. This argument should be stressed that this is not a transition from the old to the new, but a jump when the new and old technological bases co-exist. Therefore, the economic policy must be appropriately differentiated. In order to ensure development of new industries which will make the future image of industries, it is necessary to adopt a priority-based tax scale and direct financial aid. According to J. Schumpeter and G. Mensch, when the market relations are largely established, it is natural that preference is given to the innovations that improve rather than crucial major innovations which involve most risks and are more expensive. Implementation of the

essentially new is a special event, which requires unordinary efforts and unordinary people. So, in the environment of this country this process requires not powerful management in the form of commands, yet powerful Government's support of those who successfully start up a new business.

The State's support of innovative development should focus on those entities, which produce the required effect, which managed to create a competitive product. In this country, a narrow command stratum of managers often plays the role of such innovative entrepreneurs; such managers are not directly connected with the outcome; the motivation of their actions involves risks. In the market economy, innovative entrepreneurs represent a large stratum of people that aspire to succeed, whom the State only helps without commanding them. The winner should be the one who ensured the best outcome rather than that who was selected by a governmental officer.

It should be remembered that the command and administrative economy lost the historical competition, in which the market system of resource distribution is the winner. The reason for the competition loss was primarily lack of opportunities for innovative entrepreneurs to do independent effective actions, a cobweb of governmental bureaucracy impending over innovative entrepreneurs, which hampered their evolutionary inventions and self-actualization in the production process. The practice adopted by developed countries proved that the most efficient force to stimulate technological changes is a market competition, in which the government intervenes in order to protect and support such market entities that take the burden of innovation initiatives.

The State's attempt to keep supporting the old economic structure had the only effect - it worsened the recession, because such policy reproduces the said mechanism of disposable capital accumulation. Many circulations largely out of the industry sector causes the maintaining of inflation perspective, which, during the latest years, has been combated by administrative activities by restricting cash supply

by way of delays in payment of salaries and pensions, which is not a market-related measure.

3. Neo-Schumpeterian economic theory

Neo-Schumpeterian theories have been developing above mentioned approach and they can be classified as the economic theory of technological dynamics. We consider this theory among latest achievements of economic thought connected with the development of new paradigmatic path of Schumpeterian tradition – evolutionary technological dynamics (Nelson, 1995; Freeman and Louka, 2001; Perez, 2002; Dosi, 2001; Malerba *at al.*, 2003; Andersen, 2009). Technological changes are regarded here as the main material object – the species that dynamically develops by itself and determines the ways of evolution of the human civilization. Waviness of this process is described by Kondratyev’s theory of “long waves” (Tylecote, 1992; Freeman, Clark, and Soete, 1982; Freeman and Louka, 2001; Rumjantzeva S., 2003) but we consider more productive the approach which concentrates less on the fixation of precise time-points of phases of this wave, studying the essence of the process and its reasons. In this sense it is more important to recognize the technological changes which condition structural reconstruction of the economy as a main factor that have been causing the “long wave” of economic development.

The cyclical periodicity depends on the frequency of appearance and putting into operation of basic innovations, leading to the creation of branches-locomotives of the general development and their further spreading in the economy. Today among such “locomotives” we see the branches that are connected with information technologies (Castells, 1996-1998: 2000-2004; Freeman and Louka, 2001). The Development of the Neo-Schumpeterian conception created a theoretical basis for a new vision of the basic principles to ensure a countries’ economic development and set new requirements to the state economic policy (Elgar Companion to Neo-Schumpeterian Economics, 2007). This new vision is connected with perception of

the national economy's structure as a phenomenon occurring from the different waves of technological complexes. But in many cases of policy analyses we can meet domination of more traditional vision under consideration the characteristics of structural change.

As a rule it is structure of enterprises according a form of property, dynamics in the context of interrelations of various economic indicators and sectors: commodity or service production, creation of added value, investments, such kinds of activity as the capital flows, final consumption, export, import, etc. Such analysis reveals connections between different parameters of the economic system, establishes certain regularities suitable for international comparisons, etc., but it is limited for the tasks of strategic planning of the state economic policy as it does not give a clear vision of the influence of established structural processes on the future state of the economy. So a more modern instrument of analysis is the vision of structural dynamics of production through regularities of technological change.

Development of this Neo-Schumpeterian approach and putting the category of technological system as the basis of long-term cyclic economic development on the center of contemporary economic policy to ensure sustainable growth of national economy are connected with the names of C. Freeman (Freeman, 1982, 1987), D. Dosi (Dosi, 1982, 1984, 2001), C. Perez (Perez, 2002), Andersen, 2009. By developing the ideas of J.Schumpeter and G.Mensch (Mensch, 1979) as to the influence of basic scientific and technical innovations on the long-term economic dynamics, C.Freeman, Clark, J, and L.Soete introduce the notion of a technological system, the change of which happens as a technological revolution. The latter is understood as the total of economically and technologically connected innovations which make up a new technological system (Freeman, Clark, and Soete, 1982). Technological revolution results in drastic changes in the leading trends of the state system of technological paradigms that influence all important sides of economic functioning (Perez, 2002).

Social and technological paradigms are considered to be the reasons for Kondratiev's "long waves". That's why their numeration depends on the numeration of the "long waves" above. Carlota Perez identifies six paradigms - five are realized and the sixth one is still ahead. The key factors of these paradigms are: for the first long wave (1790-1850) – substitution of machinery for handwork in weaving; for the second long wave (1851-1895) – coal mining and the steam engine; for the third long wave (1896-1946) – iron industry; for the fourth long wave (1947-1989) - energy (oil and organic chemistry products); for the fifth long wave (1990-2040) - microelectronics; for the sixth long wave (2041- ?) - biotechnology. It should be noted that the key factor of a certain paradigm is also effective for the technologies that appeared in previous paradigms though it changes their technical quality.

The key factor concerns mass demand for corresponding technical changes. That's why the leaders of the global community master these technologies in advance. The branches that actively use the key factor and adapt its most successfully to the requirements of the corresponding production organization, are the main investors in advanced technologies and form the technological paradigm of the society. In this context, these branches play the role of priority branches. Understanding of the main peculiarities of development and change in technical and economic paradigms and their connection with institutional structure of the society is an important factor of economic policy formation. Specific features of the new technological paradigm, having been determined, show the way of looking for goals and ways of strategic support of its development in the country.

The theory of technological paradigm has created a conceptual basis for a new looks at the cyclical nature of economic development and formed specific requirements for the goals and methods of the anti-crisis state policy. This new vision is related with the statement of the availability of macro-economic life cycle of a definite production structure of the national economy. This cycle is directly dependent on the genesis, development and degradation of the technological basis of social-economic evolution, which changes in the course of time in a cyclical way,

when every sinusoidal wave is caused by a life cycle of the new technological paradigm. Thus, an important instrument of analysis and methodology of anti-crisis policy formation is the evaluation of the structural technological dynamics of the macroeconomic processes and regularity of development of technological systems, which are presented in the modern statistics by evaluations of technological levels of economic activity by the degree of innovation and scientific capacity.

The most common explanations in the expert evaluations of the nature of the present-day financial and economic crisis concern the extent of different types of credit expansion during the last pre-crisis years. That is, the situation is conceptually seen in such a way that the main problem is the gap (the formation of excess) between the volume of broad money supply and the volume of production in the real sector, both in the world in general and in individual countries. But in reality, money always has a credit nature ("money is the future" – J.M. Keynes), and this is especially true of modern money that may be created in unlimited quantities by technological ways. So the search for the causes of the crisis only in the financial and credit sphere cannot give correct orientation. In this context, the Neo-Schumpeterian theory of technological paradigm turns the attention of politicians to the problems of production sphere, the modernization of which may be hindered by the lack of innovative perspective for the creation of absolutely new productions and industries. The theory of technological paradigm links the way out of crisis with the absorption of the mentioned excess money supply by new innovative productions, as it cannot be done by traditional production structure.

4. Conclusions

The innovation theory of economic development was forming as one of the economic cycle's conceptions. The genesis and rising of this theory continue during all XX century and now is actualized by the current economic and financial crisis. Up to that and until now, the majority of economists had not regarded the technological

change as the main factor of cyclical and general economy development. One among the first who recognized the reasons of economic crisis in peculiarities of fixed capital reproduction was outstanding Ukrainian economist M.I.Tugan-Baranovsky. He analyzed different approaches to the explanation of cyclic character of production development and made a conclusion that the obstacles to the continuous stable growth appear mostly not by the external factors (shocks), but from the inner characteristics of the economic system, which mould the cyclic character of its development. Such characteristics include cyclic regularities in the innovative reproduction of the fixed capital of the country.

The cycle theory of M.Tugan-Baranovsky explains why there exist different periods, during which at first big masses of borrowed capital, which cannot find their appliance, are accumulated, and then these masses are impetuously invested. A. Spiethoff supplemented the theory of Tugan-Baranovsky with the concept of the means of filling of the productive investment vacuum, which occurs in the crisis phase. This process turned out to be impulsive, and because of that creates the cyclical economic dynamics. The formation of integrated innovation theory was completed by J. Schumpeter, who became the father of the innovation paradigm of social and economic development, which got recognition also in a nowadays through the so-called endogenous theories of economic growth.

Neo-Schumpeterian approach of economic theory developed Schumpeterian vision to conception of technological paradigm. This concept considers long-run cyclical fluctuations as process, when the one technological paradigm of human civilization come to be over and new paradigm starts to mature. The basic reason of such matters concerns a situation when the traditional markets are reaching to the saturation and they have no demand potential to following development. Crisis starts when credit money for the future development of traditional markets change into financial bubbles. This kind of money disappears if they cannot find new objects to investing. New investment goals are as a rule the technological innovations.

Overview of prescriptions to cure the actual crisis showed that much more attention is paid to the neoclassical theories which explain economic cycles by the impact of different from innovation factors, mainly by the visible financial turbulences. But there is a more fundamental basis of current crisis than short-term disturbances due to the subjective incorrect financial decisions that take place in any times, but the mass character of such mistakes emerges when the one technological paradigm of human civilization comes to be over and new paradigm starts to mature. Our analysis shows the innovation technological change and the corresponding structural reconstruction of economy are the means to overpower the recession and to ensure the sustainable economic growth.

Nowadays the theory of technological paradigms is fully proved by practice. All developed and dynamic countries prove the correctness of the conclusions of this theory by efficiency of their economic policy which is built up on these principles. Concerning the transitive countries, as it is derived in the paper, has no other choice of the model of economic development apart from mobilization of all possibilities for the effective introduction of their economies into the technological trajectory of human civilization evolution. However, practical realization of this task will require considerable political and economic measures to form an effective institutional, regulatory, economic and motivating environment which will be able to ensure accelerated development of branches of 5th and 6th technological paradigms.

The world practice confirms that the most effective mechanism of technological changes stimulation is the market competitive environment, where the country interferes in such a way as to protect and support the market players who take the burden of innovational initiative. This is why the country must actively conduct innovation policy. In this context, the current problems for the Central and Eastern Europe transitive countries are the creation of the management structure which would perform evaluation, planning and support of strategic technological changes in the country in accordance with general national interests. The main aim of this organization must be state support of innovational and technological activities by

provision of regulatory and resources base which would condition efficient technological change as a factor of the sustainable economic growth of the country.

Our researches during a long time have convinced us that the Theory of Economic Development of Joseph Schumpeter elucidates the needed ways to provide effectiveness of market transformations to overcome economic crises. In particular, it gives specific understanding of the deep nature of the required economic reforms in transitive countries like Ukraine. Today, what we used to call the "reforms" is actually only repair of existing economic failures but such measures don't give to the country the progressive transformations to guarantee a further progress. Joseph Schumpeter's theory argues that such type of economy, which he calls "circular flow" and "Statics", inevitably leads to financial and economic crisis because in this case the real development is absent. The Schumpeterian approach proves that the economy that focuses on reproduction and development of traditional structures of production is not able to significantly increase country's welfare, for development of traditional competitive markets eventually retards the creation of new value added. By contrast, J. Schumpeter substantiates the conclusion that the steady growth of national income can only be provided by innovative development. This theory explains the "trap" in which Ukraine's economy has found oneself - focusing of policy on increasing the output of traditional industries, even concerning to the labour productivity growth, don't create a powerful innovation technological resources for dynamic long-run development.

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