ANALYSIS OF THE AUSTRIAN SCHOOL OF ECONOMICS BUSINESS CYCLES WITHIN THE FRAMEWORK OF GENERAL PERCENTAGES AS THE NEW PARADIGM OF ECONOMIC THEORY

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ABSTRACT*. The article presents a new approach to the theory of business cycles of the Austrian School of Economics. The approach is based on a new idea of general percentages. The Austrian business cycle theory shall be presented generally. The article demonstrates that the complementary aspect of the Austrian business cycle is insufficiently studied; this aspect manifests itself as a dependency of general interest rate on the market saturation degree. The article discusses the growth phenomenology and a possibility to explain the universal aspect of general interest as well as the emergence of market transformation based on it. The study shows that new aspects of the Austrian business cycle theory have emerged during its analysis with the focus on general percentages. These aspects have allowed to reveal the paradox of the free market and to explain the phenomenon of business cycles better.*

KEYWORDS*: Austrian school of economics, general percentages, interest, business cycle.*

JEL classification*: C02, C58, E22, H12, G01, O40.*

Introduction

Naturally, different questions may be raised when studying the history of economic theories. The aim of this article is to provide the reader with a more detailed explanation of the Austrian theory of business cycles and its impact on the economic thought development. When explaining the issues of economic growth and decline in the 20s and 30s of the 20th century, an important role was played by the Austrian business cycle theory that was later thrown into the shade by the appearance of *Keynes'* epochal book *The General Theory of Employment, Interest and Money* (Keynes, 1964) in 1936.

On the other hand, as it was pointed out by Čiegis, Girdzijauskas (2018), the analysis of the Austrian business cycle theory led to a conclusion that it was impossible to get answers

to important economic questions while remaining within the framework of existing paradigms. This calls for a revision of theoretical methods and a change of the research paradigms.

Therefore, this article shall improve the analysis of the Austrian business cycle theory and focus on general percentages as the new paradigm of economic theory (Girdzijauskas, 2002).

<u>The aim of the article</u> is to reveal and deepen the business cycle theory of the Austrian school of economics and its application in economic policy with the help of the new paradigm (general percentages).

In order to achieve this aim, the following objectives have been set:

1. to study the Austrian business cycle theory and its application in economic policy;
2. to discuss the phenomenology of growth and the phenomenon of market transformation;
3. to present an interpretation of the empirical financial bubble;
4. to study economic growth in relation to the statements of the general interest theory;
5. to analyse the impact of increasing profitability phenomenon on business cycles;
6. to discuss the free market paradox.

Research methods are as follows: systemic and comparative analysis of scientific sources, mathematical modelling, economic logistic analysis and synthesis.

1. Austrian Business Cycle Theory and its Application in Economic Policy

This part of the article shall provide a further analysis of the Austrian business cycle theory and its application in economic policy. This analysis was presented by Čiegis, Girdzijauskas (2018).

The title of the actual pioneer of the Austrian business cycle theory can be attributed to an acknowledged representative of the Austrian school of economics *L. von Mises* (1881–1973). (See Čiegis, 2014 for his significance to the economic thought history). Following *Menger* (monetary theory) and *von Böhm-Bawerk's* (capital and interest theory) insights, *von Mises* in his work *The Theory of Money and Credit* (von Mises, 1981) laid the foundation for the Austrian *business cycle* (Austrians and especially *Rothbard* identified this business cycle with the *credit cycle* and defined it not as a fluctuation in business activities as such, but as a phenomenon of *reoccurring economic booms and cases of bankruptcy* in his book *America's Great Depression* (Rothbard, 1963)) theory and introduced a new *business cycle* theory that was essentially different from other economic theories of this phenomenon (Baader, 2012).

According to this theory, economic crises could be explained by means of false distribution of resources due to inflation. (As *Baader* pointed out, the Austrian business cycle theory is not a theory of excess investment but rather a theory of inadequate malinvestment (Baader, 2012)). Moreover, if freshly spent money is primarily used to credit money, inflation has a negative effect on the "business cycle". Therefore, *von Mises* claimed that ups and downs of business cycles determined by inflation were more harmful than inflation (Gootzeit, 1994). When a government significantly increases prices, the interest rate decreases below a suitable market level that depends on saving. In this situation the vital market price signal, i.e. interest rate, is distorted; misinformation on market opportunities and current investment resources is spread through the market. This artificially low interest rate misleads business

representatives who then make uneconomic investments, which creates increase of inflation. According to *von Mises*, the most significant consequence of inflation that makes business initially approve of it is the fact that product prices appear to be higher than anticipated. Thus, mass euphoria and false sense of general prosperity are created. However, when credit development stops or slows down, investment errors are highlighted as a result of bankruptcy or unemployment. False distribution of capital and employment between various sectors of economy must be corrected. Therefore, an inflation boom must be followed by a recession, i.e. a painful yet essential process when disproportionate capital injections are liquidated, and a return to that investment and production structure which meets consumers' demands and preferences the best is made.

However, central banks inevitably create their business cycle. In *von Mises'* theory, the cycle begins when a bank system (a central bank in the narrow sense, and a bank system that also includes private fractional reserve banks in the broad sense) exogenically expands the amount of money spent by the central bank and pushed interest market rate below the "natural" or balanced rate that complies with intertemporal coordination (White, 1999). Then, more surrounding production methods are chosen that increase transitional stages of the production process. However, these changes in the production structure can only be short-term. *Von Mises* claims that credit expansion may determine a temporary boom. However, this fictitious well-being must eventually end in production decline, a crisis (von Mises, 1981; 1928). Therefore, according to *von Mises*, credit development accelerates the inflation process which sooner or later, spontaneously and inevitably, takes the opposite turn and evokes a crisis or an economic recession during which malinvestments are revealed, unemployment increases, and there is a necessity to liquidate or redistribute resources that have been malinvested (Huerta de Soto, 2013).

A question of how it would be possible to stop this cycle arises. *Von Mises* claimed that because money appeared in a market as a good and not because of a government's order or social transaction, it must be returned to the market. Banking must be assessed as any other branch of industry and it must depend on competition. Therefore, *von Mises* (von Mises, 1981) recommended a monetary regime without the central bank, a "free banking" system with competitive market determination of the amount of money and debt interest rate (White, 1999).

Furthermore, currency must relate to gold with its unimpeded conversion, whereas the central bank should not generate credit in order to increase the amount of banknotes uncovered by gold or foreign currency because it is obvious that the only way to remove human influence from the credit system is to end any further spending of fiduciary money (von Mises, 1981). (The requirement that banks should have a 100 per cent reserve became the focal point of the Austrian credit and economic cycle theory analysis (Huerta de Soto, 2006)). *Von Mises* claimed that the international gold standard is a keeper of strict discipline that soon suppresses any inflation boom.

As *Rothbard* (see foreword to the second Lithuanian translation, von Mises, 2006) points out, economic recommendations provided by *von Mises* to solve economic cycle problems were completely different than those later provided by *Keynes*. During the boom, *von Mises* suggested immediately terminating any bank crediting and money expansion; during recession, he recommended the *laissez-faire* regime because it would enable the restoring forces to begin to operate the fastest. According to v*on Mises*, the worst form of intervention would be sustaining prices and wages (it invokes unemployment), increase of money supply or increase of state expenses in order to promote consumption. To *von Mises*,

recession was the problem of insufficient economy and consumption excess; therefore, it is important to promote economy and saving, and decrease state expenses instead of increasing them.

It is important to note that *von Mises'* faith in his trade (business) cycle theory was not changed by the Keynesian revolution (Kolev, 2016). Even in 1943 he confidently claimed that 31 years after the publication of his book *The Theory of Money and Credit* (von Mises, 1981), there were no logical arguments against the existence of that which was generally called "Austrian trade cycle theory" (von Mises, 1943).

It is important to note that in his most significant work *Human Action* (von Mises, 1963), *von Mises* claimed that the study of economics cannot be approved or rejected based on the analysis of the data obtained through observation, and is *a priori* science such as mathematics, logics or geometry. Many Austrian economists are characteristic of claiming that their theories including the Austrian business cycle theory cannot be "tested" based on empirical data. By contrast, according to *von Mises*, any reasonable question about empirical research cannot be raised without theory (Rosner, Winckler, 1989).

It is important to emphasise *Rothbard's* (1926-1995) contribution to the business cycle theory. (For more information on *Rothbard's* approach towards the essence of the Austrian business cycle theory, see Rothbard, 2009). As it has been mentioned, *Rothbard* defined business cycles not as fluctuation in business activity as such, i.e., how they can be factually explained by means of changing economic data and economic theory, but as a phenomenon of *general shift of increases and declines* (Rothbard, 1963). While explaining this phenomenon *Rothbard* emphasised the business fault cluster anticipating consumer demands, which creates excess investment of money loaned from banks. Therefore, according to his theory, *increase* is a period of bad investment under destruction using inflationary bank credits. This is a period of making business-related errors (Rothbard, 1963). A *decline* is factually a process during which economy adapts to depletion and faults of the increase and restores effective satisfaction of consumer desires by quickly liquidating destructive investments. Some of them will be abandoned, while others will be transferred for a different use (Rothbard, 1963). (For more information on microeconomic details of increases and declines in the Austrian business cycle theory, see Huerta de Soto, 2006; Garrison, 1989, 1978).

Rothbard started his work *America's Great Depression* by introducing the Austrian business cycle theory and comparing it with *Schumpeter's* business cycle theory that, according to him, was well-known as the only grounded doctrine aside from the Austrian one that was integrated into general economic theory (Rothbard, 1963). According to members of the Austrian school of economics, bank credit expansion creates an increase. From *Schumpeter's* (1934; 1939) point of view, it also plays a crucial yet different role, i.e., it finances the cluster of innovation. (It is important to note that *Shumpeter* in his work *Business Cycles* (Schumpeter, 1939) distinguished the following three different models of cycle: 45-60 year *long waves* or *Kondratiev cycles* (named after the Russian scientist *Nikolai Kondratiev* (1892–1938)), 8–11 year *Juglar* cycles (named after the French doctor and economist *Clément Juglar* (1819–1905)) and shorter 3–5 year *Kitchin cycles* (named after the British merchant and economist *Joseph Kitchin* who lived in South Africa (1861–1932)); for more details on these cycles, see Čiegis, 2012). *Rothbard* then applied the Austrian business cycle theory to specific events of the 20s and 30s of the 20th century and named banking the reason of the business cycle. Therefore, it is not surprising that he was strictly against central banking whose appearance caused potential long-term bank credit expansion, which resulted in an additional money reserve for the entire bank system and enabled commercial banks to expand

crediting, for decree money, fractional reserve banking, and was in favour of a 100 percent gold standard and a 100 percent reserve requirement for banks that *von Mises* suggested in his book *The Theory of Money and Credit* (von Mises, 1981). According to Rothbard (2008), such a system should have prevented inflationist credit expansion which, according to the Austrian business cycle theory developed by *von Mises* and *von Hayek*, led to inevitable depression.

Early works of another very significant creator of the Austrian business cycle theory *von Hayek* (1899–1992) were focused on economic theory as such (prices, capital, money, business cycle that he saw as interconnected). He created his reputation of a strong thinker that contributed greatly to economic theory (Boettke *et al.,* 2000). In 1929, *von Hayek* prepared a treatise *Monetary Theory and the Trade Cycle* (see von Hayek, 1966) where he analysed the causal role of monetary factors in the trade cycle (see Vane, Mulhearn, 2005). In 1931, *von Hayek* published a book titled *Prices and Production* (von Hayek, 1967) that was edited and expanded in the 1935 issue. This is one of his most significant and well-known books about *Hayek's* original business cycle theory, which later became known as the "Austrian business cycle theory" (see van Zijp, 1993; Rosner, 1999; Oppers, 2002). (As *Witt* points out (1997), *von Hayek's* business cycle theory in the broader sense can be attributed to the business cycle excess investment school whose followers in alphabetical order are *von Hayek*, *Machlup*, *von Mises*, *Robbins*, *Röpke*, *von Strigl.* Since most of them were from Vienna, it can be said that this school represents the Austrian business cycle theory).

Von Hayek, employing *von Böhm-Bawerk's* concept of "average period of production" (*von Böhm-Bawerk* (1959) defined the average period of production as a conceptual measure of any "average amount of time" used in the production of a product, which automatically led to a conflict with the pioneer of the Austrian school of economics *Menger* (1950) because it opposed his theoretical foundations (Endres, 1987)), *Wicksell* (1970; 2006; 1977; 1978) on natural interest rates (that represent an interest rate when economy is *in equilibrium* (can be compared with economic supply and demand)) and monetary market interest rates (determined by money supply and demand in *time market*) and *von Mises'* (1981) forced saving theory (it became the foundation for *von Hayek's* (1967 business cycle theory; see Garrison, 2004; Steele, 2001) and his explanation of "industrial fluctuations" based on the old British currency school (see Čiegis, 2014), and the insights of *Ricardo* (1953) and *Mill* (1965), strictly analytically explained how credit expansion with no voluntary previous saving decreased market interest rate (loan costs) below the natural norm (return of capital), caused increase of investment, distorted intertemporal production structure thus artificially making it too receptive to capital, and the mistake made (excess investment) should have manifested as recession later (Huerta de Soto, 2013). (Generally speaking, members of the Austrian school of economics were very interested in the relationship between interest rate and production structure that was often denoted by them as negative: the claim that artificial lowering of interest rate created non-sustainably prolonged production structure became the central principle of the Austrian business cycle theory).

To show the relationship between the value of capital goods and their place in the production sequence, i.e., production structure in terms of *time* (which was characteristic of then research in the field of the business cycle; see Witt, 1997), in Chapter 2 of his book *Prices and Production* (von Hayek, 1967 *von Hayek* introduced a new heuristic analytical tool – the Hayekian triangle – that showed the essential linearity of the production process without denying that nonlinearities were important. This Hayekian triangle provide a very stylised way to describe changes (created by the interest rate) in the intertemporal model of the capital

structure by naming the trade cycle as intertemporal absence of coordination (see Polleit, 2013).

As the member of the Austrian school of economics American economist *Garrison* noted, *von Hayek* anticipated a vertically integrated production process where primary production measures were continuously employed in the entire production process (von Hayek, 1967). These "primary measures" indicate unproduced (or non-regenerative) production measures, i.e., labour and land. Since production takes time, production factors must now be intended for producing final goods that will have value only in the future when they are sold. Consumption can be increased by increasing the number of production stages (indirect production). Therefore, this triangle anticipates expenses during each production stage, i.e. from using initial natural resources through production of produced goods and, finally, to the final retail consumption, together with added value of each stage that expands the triangle (Skousen, 2001).

Attention to the temporal production structure shows that the time variable is important in our approach towards how decentralised economy operates to coordinate production activities with consumer preferences, and in our approach towards what is potentially wrong in the coordination mechanism itself. Among other things, the difference between the output value of one stage and the output value of adjoining stage reflects the general expression of intertemporal exchange expressed by market interest rate that determines factual savings and investment as well as factually planned duration of indirect production or the scope of capital in accumulation economy. According to *von Hayek*, the structure of the triangle changes with interest rate; however, if market interest rate drops below the invisible natural rate that reflects the temporal preference of the society, the triangle expands and then becomes smaller (in its most simple interpretation presenting a non-growing economy). As *Garrison* (2001; 2004) points out, the following essential thing is to compare the configuration changes of *von Hayek's* triangle depending on whether they appeared due to saving or monetary policy. Changes of intertemporal preferences redistribute capital between production stages in the direction of increased saving so that economy undergoes capital saving and gradual increase (*von Hayek* formulated the argument of "fundamental truth" which states that it is impossible to sustain increasing consumption without *prior* saving (von Hayek, 1967)); change of credit conditions due to monetary policy, i.e., interest rate lowering due to loan of newly generated money by the central bank, falsely distributes capital between stages, which results in economy undergoing *un*even growth and, finally, an economic crisis (see Garrison, 1990). When the interest rate lowers due to monetary expansions, simultaneous lowering of final goods in demand does not occur. The direct impact of this "interest rate effect" involves prolonged production processes; however, since higher relative prices of final goods as a result of it increase the output of all capital investments, the biggest influence is made to the processes that are the least indirect; thus, "relative price effect" is created (Steele, 2001).

Similarly to *von Mises*, *von Hayek* thought that business cycle ups and downs were constantly created by credit expansion. In his work *Prices and Production* (von Hayek, 1967), *von Hayek*, given his rather pessimistic assessment of bank capabilities to implement suitable policy and, as *Baader* (2012) notes, speaking of "distorted elasticity of the credit system supply" (demand of early production for investment is more elastic in terms of interest rate; thus, lower interest rate resources due to credit expansion are directed to the processes that use capital intensively, thus prolonging production processes), acknowledged instability of the capital system based on credit money and claimed that credit policy mistakes were the main

reason of economic crises. In his book he pointed out that the business cycle occurred due to inflationary credit expansion of the central bank and its transmission in time, which led to false distribution of capital artificially created in the low interest rate market. He believed that in order to control *inflation*, *money supply* had to be strictly controlled as well despite the fact that such measures might have significantly increased *unemployment rates* (see von Hayek, 1972). (This *von Hayek's* thought was sensitive to the Phillips curve. According to Austrian economists, inflation and unemployment is not a compromise that provides a choice for the "society", as was later claimed in the Keynesian theory that was based on the *Phillips curve* that, as it has already been mentioned, was suggested in the 50s of the 20th century by the economist from New Zealand *Phillips* and that reflected the relation between inflation and unemployment (see Čiegis, 2012)).

It is important to note that in 1974, i.e., one year after his teacher *von Mises'* death, *von Hayek* was awarded a Nobel prize in economic sciences for his works (essentially, in the 30s of the 20th century) in the fields of monetary theory and business cycles.

Summing up the Austrian business cycle theory it can be said that *von Mises*, *von Hayek* and their followers based their claims on economic cycles on the following statements (Власов, 2012):

a) business cycles are created by credit emission of the bank system based on fractional reserves (not only for production, but also long-term consumption of goods (e.g., residential spaces, vehicles and appliances), which also changes the structure of economy);

b) lowering of interest rate below the market (natural) level due to credit expansion creates the beginning of the "rising" phase of the cycle;

c) distorted use of interest rate for effectivity calculation of certain production processes misleads entrepreneurs;

d) disorientation of businessmen manifests through false expansion of the societal production structure and prolongation (creation of additional production means); however, the finalising of these processes lacks necessary societal savings that are *sine qua non* of economic growth for Austrian economists;

e) transition of the "growth" phase of a business cycle to "decline" occurs due to insufficient level of societal savings to finish launched investment projects and desire of banks to increase their cash resources;

f) during the "decline" phase, interest rate increase that occurs due to credit deflation and lack of savings leads to businessmen acknowledging their false actions during the "boom" and they liquidate excess production of transitional products for the benefit of final products;

g) prolonging the boom at the expense of even wider credit expansion and long-term continuation of such policy lead to hyperinflation and destruction of societal monetary system (for more information on the hyperinflation phenomenon and its destructive impact on a country's monetary system, see Čiegis, 2012);

h) in order to resolve the problem of cycle fluctuations, it is essential to prohibit the functioning of banks with a fractional reserve. Members of the Austrian school of economics saw the solution of cycle crises in prohibiting the practice of the fractional reserve principle in bank activities and ensuring turnover stability based on the gold standard.

2. Phenomenology of Growth and the Phenomenon of Market Transformation

Empirical growth observations show limitations of long-term growth. This allows employing logistic growth models based on the phenomenological methodology. This in its

turn would lead to the formation of a limited top-down (closed) system. We shall use the term of phenomenology mostly in those cases where there is a need to show (emphasise) the operation of a phenomenon in its most general form (macro level). Such is the growth phenomenon defined by the formula of general percentages. The growth of each population is defined on the micro level by its own specific indexes. On the micro level, the growth norm and growth potential, etc. of biological populations (viruses, insects, rodents, etc.) are determined by certain principles, while those of information spread by others, and those of capital and GDP – by others yet again. Meanwhile, all these populations retain the phenomenological principle so that their growth speed is proportionate to their size and grow in the presence of a certain growth limit. This generality shows that the same populations are probably characteristic of other population growth principles as well. Here we are mostly interested in the dependency of productivity (growth norm) on saturation. This is important because such productivity growth may evoke the change of population, formation of a bubble and, finally, burst of the system. This has impact on the development sustainability of any system. In other words, the phenomenological method allows observing growth processes from a different point of view and explain the explosive increase of population known in biology, whereas in economy it is economic overheat, formation of bubbles and appearance of crises. Moreover, such approach towards economic growth allows merging micro and macro processes (merging micro- and macroeconomics) and create an integral (general) economic theory. Summing up, general percentages and resulting increased productivity effect is a phenomenological growth law.

The significance of the phenomenological method shows through when analysing the phenomenon of closed market and relating it to the dynamics (change) of the supply-demand ratio. As the supply-demand ratio changes – especially when the ration transits to the unit value, the features of the market itself change. This change of features creates the market transformation phenomenon, that is, when adaptive market transforms into a non-adaptive market (and vice versa). As it has been mentioned, while demand is lower than or equals supply, the market is open or infinite, that is, it is unsaturated. When demand becomes higher than supply, market capacity becomes limited, and the market transforms into a closed market. Thus, it becomes saturated. The profitability of a saturated market is always higher than that of an unsaturated market, which means that the market has a tendency of overproduction and is not capable to adapt on its own. The phenomenological method helps to detect and understand market relation to supply-demand and its transformation.

Phenomenology was formed in the beginning of the 20th century. The foundations for the development of phenomenology were laid by the Austrian philosopher *Edmund Husserl* (1859-1938) who was seen as the creator of the new philosophy method that was supposed to bring back stability to the civilisation undergoing destruction. Modern science pushes into the background which is subjective (feelings, experiences) and examines only objective phenomena (which can be measured, calculated, verified). Only instrumental research oriented toward quantitative parameters are seen as suitable cognition of reality. During the research, everything is measured, calculated, modelled and later forecast. Immeasurable things such as sense and experience are separated from scientific cognition. Phenomenology does not deny scientific cognition but rather one of the ways to understand the world.

The definition of phenomenology is not yet fully formed and is presented differently by different authors. Recently, the term "phenomenology" is used in the scientific context to describe the entirety of knowledge obtained by means of empirical observation and

comparison of the results. The phenomenological method takes up an intermediate approach between theory and experiment.

According to some authors, phenomenological knowledge means understanding a signal, and theoretical knowledge stands for decoding a signal. Phenomenological knowledge is inherent, while theoretical knowledge is acquired. Science has long employed various phenomenological laws such as *Hooke's*, *Robert Hooke* (1635–1703) was a prominent English physicist of the 17th century whose law stated that the elastic body force is proportionate to its deformation degree); *Fourier's law*, French mathematician and physicist *Jean-Baptiste Joseph Fourier* (1768–1830) formulated the thermal conduction law which states that the transfer of heat is proportionate to the temperature gradient), thermodynamics and other laws. The phenomenological method in logistic analysis also finds its place, i.e., it helps to ground market transformation.

The Austrian school of economics references the conception of the free market. There is a widespread notion that *the free market is a* market where participants act without state intervention, and all actions in it are based on mutual agreement (Čiegis, 2014). This is a system of free and uncontrolled exchange. However, a free market has never existed for a longer period in its net form. This raises doubt in the widespread politicised definition and also forces to look for its rational economic formulations.

The general interest theory suggests a different conception of the free market definition (Girdzijauskas, 2015). It is based on the provision that *a free market is a market where demand is approximately equal or lower than supply*. Meanwhile, *a market in which demand remains higher than supply for a reasonably long period of time is called a deficit market, i.e., structurally constricted or Keynesian market. Say's* law operates in a free market, which is why the demand-supply balance settles on its own. This is a self-regulating market. It raises a necessity to apply the Austrian economic theory to the free market, whereas *Keynes'* theory is more suitable to analyse the deficit market (Moskaliova *et al.,* 2018).

As the diagram in *Figure 1* demonstrates, the free market may transform into a deficit (*limited capacity*) market. Evidently, a reverse transformation is also possible, i.e., a deficit (*limited capacity*) market may transform into a free market if the demand-supply ratio changes.
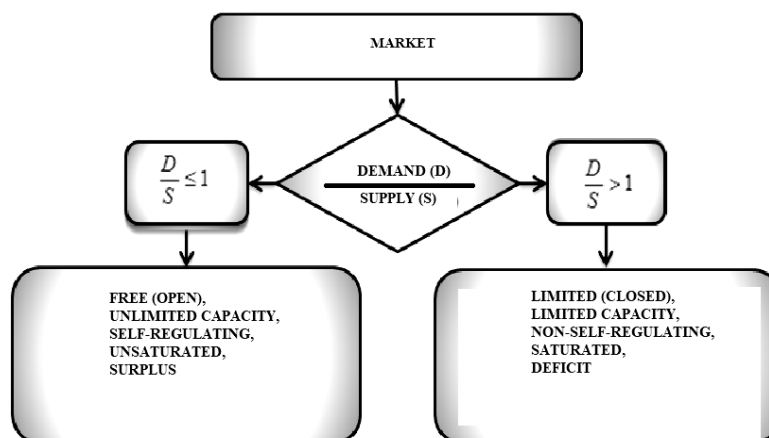
Source: created by authors.

Figure 1. **Market Transformation; Grouping Based on the Demand-Supply Ratio**

In this way, adopting this approach allows classification of markets based on **supply** (*S*) and **demand** (*D*) ratio into **unlimited capacity** and **limited capacity** markets. If $D/S \leq 1$, we have an unlimited capacity market, and if $D/S > 1$ we have a deficit (*limited capacity*) market. Each of these markets have a series of synonyms that reflect their features (see *Figure 1*).

As we have seen earlier, the Austrian business cycle theory emphasises the policy of interest rate and bank credit in general. Therefore, it is important to understand the principles of the general interest theory and their application possibilities. We should note that while discussing the general interest theory, the terms *percentage* and *interest* shall be synonymous. Strictly speaking the term *interest* stands for a debtor's fee for using capital. We shall take a broader approach towards these terms including them as a model.

3. Economic Growth and Unknown Interest

Timely application of the financial bubble theory would allow avoiding many problems or at least assessing their consequences more objectively. The logistic capital management theory based on market saturation explains the bubble development process and is influenced by the behaviour of market participants. Moreover, this theory is based on a new economic growth paradigm (*general interest*).

Modern economic theories are usually based on infinite growth that is modelled according to the compound percentage rule:

$$K = K_0 \cdot (1+i)^t \quad (1),$$

where K_0 – initial investment (initial capital), K – amount accumulated within t periods, i – investment profitability rate, t – investment (accumulation) duration.

It is important to emphasise that, strictly speaking, infinite growth does not exist. Each case of growth ends sooner or later. In economics, the compound percentage rule is successfully applied only for a short-term period. For a long-term period, (still practically unfamiliar) general percentages (interest) must be applied. (General percentages were created based on a model by the Belgian mathematician Verhulst (1804-1849); general percentages in economic analysis (modelling) were first used by Girdzijauskas ((2002). They are the new economic growth paradigm:

$$K = \frac{K_p \cdot K_0 (1+i)^t}{(K_p - K_0) + K_0 (1+i)^t}, \quad (2).$$

where K_p – potential (marginal, maximum) value of invested capital.

It is evident that compound percentages are just a separate case of general percentages because calculating the limit of amount K when potential capital value K_p is growing and becomes infinite, and the general percentage expression becomes the rule of compound percentages. It should emphasised once more that both compound percentages and general percentages model population growth or, in other words, change in time, i.e., they model the dynamics of that population. (It is important to note that a population is a set of objects with features that the researcher is interested in. In this case, the population is the economic index under research).

The diagram of compound percentages is a continuously growing exponential curve, meanwhile the diagram of general percentages has the shape of a horizontally extended letter *S* and never exceeds (goes over) the value of potential capital.

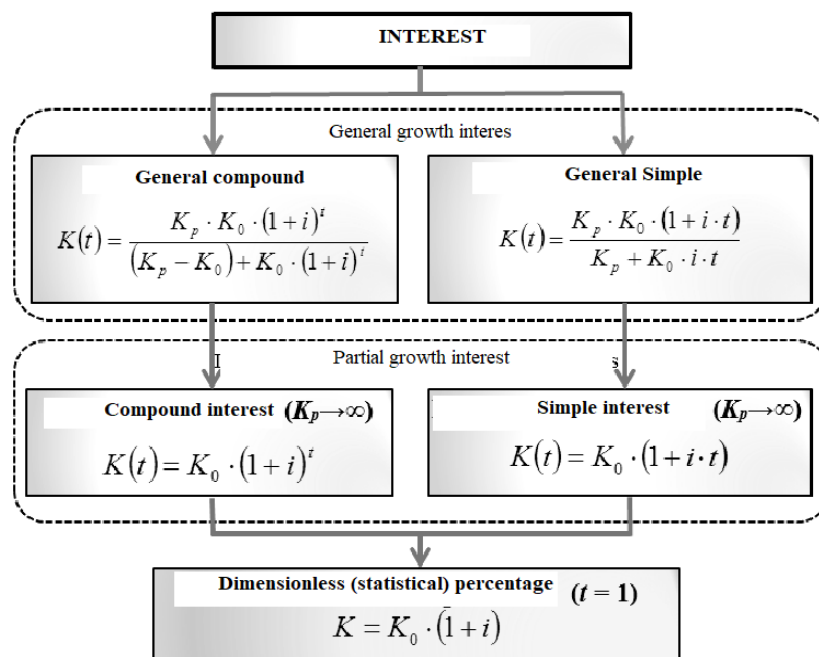## 4. Propositions of the General Interest Theory

Modelling of growing populations revealed that, besides well-known *Malthus'* interest and dimensionless (statistical) percentages, there is also a more general (umbrella) case, i.e., general interest (Moskaliova *et al.,* 2018).

It can be said (Girdzijauskas, 2015) that simplified general interest leads to *Malthus'* interest, and simplification of the latter leads to dimensionless (statistical) percentages. In other words, dimensionless (statistical) percentages are a separate case of *Malthus'* interest, and the latter is an equivalent case of general interest.

It is important to note that such transformations of interest models are not evident or easily recognisable. In 1936, well-known economist *Keynes* developed **the general interest theory** (Keynes, 1964); however, it did not answer many practical questions. **Later it became clear that this theory was limited because it was based on an outdated economic growth paradigm. Of course, this paradigm in many cases has not been replaced yet.**

Malthus' interest – general and compound percentages – have been used to model economic growth for a long time. These are the models of infinite growth. In the beginning of the 19th century, it became clear that infinite growth was incompatible with the processes that occurred in nature and society. Therefore, limited growth models were created. However, those models were not adapted to calculate interest, even though they did model growth.

Almost two decades ago, **general interest** models were created based on limited growth models. The principle of general compound and partially compound interest growth is the phenomenological principle, i.e., growth speed is disproportional to the size of the growing population. The difference is that general interest additionally has a multiplier that limits growth.

INTEREST

General growth interes

General compound

$$K(t) = \frac{K_p \cdot K_0 \cdot (1+i)^t}{(K_p - K_0) + K_0 \cdot (1+i)^t}$$

General Simple

$$K(t) = \frac{K_p \cdot K_0 \cdot (1+i \cdot t)}{K_p + K_0 \cdot i \cdot t}$$

Partial growth interest

Compound interest $(K_p \rightarrow \infty)$

$$K(t) = K_0 \cdot (1+i)^t$$

Simple interest $(K_p \rightarrow \infty)$

$$K(t) = K_0 \cdot (1+i \cdot t)$$

Dimensionless (statistical) percentage $(t = 1)$

$$K = K_0 \cdot (1+i)$$

Source: created by authors.

*Figure 2.* **Structural Model of General Interest**

The signs in the formulas presented in *Figure 2* have the following meaning: $K(t)$ – size of population after t periods, K_p – potential (maximally possible) population value during the time moment t, K_0 – primary (base) population size, t – duration (number of periods), i – percentage rate measured using the same time units as duration t ($i = p\%$, where p – percentile expression of percentage rate if population decreases, $p<0$).

It is also important that it is possible to obtain *Malthus'* (partial) interest from general growth percentages (interest) by increasing potential population value, and from *Malthus'* interest it is possible to obtain dimensionless percentages by eliminating time (if time equals one) (see *Figure 2*). This relation between the models demonstrates that general and partial interests as well as dimensionless percentages comprise a unified system. This allows re-evaluating the impact of interest on the growth process. The newly created structural scheme of general interest is different in that it shows consistent transition from one level to the next.

5. Impact of Increasing Profitability Phenomenon on Business Cycles

General interest opens up new possibilities for economic sciences because it reveals new economic phenomena. One of them is the *increasing profitability phenomenon* that manifests through the fact that when market saturation increases, profitability (internal return) does not decrease but rather increases. This becomes evident when discounting money flows based on the general interest system or simply expressing interest rate i in the general interest formula (see Čiegis, Girdzijauskas, 2018).

Manifestation of increasing profitability phenomenon may be described as follows: initial increase of supply is created due to external factors (advertising, etc.) When demand exceeds supply, the market becomes deficit (limited capacity) and can be saturated. Prices increase as deficit increases. The higher the deficit, the higher the saturation and the higher the prices. Therefore, *increasing profitability phenomenon* begins to operate in the saturated market.
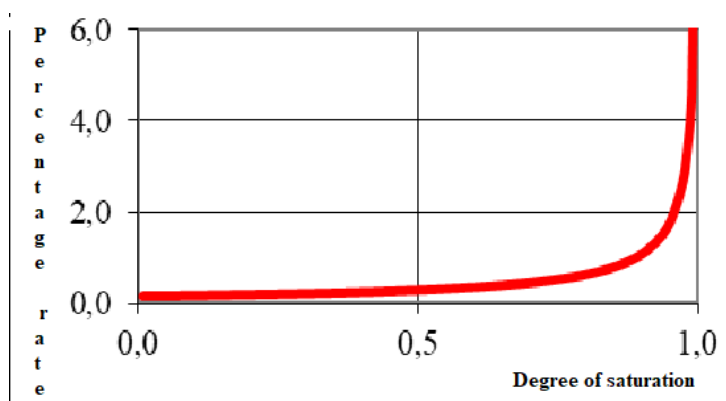
Source: created by authors.

Figure 3. **Dependency of General Interest Productivity Rate on the Degree of Saturation, when $K_0 = 0.75$, $K = 1$, $t = 2$, $i_0 = 15.5\%$**

The diagram in *Figure 3* shows that profitability increasingly speeds up (hyperbolically) as saturation increases. The increasing profitability effect directly impacts business cycles and creates an assumption for the theoretical explanation of the financial bubble. Here markets are usually assessed within the framework of saturation (see Čiegis, Girdzijauskas, 2018).

6. Free Market Paradox

As we have mentioned, a free market can be analysed from various aspects, i.e. political, economic and others.

There is a widespread political notion that the free market is a system of unregulated exchange where participants act without state intervention, and all actions in it are based on mutual agreement (Čiegis, 2014).

Meanwhile, from the general interest theory point of view (economic aspect), a free market is a market where demand (D) is approximately equal to or lower than supply (S). This is a balanced, reasonable surplus and reasonably deficit market.

A market where demand remains higher than supply for a sufficiently long period of time is called deficit, i.e. structurally limited capacity market or Keynesian market.

Thus, if $D/S \lessapprox 1$, we have an unlimited capacity market, and if $D/S \gg 1$ we have a deficit (Keynesian) market. Appearance of a deficit market is based on uncontrolled investment, aim for high profitability, speculative activities, existence of a long technological cycle investment, etc.

According to the political definition, it can be said that without state intervention and investment limitation, deficit markets form easily; these markets are more profitable in comparison with free (surplus) markets.

From the economic standpoint, a deficit market is more limited than a free market. In the investment process, a deficit market is *subjected to* profitability growth (active speculative activities in the market), *does not see* the forming hidden reproduction, and thus cannot self-regulate.

A free market, on the other hand, is less profitable but is easier subjected to market signals and does not allow reproduction.

Free market paradox: the more a market is politically free, the more limited it becomes from the economic point of view.

Conclusions

1. The member of the Austrian school of economics *von Mises* can be seen as the true pioneer of the Austrian business cycle theory; in his work T*he Theory of Money and Credit*, he introduced a new *business cycle* theory that was different from other economic theories on this phenomenon.

2. It is important to emphasise *Rothbard's* contribution to the business cycle theory. He defined business cycles not as fluctuation in business activity as such, i.e., how they can be factually explained by means of changing economic data and economic theory, but as a phenomenon of *general shift of increases and declines*.

3. In his book *Prices and Production* (1931), *von Hayek* introduced an original business cycle theory, which later became known as the Austrian business cycle theory.

4. Markets may be distinguished into free (unlimited capacity or self-regulating) and deficit (limited capacity or non-self-regulating). *Say's* law operates in the free market, whereas this law does not apply to the deficit market.

5. The Austrian business cycle theory can be applied to the free market, whereas in the deficit (limited capacity) market this theory is limited. In other words, propositions of the Austrian school of economics are suitable for the free market, whereas *Keynes'* theory is more suitable for the deficit market.

6. As the supply-demand ratio changes, market of one type may transform into a market of the other type. This transformation is related to the business cycle. The reason for the appearance of business cycles is the formation of deficit (saturated) market and appearance of the financial bubble.

7. Separate stages of business cycles can be modelled with the help of the general interest model.

8. The Austrian proposition that business cycles are created by credit emission of central banks is true, especially considering the fact of how much this credit polity promotes consumption, especially speculative.

9. General interest models support the Austrian proposition that during recession it is important to follow the strict *laissez-faire* regime as it allows fast operation of restorative powers.

10. The free market paradox can be described as follows: the more politically free a market is, the more limited it becomes from the economic point of view.

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Guest Paper

AUSTRŲ EKONOMIKOS MOKYKLOS VERSLO CIKLŲ ANALIZĖ TAIKANT BENDRUOSIUS PROCENTUS KAIP EKONOMIKOS TEORIJOS NAUJĄJĄ PARADIGMĄ

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SANTRAUKA

Straipsnyje pateiktas naujas požiūris į austrų ekonomikos mokyklos verslo ciklų teoriją. Požiūris grindžiamas nauja bendrųjų procentų idėja. Apibendrintai pristatoma pati austrų verslo ciklo teorija. Straipsnyje atskleidžiama, kad egzistuoja iki šiol nepakankamai ištirtas austrų verslo ciklo papildymo aspektas, pasireiškiantis kaip bendrųjų procentų augimo normos priklausomybė nuo rinkos prisotinimo laipsnio. Aptarta augimo fenomenologija ir galimybė jos pagalba paaiškinti bendrųjų palūkanų universalumą ir rinkos virsmo fenomeno atsiradimą. Atliktas tyrimas leido padaryti išvadą, kad austrų verslo ciklų teorijos analizėje orientuojantis į bendruosius procentus atsiskleidė nauji jos aspektai. Jie išryškino laisvosios rinkos paradoksą ir leido geriau paaiškinti verslo ciklų fenomeną.

REIKŠMINIAI ŽODŽIAI: austrų ekonomikos mokykla, bendrieji procentai, palūkanos, verslo ciklas.