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NATURAL CAPITAL IN THE ALTERNATIVE THEORIES OF ECONOMIC GROWTH

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Abstract: In economic science, the content coverage and characteristics of natural capital as a determinant of economic growth were often discussed by affirming the paradigm of sustainability at the end of the previous century. The largest number of researchers supported the thesis that economic growth should be sustainable, which means that it does not imply excessive use of natural capital (natural resources and the absorption and regenerative capacity of ecological systems) per unit of newly created value. During the previous years, new growth concepts known as Green growth, Degrowth, Post growth and Doughnut appeared in the explanations of natural capital as a limiting determinant of economic growth. At the core of these concepts is a sharp opposition to the views of neoclassical economists on the possibility of an unlimited increase in economic activities. Among other things, this happens due to the fact that natural capital, as one of the basic drivers of economic growth, is limited and cannot be substituted by other production factors.

Keywords: Natural capital, Green growth, Degrowth, Post growth, Doughnut.

JEL classification: 044, Q01

1. Introduction

Economic growth represents an increase in the value of national production over time. It is measured by the increase in the real gross domestic product of a resident in a certain period of time. Bearing in mind the universal use and the limitation of this indicator of development, numerous authors emphasize that it does not imply anything about social inequalities and environmental problems, which makes it an imperfect indicator of developmentto a significant extent (Milanović, 2016; Piketi, 2015).

The theory of economic growth quantifies the contribution of certain factors to the growth of gross domestic product per capita. The highest rate of economic growth is achieved when the amount of used production factors is maximized and/or the efficiency of their use is increasedto the maximum (Dragutinović et al, 2015).

From the 1970s until today, the most prevalent explanations of economic growth belong to neoclassical thought. Neoclassical theory emphasizes the importance of competition and market liberalization as well as minimizing the role of the state in managing economic activities. According to neoclassicists, economic growth is the key goal of economic development. In a certain way, goals such as social justice, preservation of natural capital and the like were marginalized by neoclassical economists.

Schumacher is the author who first used the term natural capital in his famous work *Small Is Beautiful: A Study of Economics as If People Mattered* (1973). According to him, the main components of natural capital are fossil fuels that are intensively used, on the one hand, and the ability to preserve and regenerate the environment, on the other. According to Harris & Roach (2021) natural capital represents available land and resources, including water, air, soil, forests, fisheries, minerals and ecological systems that support life. These authors support the fact that stocks of irreplaceable natural capital make up a larger part of the available total global capital, while economists mistakenly consider its value-expressed consumption as income.

In the last three decades, the concept of natural capital is often discussed in economic science. Over the past years, the interest of researchers in looking at natural capital as a determinant of economic growth has grown sharply, emphasizing its limiting influence on the intensity of growth of the value of the global gross domestic product in the future. In this context, the views of the so-called alternative explanations of economic growth embodied in the concepts of Green growth, Degrowth, Post growth, and Doughnutare of particular importance. These concepts, in addition to indicating the necessity of stopping pronounced inequalities in the distribution of generated income, the need to find more adequate indicators of the achieved level of development of countries compared to the indicator of gross domestic product per inhabitant, etc., emphasize the necessity of stopping the tendency of unsustainable exploitation of natural capital in the production process.

Starting from the positions of the previously mentioned four alternative concepts of economic growth (Green growth, Degrowth, Post growth, and Doughnut) in the part of treating natural capital as a driver of economic growth, the following research hypothesis was established:

H0: In the alternative explanations of the growth of the latest date of their origin, the position that natural capital represents the limiting determinant of economic growth dominates.

The aim of this paper is: a) indicating the unacceptability of the neoclassical treatment of natural capital as a factor of economic growth and b) elaboration of key dimensions of alternative explanations of growth, especially considering the treatment of capital as a driver of economic growth.

The work is composed of seven sections. After the introduction, in section two, we are talking about the complete neglect of natural capital in the analysis of the economic growth factor by neoclassical economists. In section three, the essence of the concept of green growth is presented, and in section four, the most significant features of the concept of Post growth are explained. Section five is devoted to the concept of Degrowth, and section six to the presentation of the essence of the Doughnut Economics model. Section seven provides concluding remarks.

2. Ignoring natural capital as a driver of economic growth in neoclassical theory

The models of economic growth concerning neoclassical theorists operate with three key drivers of economic growth: physical capital, labor and technological change (Solow, 1956; 1957). Solow even concluded that the world economy can grow without natural resources (Solow, 1974). The category of technological change, in short, includes factors of production other than physical capital and employment. These can be factors related to the improvement of existing and the emergence of new means of production, education or some changes in the organization of work and employment. Neoclassical explanations of the physiology of economic growth start from the assumptions of the manifestation of constant economies of scale, the behavior of economic entities in accordance with the prices established on perfectly competitive markets, the absence of externalities, the existence of technological changes of an exogenous character. They also abstract the possible influence of institutional factors and ignore the potentially stimulating role of public sector management in generating economic growth in certain territories.

Neoclassical economists completely ignore the role of natural capital in generating economic growth. This happens despite the fact that "natural capital plays an important role in the economic growth and prosperity of countries, due to its influence on production, technological progress, trade, employment, improvement of living standards. Available natural capital is also the limiting factor of production. The available natural resources and the vitality of the environment impose practical limitations on economic activities" (Cvetanović, & Andrejević Panić, 2021: 58). Some later versions of neoclassical models of economic growth include natural resources as a production input, under the assumption of its substitutability with other factors of production, which is a complete disregard of economic reality in this matter (Stiglitz, 1974).

A central premise of this viewpoint is that it is feasible to achieve economic growth concurrently with the sustainable management of natural resources. Particularly noteworthy is the Porter hypothesis, which postulates the existence of mutually beneficial outcomes ("win-win") for economic and environmental interests (Porter & Van der Linde, 1995). According to this hypothesis, environmental regulations stimulate entrepreneurial innovation, thereby enhancing business performance across both environmental and economic dimensions (Ambec et al., 2013). Overall, this perspective reflects optimism regarding society's capability to effectively address challenges associated with the excessive exploitation of natural capital.

The neoclassicists claim that the increase in the value of production at the national level is the result of an increase in the quantity and quality of work (through population growth and labor-saving technological changes), an increase in physical capital (through savings and investment mechanisms), as well as an increase in the technological level of production (through own research and development activities or knowledge transfer and technology) (Baro, & Sala-i-Martin, 2004). Less innovative economies, *ceteris paribus*, have more moderate rates of economic growth compared to regions characterized by more advanced territorial systems of innovation, a competent educational system, etc.

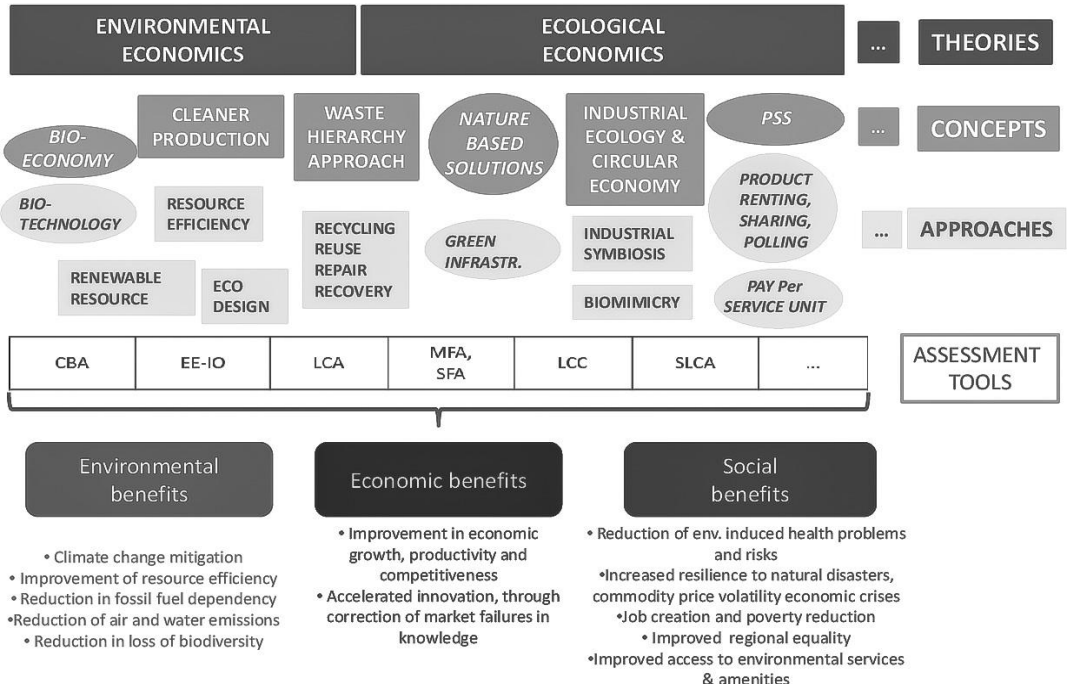
3. Green Economy and Green Growth

The theoretical starting point of the green economy is environmental economics and ecological economics. A central analytical category of environmental economics is the concept of externalities (Pigou, 1920). The strategy led by environmental economics is exact pricing ("internalization") The theory of externalities provides an economic framework for analyzing the costs of environmental degradation caused by economic activities or the social benefits created by economic activities that improve the environment. The ecological economics perspective is based on the view that there are limits to the substitutability of natural capital and man-made capital and that, at least, certain (critical) stocks of natural capital must be maintained. It models socio-ecological systems by analyzing cause-and-effect relationships and dynamic processes with the environment. Great emphasis is placed on changes in the economy and society in order to create social and economic systems that are less destructive to nature (Williams, & Millington, 2004). A fundamental principle of ecological economics is the view that human activity must be limited by the carrying capacity of the environment. For this purpose, physical or environmental indicators (e.g. material input per unit of service, ecological footprint, critical natural capital) are developed based on the concept of dematerialization and preservation of irreplaceable natural capital (van den Bergh, 2001; Ekins et al., 2003; Farley, 2008).

In the ecological economics approach, the production system is viewed as a subsystem of the ecosystem. From that perspective, economic valuation expressed in prices can only partially cover the complexity of ecological processes. This fact, in turn, can lead to serious conflicts with the demands of the ecosystem.

The concept of green economy, in the meaning of the term that is used today, appeared at the Rio+20 Conference (Barbier, 2012). International organizations such as the World Bank (Toman, 2012) and the United Nations Environment Program (UNEP, 2011) see the green economy concept as a kind of a path to sustainability. However, the green economy is related to ecological authors Piercy et al. (1989) in response to the underestimation of environmental and social costs in the current pricing system (Le Blanc, 2011).

Figure 1: Generic framework of the green economy concept



a) Current concepts are marked with boxes, emerging concepts are in circles and in italics.

b) PSS (Product-service system); CBA (Cost-Benefit Analysis); EO-IO (Environmentally-extended input-output); LCA (Life-cycle assessment); MFA (Material flow analysis); SFA (Substance flow analysis); LCC (Life-cyclecosting); SLCA (Social life-cycle assessmen).

Source: Loiseau et al., 2016: 368.

Green economy refers to a concept that encompasses various implications in terms of economic growth and well-being. In order to clarify the connections between economic theories, concepts, practical approaches and tools for evaluating the green

economy, Loiseau et al (2016: 368), created a multi-layered framework known as heuristic green economy (Figure 1).

The term "green growth" is frequently employed alongside, or sometimes interchangeably with, the concept of "green economy" (EEA, 2014). Historically, green growth predominantly referred to the expansion of environmental industries; however, contemporary usage has broadened its scope to encompass overall economic growth (Janicke, 2012). Green growth aims to support economic advancement while simultaneously safeguarding the sustained availability of natural resources and ecosystem services critical for human welfare. To accomplish these objectives, green growth strategies emphasize investments and innovations that foster sustainability and open up new economic opportunities (OECD, 2011). Moreover, green growth is characterized as a qualitative form of growth that efficiently utilizes natural resources, reduces environmental degradation and pollution, and enhances resilience against natural disturbances (Toman, 2012).. These potentially contradictory implications require clarification regarding the ability of green economy applications to support the transition to sustainability.

The green growth concept is based on the view that a growing economy is possible with reduced exploitation of natural resources and at the same time thereduced harmful impact of emissions from growing production and consumption on the quality of the environment. The realization of green growth implies taking measures that have a positive effect on economic growth and development, which at the same time protect the environment and natural resources, by preserving all the natural values that are essential for sustainable development (Loiseau et al, 2016).

The concept of green growth is grounded in the recognition that, provided economic growth continues to represent the primary objective of economic advancement, it is essential to decouple economic expansion from resource consumption and negative environmental consequences. Consequently, green growth shares significant conceptual overlap with notions such as green economy and low-carbon economic development. A crucial driver facilitating green growth is the shift toward sustainable energy systems. Advocates of green growth maintain that effectively designed environmental policies can generate employment opportunities across various sectors, including renewable energy, environmentally responsible agriculture, and sustainable forestry.

The difference between the concepts of green growth and green economy is reflected in the fact that the concept of green economy includes a social component of sustainability, while the green growth model relies only on the ecological and economic component of the sustainable development paradigm (Loiseau et al, 2016). This means that green growth is an instrument of the green economy through which economic growth and environmental protection are achieved at the same time.

Green growth is a way to solve economic and environmental problems that have been present for years, and also to stimulate production based on lower consumption of natural and energy resources and less waste. The concept of green growth means both an opportunity and a threat for the market and the state itself. Green growth is not a substitute for sustainable development. Actually, it provides a practical and flexible

approach to achieving concrete, measurable progress in the economic and environmental dimensions of the sustainable development paradigm, by taking into account the social consequences of greening economic growth.

The focus of green growth strategies is on using natural capital on a sustainable basis. This, among other things, means providing critical support servicesfor sustaining life, starting with clean air and water, more resilient biodiversity, which serves to increase the production of healthier food products and improve the health status of the population. This is important since natural capital represents a limiting determinant of economic growth and this fact must be taken into account by all policy makers of green economic development at all levels of territorial organization of countries.

Critics of the green growth approach point out that its proponents do not fully take into account the fundamental changes in economic systems that are needed to solve the climate crisis, the biodiversity crisis and a whole range of problems related to environmental degradation. Instead, critics point to alternative frameworks for desirable economic transformations that include ideas of stopping economic growth.

4. Post Growth approach

The post-growth concept focuses on the need to decoupling human well-being from economic growth, i.e. a departure from the established attitude in economics that a higher level of gross domestic product per inhabitant indisputably confirms a higher level of human well-being (Wiedmann et al, 2020). Supporters of the post-growth concept point out that it is possible for society to function better without atheoreticalrequirement for constant economic growth. They point out that it is possible to achieve more widespread economic justice, a higher level of social well-being and ecological regeneration in the future economic development of countries that does not imply the imperative of continuous intensification of economic growth.

Economies exist within the physical environment. Their existence depends on the continuous use of natural capital. Natural resources, whether they are non-renewable that are limited in total quantity, or they reproduce at a rate that is limited by the ability of the environment to renew them, are by their nature limiting factors of economic growth in the future. In the same way, the ability of the environment to absorb waste and various pollutions can be seen as inevitable companions of continuously growing production and consumption on a global level. Moreover, at the end of the last century there was already evidence that the intensity of the use of natural resources was more pronounced compared to the dynamics of their renewal, while the emission of waste increased at a pace that the environment could not keep up with.

Supporters of the post-growth concept believe that continued economic growth would make these problems almost unsolvable. However, they point out, it is possible to shape economies in such a way that production falls within the limits imposed by the available natural capital. A way of life on earth recognizes the pressures that a growing human population, with highly wrong patterns of production and consumption, put on a planet which already has limited physical resources.

Future economic and social development implies production and consumption within natural limits with the production of waste that can be absorbed by the environment. Many individuals waste far more than their fair share of resources by producing excessive waste. Individuals' lifestyles also confirm that advances in technology do not mean that it is possible for the economy to continue growing indefinitely. Technology cannot create something out of nothing. For example, technology cannot change the fact that there is a limited amount of oil; it can only squeeze a little more out of existing reserves. In a world with more people and higher rates of consumption, improvements in technological efficiency can, at best, buy more time before such gains are offset by further growth.

The literature on Post growth warns that technological innovations due to the "rebound effect", known as the Jevons paradox (Jevons, 1865), cannot be part of the solution, but that they are often part of the problem (Chakravarty, 2013). This claim is based on the observation that when a less resource-intensive technology is introduced, behavior around the use of that same technology can change so that it acts to increase consumption, which can cancel out resource-saving effects. In this context, supporters of the concept of post growth are of the opinion that effective solutions that respect the limiting character of natural capital in the development economy must include the complete rejection of the growth paradigm and the transition to a new paradigm of Post growth. However, as they note, existing societies, economies and cultures encourage the expansion of consumption, while the growth imperative in competitive market economies inhibits necessary social change.

The basis for the success of GDP as an indicator of well-being was established after the Second World War. During the post-war period of reconstruction, the focus was mainly on the production of goods and services. Newly founded institutions, including the United Nations, not only spread prosperity around the world, but also conceived a system of national accounts through which the economic progress of individual countries was monitored. At that time, the GDP indicator was an adequate indicator of well-being, despite the fact that at that time there was no unambiguous static basis for its calculation. Macroeconomists have shared the view that economic growth is an imperfect measure of well-being. Simply put, economic growth measures market transactions over a specific period of time in a specific country. All other factors, from inventory and distribution to negative environmental impact, are not measured. In addition, additional weaknesses of the GDP per capita indicator as a highly aggregated monetary indicator are due to differences in relative prices, differences in the purchasing power of different currencies, the selection of countries and the time interval for the purposes of comparative analysis.

Unlimited growth is impossible. In a system that has natural limits, nothing can grow forever. In 1972, the Club of Rome already made it clear that growth threatens the sustainability of the economy due to the fundamental problem of exponential growth in the use of energy, materials, goods and industrial production, as well as population growth (Meadows et al, 1972). Technological innovation can only help to a certain extent to make economic growth more sustainable. But, until today, that progress has not helped to slow the rate at which the global production system is

approaching ecosystem limits. On the contrary, sustainable innovations often do not have sustainable performance at the macro level (Hickel, 2020). This is especially true for the loss of biodiversity as one of the key consequences of unsustainable use of natural capital.

5. Degrowth concept

Degrowth is a construct that mobilizes numerous researchers and activists in criticizing the hegemony of economic growth, advocating a radical reorganization of society that leads to a drastic reduction in the use of natural and energy resources, which is considered a necessary, desirable and possible option. The fact is that the existing form of economic growth in industrialized countries is unsustainable. Even if that growth is "green" or "inclusive," or part of a transformative progressive agenda that invests massively in renewable energy resources and the transition to sustainability, industrialized countries cannot quickly reduce their negative environmental impact while at the same time their economies grow (Kalis, 2018). Therefore, the transformation of industrial production in economically developed countries is very necessary if they want to reduce the level of emissions and harmful effects on the environment (Schmelzer et al, 2022:11). The economic crisis that has its roots in the overconsumption of natural resources must therefore be addressed not only by improving economic efficiency but also by reducing the amount of things consumed by the richest 20 percent of people in the world (Klein, 2019).

Degrowth claims that such a transformation in the most economically developed countries is not only possible but also extremely desirable. This is because supporters of Degrowth believe that it is feasible to live well without growth and make society more just, democratic and truly prosperous. To achieve this, however, a fundamental political and economic reorganization of society is necessary, which aims to overcome the multiple structural dependencies on growth inherent in the capitalist economy, starting from industrialized infrastructures through social systems to the ideological myths of growth societies (Jackson, 2017).

Supporters of the Degrowth concept emphasize the need to reduce production and consumption, while defining the goals of economic development incomparably wider than neoclassical thought. In a certain sense, it is understandable considering the problems associated with the functioning of the modern economy (inequality in the distribution of newly created value, use of natural capital that exceeds the biophysical limits of the planet, overworked labor, rising costs of living (Demaria et al., 2013). Degrowth concept rejects the position of conventional growth theory that these problems are solved by recession and reduction of savings, which is why it is necessary to apply a new approach in finding sustainable production and demand.

There is more and more evidence that economic growth is not a sufficient condition for improving people's quality of life (Schmelzer et al, 2022). In short, Degrowth represents a targeted decrease in economic activity and consumption in high-income countries in order to make society more socially sustainable.

Degrowth does not have to be realized simultaneously in all areas of the economy. After all, there are certain economic areas, such as renewable energy and public transportation, that must grow for a healthy, sustainable future. But there are also parts of the economy that dominantly contribute to the growth of corporate profits and consumption of the richest social levels, which is of little significance for the improvement of human well-being viewed as a whole (Hickel, 2020).

The constant pursuit of economic growth is the main characteristic of modern societies. However, as supporters of the Degrowth concept point out, economic growth benefits a small number of people and requires large social and environmental sacrifices. The question is whether and how it is possible to stop the endless quest to increase global production and consumption and instead ensure socio-ecological conditions that support lives worth living for all. Living well with less is the key idea of the Degrowth concept. It is possible to realize this idea on condition that welfare, justice and sustainability are preferred. Slowing down growth can be achieved through transformative strategies that enable societies to slow down (Kalis et al, 2020).

Degrowth follows the path to a post-capitalist economy, which is rightful and more socially responsible. The advancement of human well-being and the halting of forthcoming ecological collapse is at its center. By taking less from the economy it is possible to achieve more. Degrowth advocates abandoning growth as the primary economic goal, reducing inequality in distribution, and reorganizing the economy to improve people's well-being rather than to accumulate capital.

6. Doughnut Economics

Rockström et al (2009) defined nine planetary boundaries, the crossing of which would disrupt global cycles. It is estimated that humanity has already crossed three out of nine limits, especially those related to climate change, the rate of biodiversity loss and changes in the nitrogen cycle. These planetary boundaries are interdependent because crossing one can change the position of other boundaries and lead to their transgression. The social impact of border crossing is reflected in the reduction of the social-ecological resilience of the affected societies (Richardson et al., 2023: 4).

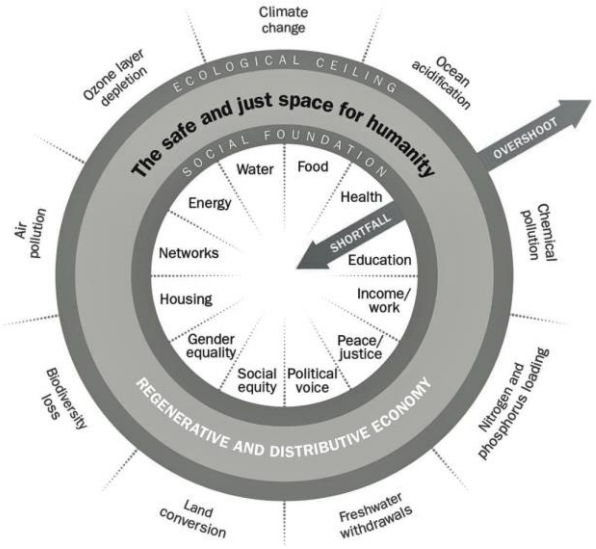
The concept of donut economics combines attention to the legitimate needs of the current human population with the need for transformation towards a sustainable future (Raworth, 2017). The purpose of economics is to promote and stimulate human prosperity and happiness. This implies a society in which everyone has material opportunities to fulfill their needs, but also a sustainable biosphere that enables drivers of economic growth to produce the necessary means for human prosperity without depleting vital natural resources.

The donut is an attempt to provide such a compass. It contrasts with the standard neoliberal agenda set by Samuelson's circular flow of production and income (Samuelson, 1948). He points out that the basic flow of economic resources is not a circular flow of money, but a one-way street of energy. The economy also depends on the proper functioning of society, households with all their unpaid elements.

Donut economics assumes the satisfaction of social needs within limits that respect ecological standards and represents a model that is socially sustainable. In order to remain in this space, it is necessary to transform linear economic activities so that they become regenerative and redistributive.

The model is made up of nine planetary boundaries that represent the ecological ceiling, and eleven indicators that represent the social base (Figure 2).

Figure 2: Model Doughnut Economics



Source: Revort, 2017: 38.

The donut model arose from the need to maintain humanity at the global, regional and local level within these boundaries, but also for the sake of measuring how much social needs such as housing, education, social justice, democracy and others are satisfied. In order to create a different society, approaches that will not reduce progress exclusively to GDP growthare needed.

Environmental boundaries that must not be exceeded are addressed through: air pollution, loss of biodiversity, land conversion, loss of fresh water, the nitrogen and phosphorus cycle, chemical pollution, ocean acidification, climate change and ozone depletion. Social needs that should be met are represented through the availability of water, food, energy, housing, internet, education and health care, while ensuring dignified work, social justice and social equality, peace, gender equality and freedom of choice.

After the initial presentation of the model, a large number of autonomous and decentralized groups and individuals began to work on its further development and modification. Indicators changed, their number decreased or increased, but the basic premise remained and it refers to necessity to stay in an ecologically safe space in which social needs will be met.

The inner ring of the Donut model determines the minimum required to lead a good life, derived from the UN Sustainable Development Goals - from food and clean water to a certain level of accommodation, sanitation, energy, education, health, gender equality, income.

The outer ring of the Donut model represents the planetary boundaries of the system, beyond which the human species should not cross in order not to damage the climate, ozone layer, soils, oceans, and biological diversity.

7. Conclusion

Alternative concepts of economic growth of the most recent date, such as the Green growth, Degrowth, Post growth and Doughnut models, are dominated by the view that natural capital represents the limiting determinant of economic growth. This confirms the defined research hypothesis in this paper.

The paper emphasizes the position that the concept of green growth, as one of the alternative concepts in the perception of future economic progress, is based on the idea that a growing economy is possible, with the condition of sustainable exploitation of natural resources and sustainable use of environmental services. Rejecting the complete reality of the views on the paradigm of sustainability as a philosophy of development, the creators of the concepts Degrowth, Post growth and Doughnut state that completely different approaches are necessary in looking at the possibility of economic growth in the future, bringing at the same time the very premise of growing production with the condition of sustainable use of natural capital. Moreover, they believe that, instead of being a solution to the biggest challenges of the present, uncontrolled economic growth is becoming a fundamental problem of modern humanity since it encourages the growing inequality in the distribution of created value and the increase of already existing imbalances in the environment. According to supporters of these concepts, natural capital represents par excellence the limiting determinant of economic growth, as a result of which we cannot speak of an unlimited increase in production. In other words, the perception of neoclassical economists about the substitutability of natural capital with other forms of capital is absolutely unrealistic, according to which a qualitatively new approach is needed in explaining the possibility of economic growth in the future. At the same time, in contrast to the supporters of the Green growth concept and its basis on the sustainable development paradigm, the protagonists of the Degrowth, Post growth and Doughnut concepts stand for different versions of "development without growth" as a vision of the future that offers a perspective to humanity, especially bearing in mind the inevitability of meeting needs within the limits imposed on total production by the limited amount of natural capital.

References

Ambec, S., Mark A. Cohen, M., Elgie, S., Lanoie, P. (2010). The Porter Hypothesis at 20: Can Environmental Regulation Enhance Innovation and Competitiveness? *Review of Environmental Economics and Policy*, 7(1): 2-22.

Barbier, E., (2012). *The Green Economy Post Rio+20. Science*, 338(6109): 887-888.

Baro, R. & Sala i Martin, X. (2004). Economic Growth, Cambrigde: MIT Press.

Chakravarty, D., Dasgupta, S., & Roy, J. (2013). Rebound effect: How much to worry? *Current Opinion in Environmental Sustainability*, *5*(2): 216–228

Cvetanović, S., & Andrejević Panić, A. (2021). *Promene fokusa u percepciji ekonomskog razvoja*.vSremska Kamenica: Univerzitet Edukons.

Demaria, F., Schneider, F., Sekulova, F., & Martinez-Alier, J. (2013). What is Degrowth? From an Activist Slogan to a Social Movement, *Environmental Values*, *22*(2): 191-215.

Dragutinović, D., Filipović, M., & Cvetanović, S. (2015). *Teorija privrednog rasta i razvoja.* Beograd: Ekonomski fakultet Univerziteta u Beogradu.

EEA (2014). *Resource-efficient green economy and EU policies*. European Environment Agency.

Ekins, P., Simon, S., Deutsch, L., Folke, C., de Groot, R. (2003). A framework for the practical application of the concepts of critical natural capital and strong sustainability, *Ecological Economics 44*(2-3):165-185.

Farley, J. (2008). The Role of Prices in Conserving Critical Natural Capital, *Conservation Biology*, 22(6) 1399-1408.

Harris, J, & Roach, B. (2021). *Environmental and Natural Resource Economics: A Contemporary Approach*. Routledge.

Hickel, J. (2020). The sustainable development index: Me suring the ecological efficiency of human development in the anthropocene. Ecological Economics, 167, 106331. Janicke

Jackson, T. (2017). *Prosperity without Growth Foundations for the Economy of Tomorrow*. Routledge.

Jevons, W. S. (1865). *The Coal Question. An inquiry concerning the progress of the nation and the probable exhaustion of our coal-mines*. Macmillan and Co.

Kallis, G. (2018). *Degrowth*. Agenda Publishing.

Kallis, G., Paulson, S., D'Alisa, G., & Demaria, F (2020). *The Case for Degrowth*. Wiley.

Klein, N. (2019). *On Fire: The (Burning) Case for a Green New Deal*. London: Penguin.

Loiseau, E., Saikku, L., Antikainen, R., Droste, N., Hansjürgens, B., Pitkänen, K., Leskinen, Kuikman, P., Leskinen, P. (2016). Green economy and related concepts: An overview. *Journal of Cleaner Production*, 139: 361-371.

Le Blanc, D. (2011). Special issue on green economy and sustainable development. Natural Resources Forum *35*(3):151 - 154

Meadows, D., Meadows, D., Randers, J., & Behrens, W. (1972). *The Limits to Growth*. New York: Universe Books.

Milanović, B. (2016). *Globalna nejednakost*, Novi Sad: Akademska knjiga.

OECD (2011). Towards Green Growth: Monitoring Progress.

Pearce, D., Markandya, A., Barbier, E. (1989). *Blueprint for a green economy*. London: Earthscan.

Pigou, A. (1920). *Economic Welfare*. London: MacMillan.

Piketi, T. (2015). *Kapital u XXI veku* (2015). Novi Sad: Akademska knjiga.

Porter, M., & van der Linde, C. (1995). Toward a New Conception of the Environment-Competitiveness Relationship. *Journal of Economic Perspectives*, 9 (4): 97-118.

Raworth, K. (2017). *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. Random House.

Richardson et al., (2023). Earth beyond six of nine planetary boundaries *Science Advances* 9, eadh2458.

Rockström J., Steffen W., Noone K., Persson Å., Stuart III C. F., Lambin E., & Foley J. (2009). Planetary Boundaries: Exploring the Safe Operating Space for Humanity, Ecology and Society, *14*(2).

Samuelson, P. (1948). *Economics, an Introductory Analysis.* McGraw-Hill.

Schmelzer, M., Vetter, A., &Vansintjan, A. (2022). *The Future Is Degrowth: A Guide to a World beyond Capitalism*. Verso Books.

Schumacher, E. (1973). *Small Is Beautiful: A Study of Economics As If People Mattered*. London: Blond & Briggs books.

Solow, R. (1956). A Contribution to the Theory of Economic Growth. *The Quarterly Journal of Economics*, *70*(1): 65-94

Solow, R. (1957). Technical change and the aggregate production function. *The review of Economics and Statistics*, *39*(3): 312-320.

Solow, R. (1974). The economics of resources or the resources of economics. *American Economic Review*, *64*(2): 1-14.

Stiglitz, J. (1974). Growth with exhaustible natural resources: efficient and optimal growth paths. The Review of Economic Studies 41 (Symposium on the Economics of Exhaustible Resources): 123–137.

Toman, M. (2012). Green Growth: an exploratory review. *Policy Research working paper*,no. WPS 6067 Washington: World Bank Group.

UNEP (2011). United Nations Environmental Programme. Decoupling natural resource use and environmental impacts from economic growth: A Report of the Working Group on Decoupling to the International Resource Panel.

van den Bergh, J. C. J. M. (2001). Ecological economics: themes, approaches and differences with environmental economics. *Regional Environmental Change*, *2*(1), 13-23.

Wiedmann, T., Lenzen, M., Keyßer, L.T. *et al.* (2020) Scientists' warning on affluence. *Natural Communication*, 11, 3107.

Williams C., & Millington A. (2004). The diverse and contested meanings of sustainable development. *The Geographical Journal*, *170*(2):99 – 104.

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PRIRODNI KAPITAL U ALTERNATIVNIM TEORIJAMA EKONOMSKOG RASTA

Apstrakt: Afirmacijom paradigme održivosti krajem prethodnog veka u ekonomskoj nauci se često raspravljalo o sadržajnoj obuhvatnosti i karakteristikama prirodnog kapitala kao determinante ekonomskog rasta. Najveći broj istraživača zastupao je tezu da ekonomski rast treba da bude održiv, odnosno da isti ne podrazumeva prekomernu upotrebu prirodnog kapitala (prirodnih resursa i apsorpcionog i regenerativnog kapaciteta ekoloških sistema) po jedinici novostvorene vrednosti. Tokom prethodnih godina u objašnjenjima prirodnog kapitala kao ograničavajuće determinante ekonomskog rasta pojavljuju se novi koncepti rasta poznati po nazivima Green growth, Degrowth, Post growth and Doughnut. U jezgru ovih koncepata nalazi se oštro suprostavljanje stavovima neoklasičnih ekonomista o mogućnosti neograničenog uvećanja ekonomskih altivnosti. Ovo, pored ostalog, i zbog činjenice što se prirodni kapital kao jedan od osnovnih pokretača ekonomskog rasta odlikuje limitiranošću i da isti nije moguće supstituisati drugim proizvodnim faktorima.

Keywords: Prirodni kapital, Zeleni rast, Derast, Post rast, Dougnut.