Urbanisation on Green Growth within Sustainable Development Goals

Subjects: Economics

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Keywords: sustainable development ; green economy ; renewable energy ; land

1. Introduction

Environmental challenges worldwide require appropriate measures and tools to tackle them without hindering economic growth. Against the backdrop of these challenges, the European Commission adopted the Green Deal policy [1], which set the blueprint for achieving carbon-free economic growth. Setting the background for this research, it is expedient to differentiate between economic growth and economic development. According to the studies [2][3][4][5][6][7], economic growth is an integrated output of using labour, capital, energy and land. Consequently, green economic growth aims at maximising the efficiency of input resources (labour, capital and land) while simultaneously decreasing the negative impact on the nature. In view of the EU Green Deal policy [1], the reduction in CO2 emissions is crucial for a transition to a carbon-free economy, as it encourages transformations in the governmental policies that require new knowledge, innovative technologies and resources [8][9][10][11][12][13][14][15][16][17][18][19][20][21]. In turn, green knowledge and innovation technologies promote modernisation of the industrial sector, reducing its destructive impact on the environment [22][23][24][25][26].

Urbanisation enhances dissemination of the green knowledge and innovative technologies, bridging gaps in living conditions and making services (health, digital, etc.) available and affordable. As stated in “Transforming our world: the 2030 Agenda for Sustainable Development” [8], goal 11 aims at providing the inclusive, safe, resilient and sustainable development of cities, with goal 11.3, in particular, focusing on strengthening sustainable urbanisation among all cities around the world [8]. While accelerated urbanisation causes an increase of environmental pollution, excessive consumption and depletion of resources, economic openness promotes the enlargement of green innovations and boosts dissemination of the state-of-the-art practices to overcome the issues caused by expanding urbanisation [9][10][11][12][13][14][15][16][17][18][19][20][21].

2. An Approach to Defining Green Economic Growth

An overview of the theoretical framework on estimating green economic growth allows differentiating between three core approaches: (1) an index-based procedure that measures green development based on the rank and values of the world indexes: the Sustainable Development Goal index, the Environmental Performance index, the Global Sustainable Competitiveness index, the Global Green Economy index, the Global Sustainability index, etc. [27][28][29][30][31][32]; (2) the green GDP procedure that estimates green economic growth based on the green GDP calculated as differences between GDP and economic losses from environmental issues [21][22][33][34][35][36][37][38][39]; (3) an input–output procedure that measures the maximum economic and ecological output while minimising the input of resources (labour, capital and natural resources) [34]. In addition, the analysis results outlined the following methods applied to gauge green economic growth: the global Malmquist–Luenberger productivity index, data envelopment analysis and the slack-based measure [22][23][24][25][26].

Adamowicz [27] outlined three definitions—green economy, green growth and low-carbon development—and proposed calculating green economic growth based on the methodology developed by the experts from the United Nations, UNEP, UNCTAD, OECD and the World Bank. The UNEP green economy was defined as the one that enhanced human well-being, minimised inequalities and ecological risks. In addition, Barbier [31] proposed gauging green development by the efficiency of natural resource use and environmental quality. According to the UNEP methodology, the green economy is

estimated by three groups of indicators: environmental (climate change, ecosystem management, the efficiency of resource use and waste management), policy (green investment, green taxes, green fiscal policy, carbon price, green education and green procurement) and well-being and inequality (employment, access to resources, health, human capital and natural capital) [27][30]. The OECD experts proposed using 26 indicators grouped according to four subindexes to estimate a country's green growth: environmental and resource productivity of the economy (carbon, energy, resource and multifactor productivity), a natural asset base (natural resources, renewable and non-renewable stocks, biodiversity and ecosystems), the environmental dimension of the quality of life (environmental health and risk, environmental services and amenities) and economic opportunities and policy responses (technology and innovation, environmental goods and services, international financial flows, prices and transfers, regulations and education) [32].

Furthermore, there is an emphasis on the significance of education on green issues [9][10][11][12][13] and technological innovations [40][41][42][43][44][45][46][47][48][49][50][51][52][53] so as to achieve green economic growth. Applying green GDP was researched as a measure of green economic growth [35][36][37][38][39][54][55][56][57][58]. In addition, it was proposed to add human capital and economic losses from environmental degradation to GDP [35][36][37]. Ecosystem services were proposed to be gauged while estimating green GDP [38]. At the same time, there was an emphasis on the necessity to consider the economy openness while measuring green GDP [58]. In addition, green growth depends on available financial resources [54][55][56][57][58][59].

A vast range of researchers [24][25][26][60][61] maintain that economic development should be coherent with ecological development. The concept of sustainable development implies that green economic growth can be achieved without compromising economic efficiency [17][18][19][20][21][49][50][51][52][53][60]. Zhong [60] argued that green economic growth promotes harmonising a country's economic, social and ecological development. Wang and Yi [61] estimated green economic growth to be based on the production theory for Chinese cities. In this case, the desired outputs were economic (GDP per capita) and ecological (urban green coverage rate). The undesirable outputs were measured by industrial wastewater, SO2 and soot emissions, and the compound environmental pollution index. In addition, the input variables comprised the number of employees, gross fixed capital stock, fixed inventory and energy consumption. The study [62] applied production theory to estimating the green economic growth of Belt and Road Initiative countries. Labour, capital and energy were the input data, while air pollution (measured by CO2 emissions) was the undesired output and GDP was the desired output. According to the findings, Qatar, Saudi Arabia, Singapore and the UAE are the leaders in green economic growth among the 28 Belt and Road Initiative countries.

3. An Approach to Defining the Impact of Urbanisation on the Green Economic Growth

An overview of the relevant research showed that urbanisation could promote economic growth due to an increase in the quality of life, dissemination of knowledge and innovations, and levelling inequalities in the access to resources and capital [63][64]. At the same time, economic growth requires more resources (capital, human and natural), which exerts an increasingly destructive impact on the environment. It was confirmed that urbanisation stimulates economic growth in developing and developed countries [65][66][67][68][69][70].

While analysing the impact of urbanisation on the regional growth in China [65][66], a phenomenon of "urbanisation without growth" caused by excessive migration from rural to urban regions in developing countries was defined. It was proven that urbanisation is conducive to economic growth in developed countries, but it restricts the economic growth of developing countries [71][72].

Furthermore, there was studied a nonlinear relationship between economic growth and urbanisation caused by over-urbanisation [65]. Developed countries have a higher proportion of the labour force employed in non-agricultural sectors than developing countries, compared to urban populations [65]. In addition, the impact of urbanisation is determined by the regions and countries' economic conditions, with urbanisation causing gaps and inequalities between cities and mega-cities [66][67][68][69][70][71][72][73]. The study [74] confirmed that urbanisation leads to changes in food demand and land use. Researchers also concluded that urbanisation could have a positive effect on the economic growth if the government pursued effective policies and that an effective policy of spreading technological innovation allows overcoming the issues of over-urbanisation and helps reduce environmental pollution [75][76][77][78][79]. Chen [80] emphasised that urbanisation positively affects GDP per capita and carbon tax; yet it causes CO2 emissions. Based on the empirical results of the Granger causality test, Khoshnevis and Golestani [81] justified the bidirectional causality among economic growth, CO2 emissions and urbanisation. In view of the fact that urbanisation was proven to play a core role in managing climate change [82], it was emphasised that SDGs could be achieved only in the case of eliminating environmental threats [82][83].

Researchers [62] confirmed that urbanisation spurs environmental pollution and intensification of using resources. Even more, a U-shaped relationship between pollution and green economic growth was determined [83][84][85][86][87]. Urbanisation was applied as a control variable in estimating green economic growth [62], with urbanisation being measured by the share of population living in urban areas [62][87][88]. These findings prompted the conclusion that urbanisation negatively impacts the green growth of Belt and Road Initiative countries. It was proven that rapid urbanisation increases water pollution in the cities along the Yangtze River Economic Belt [88]. Yet, another study [89] confirmed the positive effect of urbanisation on the green economic growth of the Chinese cities. Li, Dong and Dong [90] applied urbanisation rate as the control variable to estimate the interconnections between green growth, green trade and green energy. Their findings [90] demonstrated that urbanisation negatively influenced green growth in China, to say nothing about promoting it. Similar conclusions were made in the research conducted by Izakovicova, Petrovic and Pauditsova [91], who argued that without relevant effective governance and planning, urbanisation results in the environmental degradation.

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