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OIL EXTRACTION AND RESOURCE SCARCITY: AN IN-DEPTH ANALYSIS OF US TRENDS

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Abstract

Natural resource scarcity is a multifaceted concern that has evolved over time, encompassing shifts in the cost, quality, and availability of energy and materials, as well as the growing shortage of ecosystem services crucial for human economic survival. This paper investigates the intricacies of natural resource scarcity by focusing on oil resource extraction in the United States, examining both economic and biophysical indicators.

The economic indicators under scrutiny comprise the market prices of crude oil and natural gas, the unit cost of extraction, and the average total extraction cost. Additionally, the study explores the energy return on investment (EROI) as a pivotal biophysical indicator. The extraction of oil resources has undergone a noteworthy transformation, transitioning from a period of decreasing scarcity to one of increasing scarcity, notably around the 1960s. This transition raises a pertinent question: can economic growth be sustained within the constraints of a finite natural world?

This study delves into these economic and biophysical indicators, aiming to provide a comprehensive view of natural resource scarcity and its implications. It considers the evolving nature of scarcity and the strategies adopted to address these scarcities, and how they have shaped economic growth. With an increasing global population and greater resource utilization, it is essential to comprehend how humans have responded to signals of heightened resource scarcity.

INTRODUCTION

Natural resource scarcity has long been a concern due to changes in the cost, quality, and availability of energy and material inputs in the production process (Linnhoff et al., 2019). However, in recent times, environmental

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investors are increasingly concerned about a new dimension of scarcity: the growing shortage of ecosystem services that support human economic existence. This scarcity is particularly concerning since environmental resources are not typically traded in markets, which makes it difficult to detect shortage signals and implement appropriate policy responses (Linnhoff et al., 2019).

In this context, this paper aims to investigate economic and biophysical indicators of natural resource scarcity by examining the extraction of oil resources in the U.S. The economic indicators that will be analyzed in this study include the market price of crude oil and natural gas, the unit cost of extraction, and the average total cost of extraction. On the other hand, the biophysical indicator that will be examined is the energy return on investment (EROI) (Alfons et al., 2013).

Previous research has shown that all these indicators exhibit a pattern of declining and then increasing scarcity of oil at the wellhead, with the 1960s marking the transition from a decreasing to an increasing cost resource base (Alfons et al., 2013). The debate about whether economic growth can be sustained in a limited natural world has been a persistent question in economic literature for a long time. Despite the unprecedented growth in human population and resource utilization, humans have been quite effective at finding solutions to the problem of scarce natural resources, particularly in response to signals of increased scarcity (Linnhoff et al., 2019).

However, the problem is that, unlike other resources, natural resources do not have a substitute, and once they are depleted, they cannot be replaced. Thus, the economic growth model that depends on the constant availability of natural resources is unsustainable (Dalevska et al., 2019). The sustainability of natural resource use is particularly relevant since, over the last two centuries, human population and economic prosperity have experienced an unprecedented growth rate. This growth has been fueled by equally unprecedented natural resource utilization and environmental impact, including the conversion of significant portions of the natural world to human use (Feldmeyer et al., 2020).

This unsustainable trend has led to increasing concerns about the world's natural resource base's ability to support such growth. This concern is backed up by simple math, as continued physical growth in a limited world eventually produces irrational outcomes (Feldmeyer et al., 2020). For example, any positive population growth rate ultimately leads to a population that covers the face of the Earth and rapidly expands into space. Similarly, any positive growth rate for oil consumption eventually results in annual production that is greater than the mass of the Earth (Dalevska et al., 2019).

While natural resource scarcity is expected to increase with outstanding growth, human creativity can mitigate increased scarcity. People have been adept at finding solutions to the problem of scarce natural resources, such as finding more abundant substitutes for different natural resources, exploring and discovering new reserves, and recovering and recycling materials (Feldmeyer et al., 2020). One key factor in ecosystems and the provision of resource services is the inseparable connections between the elements of an ecosystem. However, business rationality for natural resource products generally considers only a few of the elements in the ecosystem. The extraction of one element or the addition of excessive amounts of another can disrupt the entire balance of the ecosystem, with unforeseen consequences (Nyangarika & Tang, 2018).

Therefore, the goal of this study is to analyze the economic and biophysical indicators of natural resource scarcity by examining the extraction of oil resources in the U.S. The findings of this research

CONCLUSION

Advancements in PC innovation and directional boring, neither of which was anticipated in Scarcity and Growth Reconsidered, have considerably brought down investigation and improvement costs and upgraded recuperation from existing stores. Disclosure and advancement costs in the United States are 33% of what they were quite a

while back. World demonstrated petrol holds expanded from 660 billion barrels toward the finish of 1980 to 1,009 billion barrels toward the finish of 1990. Despite the fact that utilization from 1991 to 2000 was roughly 250 billion barrels, demonstrated saves toward the finish of 2000 remained at 1,046 billion barrels. The United States created 28 billion barrels of oil during the 1990s, yet its demonstrated stores dropped by just 4.1 billion barrels.

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