Journal of Social and Political Sciences

Anh, T. D. (2023). The Theoretical Framework on the Impact of Monetary Policy on Environmental Pollution. ***Journal of Social and Political Sciences*****, 6(3), 209-216.**

ISSN 2615-3718

DOI: 10.31014/aior.1991.06.03.438

The online version of this article can be found at:
https://www.asianinstituteofresearch.org/

Published by:
The Asian Institute of Research

The Asian Institute of Research
Journal of Social and Political Sciences
Vol.6, No.3, 2023: 209-216
ISSN 2615-3718

DOI: 10.31014/aior.1991.06.03.438

The Theoretical Framework on the Impact of Monetary Policy on Environmental Pollution

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Abstract
The research aims at investigating the theoretical background concerning the influence of monetary policy on the environment, with specific emphasis on the Keynesian theory and the Environmental Kuznets Curve. The initial focus is on Keynes's theory, which addresses government intervention as well as extending its scope to encompass sustainable economic development and environmental protection. Subsequently, the Environmental Kuznets Curve with the purpose of analyzing the correlation between economic development and environmental quality. In addition, relevant theories such as the "Sustainable Livelihoods Framework" and "Corporate Social Responsibility" (CSR) were reviewed as in pursuit of long-term and sustainable goals.

Keywords: Monetary Policy, Environmental Pollution, Keynesian Theory, Environmental Kuznets Curve, Sustainable Livelihoods Framework, Corporate Social Responsibility

1. Keynesian system theory

John Maynard Keynes (1883-1946) is an English economist and one of the most influential people in the world. He was the one who challenged classical thinking after the Great Depression. Previously, economists said that whenever there was an economic crisis, prices and wages fell; Manufacturers will have an incentive to hire more workers and expand production, so the economy will recover. However, Keynes observed the crisis and found that wages did not fall, employment did not increase, and production did not recover. Since then, Keynes argued that the perfect market, as classical economists often assumed, is no longer relevant. He advocates for government intervention in the economy, because the government will use fiscal policy and monetary policy to regulate the economy more effectively. Keynes' most famous work, and also shaped Keynes' economic thought, is *The General Theory of Employment, Interest and Money* (Keynes, 2016). This work gave the most general and specific overview of Keynes' theoretical system of economics.

According to Phan Huy Duong and Bui Duc Tung (2011), Keynes' main economic views can be generalized as follows:

- Wages are rigid. The salary agreed between the employer and the employee is nominal, not actual, and is enshrined in the employment contract, protected by unions and the law.
- Expectations of falling wages and prices will cause people to cut off spending, thinking that the money in their pockets is increasing in value.
- Falling interest rates do not necessarily lead to increased investment. Interest rates decrease, but saving is unlikely to have followed because the income effect and the substitution effect of lower interest rates cancel each other. And when saving doesn't decrease, investment doesn't increase.
- Regulations on interest rates, especially in the short term, are all about money supply or money demand.
- Interest rates shouldn't drop below a certain level, because at that level investors will want to keep cash, reducing investment.
- Equilibrium can be reached even with unemployment.
- Tightening spending in times of crisis only exacerbates the crisis. When the economy is in recession, the government should raise spending to increase aggregate demand as an anti-recession policy.

The most important theories in the Keynesian system of theory include:

The General Theory of Employment, which was first mentioned in his work The General Theory of Employment, Interest and Money. The basic content includes: the economy is affected by two basic factors: aggregate supply and aggregate demand. The level of aggregate output and employment in the economy is determined by aggregate demand, and the level of aggregate supply is a consequence of aggregate demand. Employment is not only an expression of the labor market, but also related to production, output, and income scale, reflecting the current state of the economy. The rise in employment will lead to increased income, consumption, shopping demand and affect production scale, therefore increase total supply.

The theory of limited propensity to consume suggests that personal income will be used for consumption and savings. The propensity to save is directly proportional to the increase in income, and the propensity to consume is inversely proportional to the increase in income. The more income increases, the lower the marginal propensity to consume will decrease and cause a shortage of demand. There are 3 factors affecting the tendency of individual consumption including income, objective factors affecting income such as changes in nominal wages, interest rate or tax policy and subjective factors such as setting hedge against risks, enjoying old age or preparing future projects.

The theory of Investment multiplier. Accordingly, in order to increase national income (gross national output), investment must be increased. Here, Keynes studied the relationship between increased investment and increased national output and introduced the concept of "investment multiplier." The investment multiplier (K) shows the relationship between an increase in investment and an increase in income. The investment multiplier is the relationship between an increase in income and an increase in investment. It determines how many times a rise of investment will result in a rise of income. The investment multiplier process is represented by a knock-on effect: increasing investment leads to an increase in income; ... In doing so, the investment multiplier will amplify income.

The limited efficiency theory of capital assumes that the limited efficiency of capital depends on the future rate of return on the amount of new investment, not on its original cost. According to this theory, there are two reasons why the limited efficiency of capital decreases:

- Increased investment causes the supply of goods to increase, commodity prices will fall and future income will be reduced.
- An increase in the supply of goods will require an increased cost of fixed assets and a decrease in future income.

Keynesian theory of interest rate: interest is the compensation for not using cash for a certain period of time. Money holders only lend when they earn a high interest rate, while in the economy, the interest rate is inversely proportional to the amount of money in circulation. Therefore, in order to regulate interest rates, money circulation must be regulated. Factors that affect interest rates include the amount of money in circulation and the preference for cash, depending on the dynamics of transactions, incentives to hedge or speculate.

Theory of governance role in economic regulation. This is the opposite view of the classical economists in earlier periods, when they argued that the state should not intervene directly in the market but should only create the business environment. According to John Maynard Keynes (2016), between supply and demand there is rarely a balance, because they are affected by a series of factors (income, limited propensity to consume, saving, limited efficiency of capital, interest rates, cash preference...) and in most cases aggregate demand is always smaller than aggregate supply. This situation causes an excess of goods, shrinking production, and increasing unemployment. According to Keynes, the market mechanism cannot regulate the contradictions in the process of reproduction, ensure economic balance and prevent economic crisis and unemployment, and must have the state's help. In the role and function of economic management by using the state budget to encourage/overwhelm private investment. Measures that the state can use to regulate the market crisis can include:

- Measures to increase total investment demand: Promote state investment, increase investment through orders; financial support; develop investment programs… and encourage private investment.
- Using the financial system, credit and monetary circulation: These are important tools in macroeconomic policy including: Tax́; interest rates… (Fiscal policy and monetary policy). Implement moderated inflation to stimulate the market without causing danger. Using tax instruments to regulate the economy.
- Job development in all forms. According to him, investment in any field is good, as long as it can create jobs, make more income, fight crises and unemployment.
- Stimulate private consumption: Encourage lavish spending with capitalists, the upper class, and also with the lower class.

Over time, Keynes' theory was increasingly developed and extended to many aspects of the economy. Including sustainable economic development, assessing the correlation between economic development and environmental protection issues. The first can include an explanation with the investment multiplier theory. As investment increases, income will also increase by a certain factor. It is also true when investing in environmental protection and sustainable development. Based on the original Keynesian theory, when investment in environmental protection activities increases, people's health is more secure and they create more wealth and income; or in the other direction, investing in renewable energy sources, energy saving methods in production helps to reduce costs, thereby increasing income at the same time.

Following, the government's regulation in sustainable economic development is extremely necessary. These investments in the environment do not bring immediate economic benefits to investors. Therefore, they tend to invest less in environmental protection and give priority to other manufacturing industries. Since then, if the Government does not regulate, the environment will be increasingly degraded, natural resources will be increasingly depleted, causing the supply for production to be affected. The government will be the one that has the ability to intervene and make decisions on public investment directly in these activities, not only paying attention to economic benefits. Environmental Keynesianism believed that investing in green infrastructure will expand the economy in new directions of sustainable development such as renewable energy, fuel efficiency or environmental improvement.

The third opinion is that with the development of advanced science, green technologies with the environment are being prioritized, such as low carbon technology. This appeal to the national interest by investing heavily in research and development in the industries of the future will help a government build an economy that is internationally competitive.

Theories continue to be developed and proposed around the issue of the relationship between the environment and the development of the economy. There are many theories that inherit the comments and views of the Keynesian theory system. Typical of which can be mentioned is the theory of the environmental economic curve Kuznets, which revolves around the problem of explaining the relationship between economic development -

through per capita income and impact on the environment - through statistics of damage caused to the environment.

2. The theory of the Kuznets curve and the relationship between economic growth and environmental quality

The father of modern economics, Adam Smith (1776) identified the core problem when studying the nature of economics, which is the scarcity of resources. For each individual, scarcity is expressed through a matter of money or time. For businesses, it is a scarcity of capital, human resources or production capacity. For a country, scarcity is reflected in the exploitation and use of natural resources; in maintaining a suitable living environment for the production of goods, for meeting subsistence needs, and for economic development. If this scarcity is not well resolved, when people are too focused on economic development, they will over-exploit natural resources, and at the same time release wastes into the environment; directly reduce the renewable capacity of resources and the carrying capacity of the environment.

Economic development that does not go along with environmental protection will directly affect and reduce the quality of life. Therefore, between economic development and environmental protection must be carried out in parallel to ensure sustainability or in other words, there must be environmental control measures whilst economic development, technology deployment and development. Thanks to socio-economic development, human knowledge is enhanced, along with technological development and management ability. This is the basis for people to control activities that adversely affect the environment as well as orient for a greener development process. At that time, the environment will be the foundation and basis for development, on the contrary, economic development creates conditions for environmental improvement and protection, environmental quality improvement, and life improvement.

Based on the relationship between environment and economic development, policy makers have formulated the concept of a sustainable economy. An economy that is considered sustainable development will have to meet the following two basic principles: *Principle 1:* The level of exploitation and use of renewable resources must always be less than the renewable level of that resource. Principle 1 emphasizes the requirement to maintain a stable reserve of natural resources over time, not to conduct over-exploitation or over-exploitation of nature. *Principle 2:* Always maintain the amount of waste entering the environment less than the capacity of the environment to absorb or assimilate in that area. Principle 2 ensures to maintain the environmental tolerance to human economic activities, minimizing the risk of environmental pollution. The above two principles have summarized the two most basic requirements in facing the problem of scarcity of natural resources in economic activities. At first glance, these two principles seem short and simple. However to be able to apply these two principles at the same time, it takes a lot of research, evaluation and experimentation.

Hoang Trong Co (2005) asserts that humans can completely control the recovery of renewable resources and the absorptive capacity of the environment by adjusting their own behavior. Enhancing each individual's responsibility for nature, awareness of environmental management can improve the role of providing resources and the self-healing capacity of the environment.

From the perspective of economic management, the authorities need to accurately grasp the impacts of each economic activity on the environment. That can be the direct impact from mining activities, fishing and farming; goods production activities; or indirect impacts from project investment activities on the environment, green financial activities and international trade, import and export. Each impact needs to be analyzed and evaluated in detail, from causes, methods and results. From there, planners can make the most optimal policies to promote a sustainable development economy, a green economy that contributes to improving and reducing environmental pollution.

At the 67th annual meeting of the American Economic Association in December 1954, Simon Kuznets first introduced the concept of the Kuznets curve, describing the relationship between economic development and the environment (Simone Borghesi, 1999). By 1991, the Kuznets curve had become a means of describing the relationship between environmental quality and income per capita over time. Economists have used data on the environment as well as per capita national income to study this relationship.

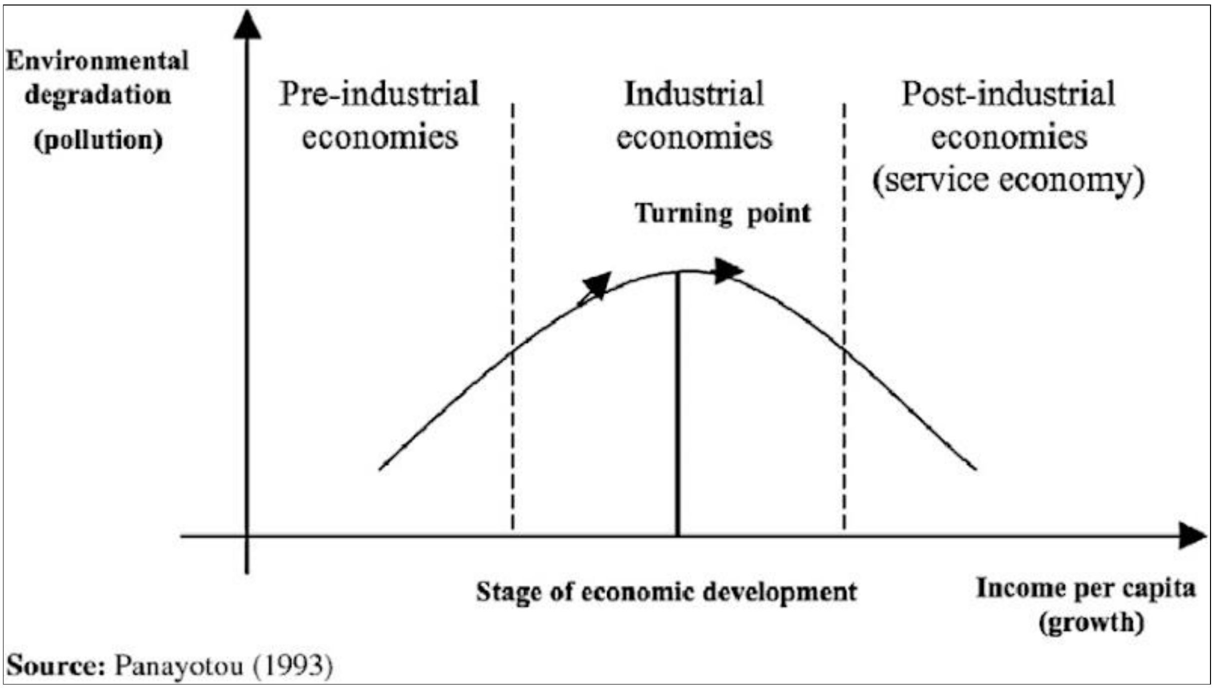

Figure 1: Kuznets Environmental Economic Curve (Bui Trinh and Bui Quoc, 2020)

The Environmental Kuznets Curve (EKC) is a theory developed from the original Kuznets curve theory - which talks about the relationship between per capita income and the equality of a country's income distribution. The Environmental Kuznets Curve is concerned with another aspect of economic growth, which is environmental degradation. It is based on the hypothesis of an inverted-U relationship between economic output per capita and a measure of environmental quality (Figure). This shape of the Kuznets environmental economy curve can be explained: as per capita income increases, the environment is degraded; however, when a certain turning point is reached, the increase in per capita growth will limit environmental degradation.

From the shape of the environmental Kuznets curve, several observations can be made. Firstly, at low-income levels, pollution mitigation is difficult to achieve because individuals tend to use only limited income to meet basic consumption needs. When income levels reach a certain level, individuals begin to consider the choice between environmental quality and consumption, resulting in environmental damage still increasing but at a lower rate. After passing the turning point, the average income has reached a remarkably high level, now every individual wants to improve their quality of life by consuming more and increasing spending on environmental improvement. Since then, environmental quality began to change in the same direction as the growth of the economy. There are also a number of specific theories around the world to explain the shape of the environmental Kuznets curve.

Panayotou T. (1993) based on stages of economic development to explain the inverted U-shape. The structural change of a country from rural to urban and from agriculture to manufacturing in the first stage of development can lead to environmental degradation. This development leads to a high amount of greenhouse gas emissions. However, in the next period, the economic structure shifts from manufacturing to services and pollution can be reduced due to the growth of low-carbon industries.

Galeotti and Lanza (2005) explained that technological progress can be a reason to reduce emissions as a country reaches the high-income stage. This means that as countries get richer, they have more resources to improve their technology. As a result, polluting technologies are replaced by environmentally friendly ones.

Changing behavior is also an explanation of the environmental Kuznets curve. When society initially prefers a high level of consumption without noticing the manner in which it is consumed. Then, when the level of consumption is high enough, they will change their behavior because they want to experience a better living condition, in a cleaner environment.

3. Other related theories

3.1. Sustainable Livelihoods Framework Theory

Livelihood is defined by the UK department for International Development (2001) as follows: livelihood includes capabilities, assets (including physical and social resources) and activities required to earn a living.

Sustainable livelihood according to Hanstad et al. (2004) is defined: a livelihood is considered sustainable when it has the ability to cope with and recover from impact, or can promote capabilities and resources assets both now and in the future while not eroding the foundation of natural resources. According to Chambers and Conway (1992), a livelihood is considered sustainable when it is able to cope with and overcome pressure as well as create unexpected changes in the process of movement and development of human life. At the same time, sustainable livelihoods also limit negative impacts which are detrimental to the environment or other livelihoods in the present and in the future to bring greater goods to future generations.

The Framework for Sustainable Livelihoods Analysis, developed by the UK Department for International Development, is considered by some researchers to be “a comprehensive approach to development issues by emphasizing discussion of the livelihoods of people and poverty in different contexts” (Nguyen Van Suu, 2010). This theory of sustainable livelihoods framework is applied, analyzed and studied in many countries.

The Sustainable Livelihoods Framework includes the key factors affecting people's livelihoods and the underlying relationships between them. It can be used to plan new developments and assess the contribution to livelihood sustainability of existing activities. Details include: Providing a list of the most important issues and outlining the relationships between these components; paying attention to important impacts and processes; Emphasizing the complex interplay between different factors affecting livelihoods.

This analytical framework addresses the factors and components that create livelihoods, including: (1) Perceivable priorities; (2) The strategies they choose to pursue those priorities; (3) Institutions, policies and organizations that determine their access to assets or opportunities and the outcomes they obtain; (4) Their approach to the five types of capital and their ability to use them effectively; (5) People's living context, including economic trends, technology, population, shocks and seasons (Nguyen Van Suu, 2010).

5 resources for sustainable livelihood development include: N (Natural capital) - Natural resources are all natural materials to create livelihoods; H (Human capital) - Human resources represent skills, knowledge, employability and good health, all forming the conditions that enable people to pursue different livelihood strategies and achieve livelihood goals; P (Physical capital) - Physical resources are infrastructure and machinery and equipment that are put into production for livelihoods; F (Financial capital) - Financial resources are the ones used to achieve livelihood goals and; S (Social capital) - Social resources are relationships, networks, group membership, beliefs, interdependence and information exchange within groups, a collection of individuals in society that are utilized to pursue livelihood goals.

The purpose of studying the sustainable livelihoods framework is to understand the ways in which people use the resources around them to make a living as well as to achieve their livelihood goals in the long term. Sustainability here can also be understood as improving the living environment, protecting the environment and nature. Studying livelihood outcomes will provide important information about what drives people's activities and what they are prioritizing. In order to make this goal a sustainable goal, protect the environment and respond to climate change; Sustainable livelihoods framework will show what motivates people to work towards and strive to achieve this goal. Livelihood outcomes are reflected in indicators such as better living, improved living standards, reduced vulnerability, improved food security and sustainable use of natural resources.

3.2. Social responsibility theory

One of the reasons why organizations sponsor green projects comes from the issue of corporate social responsibility. This problem comes from the idea: is profit the only measure for the performance of businesses in general and banks? And are banks responsible for environmental protection?

Corporate Social Responsibility (CSR) is defined differently depending on the research context. Carroll and Laasch (2020) argue that social responsibility covers a wider range of economic, legal, ethical and other issues that society expects in a certain time. CSR covers four main areas: economic growth responsibility, legal compliance, ethical issues and finally volunteer responsibility. This point of view is similar to that of Marten and Moon (2020) who argued that CSR includes the concepts of business ethics, corporate philanthropy, sustainability and environmental responsibility and responsibility to employees.

Over the past twenty years, an increasing number of companies worldwide have realized the economic benefits of CSR policies and measures (Agudelo et al., 2019). CSR has become a fundamental element in the response of companies to various social requirements, understood as the way in which companies fulfill their social commitments and responsibilities, taking into account the impact of their activities with stakeholders, therefore, it creates the trust that allows them to operate in different markets (Panait et al., 2021). Initially, these were voluntary requests, but have been widely accepted by companies. In addition, at the institutional level, it is advisable to propose codes of good practice on corporate governance in different countries. It can be said that this process culminated in the 2000s in the shift of CSR towards integration in business strategies (Rodriguez-Gomez et al., 2020). CSR became a part of the core business and began to be studied not only in relation to achieving competitive advantage or efficiency in the use of resources, but also as a reference point for promoting policies within the company, with innovation being a central aspect in every sector, but primarily in the environment.

In this context, CSR represents the way in which companies contribute to meet the needs and requirements of their stakeholders and, in particular, their role in ensuring long-term sustainability. CSR commitments go beyond the desire to increase profits, and show that enterprises are fully aware of their responsibilities to employees, customers, communities and the environment. Many companies have used CSR as a new business direction when realizing that it can help enhance the role of managers, improve financial situation, improve employee motivation, promote customer loyalty and company reputation to society. Publicizing the good implementation of social responsibility is considered by enterprises as a way to support enterprises to improve their financial performance. Investment in supporting economic development and local life can also help enterprises increase their brand value and reputation significantly, thereby helping them attract partners, investors and attract a better source of labor, a cheaper and more reliable source of supply. Thus, it can be said that CSR has an impact on investment decisions of enterprises. More compactly, CSR will affect the decision to sponsor green credit of credit institutions.

Until now, the systematic assessment of CSR in countries with economies in transition has been limited. Ali et al (2017) concluded that CSR reporting received different interest from stakeholders in developed and developing countries. Interested stakeholders in developed countries are often shareholders, regulators, creditors, investors, environmentalists and the media, while in developing countries they are international buyers, foreign investors, international media and international regulatory agencies such as the World Bank. Furthermore, in contrast to developed countries, companies in developing countries are under relatively lower pressure to publish CSR reports. In countries with transition economies, the confusion between CSR with codes of conduct, labor rules, and lack of transparency in information disclosure has made it difficult to assess the impact of CSR on enterprises' financial performance.

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