



# CONSTRUCTAL LAW AND FREE ECONOMIC MARKET

AMIR NEKOUNAM<sup>a</sup>, MOHAMMAD OLFATI<sup>b\*</sup>

<sup>a</sup> Allameh Tabataba'i University, Tehran, Iran,

<sup>b</sup> Engineering faculty, Razi university, Kermanshah, Iran, m\_olfati@yahoo.com

\*Correspondence: m\_olfati@yahoo.com;+989398394261.

Constructal law is a rapidly expanding field in physics, biology, technology, economics, and social sciences. It states that everything that flows and moves does so with an evolutionary design. Flow configurations, patterns, and rhythms change over time to provide greater access to their streams, allowing for easier flow. The rule of law and government describe movement "with design" on Earth. In a free market system, each person freely follows their interests, ultimately maximizing the interests of society as a whole. This means that free people can choose and trade, leading to increased growth in the country. In other words, in a free market system, individual freedom is a crucial principle for the country's progress; as the Constructal law states, "for a flow system to survive over time, it must evolve freely." In this paper, we will illustrate that when economic freedom increases, the per capita production of countries rises. In other words, economic freedom leads to welfare in society.

**Keywords:** Constructal law; Economics; Evolutionary design; Free market; Welfare.

## 1. INTRODUCTION

Constructal law was first formulated at Duke University by Bejan in 1996. Since then, it has spread worldwide. Thousands of researchers have written about the constructal law, and many more have heard about it. The Constructal law is a law of physics that explains the natural tendency of all flow systems to evolve into configurations that offer progressively greater flow access over time [1]. The statement is that "for a flow system to persist in time, it must evolve in such a way that it provides easier access to its currents" [2]. The constructal law, also known as the law of configuration generation or the law of design, is a rapidly expanding field in physics, biology, technology, and social sciences [3].

The Constructal law is not about optimization, maximization, minimization, or any specific end design. Instead, it describes the direction of evolution over time, emphasizing that the design phenomenon is dynamic and constantly changing. It's important to note this as many ad hoc proposals of optimality are emerging in this regard [4].

## 2. CONSTRUCTAL LAW OF DESIGN AND EVOLUTION IN NATURE

Constructal law applies to a universal concept: Whenever something flows or moves, it does so with an evolutionary design. This involves changing flow patterns and rhythms that naturally adapt over time to allow for easier movement. The rule of law and government essentially describe organized movements on earth. For example, traffic signs in the city demonstrate this principle [1]. Another example is the free market. They all "happen," and their evolution toward easier flow over time happens.

Flow generates better flow. A society that flows more is wealthier. It has a greater tendency to reconfigure itself to flow even more and to become even richer over time. There is no end to this evolving design. There is just the time direction of the evolutionary changes and the rate at which changes are occurring. Good is a government that facilitates the movement, reach, and staying power of the whole society, which includes mobility, participation, access, health, and life expectancy. A government becomes better when it opens the channels, *i.e.*, access. This means that we need a government that creates free flow. A more open government is good for better-flowing business streams and vice versa. Their evolution is the large-scale manifestation of every individual's urge to be free, make choices, vote, and make changes to live better [1]. Therefore, according to the constructal law, capitalism causes progress and development. The constructal law emphasizes decentralized decision-making. Systems evolve spontaneously, adapting to optimize flow and access.

### 3. CAPITALISM AND INDIVIDUAL FREEDOM

In a capitalist economy or a free market system, each person freely follows his interests, ultimately maximizing the interests of the whole society. Adam Smith first stated this idea [5] and interpreted it as the market's invisible hand. Hayek [6] believed there is a spontaneous order in the free market system, which is not based on a human plan but on human action. It means that free people can choose and trade, which increases the country's growth. In centralized planning, people's freedom is ignored, and since the government does not know everything, the centralized planning system will fail.

On the other hand, Mises [7] considered time a key issue in his analysis and believed that people's preferences may change at different times, so centralized planning is ineffective. In other words, in the free market system, individual freedom is a key principle for the country's progress; as the constructal law states, “for a flow system to survive over time, it must evolve freely.”

The idea of spontaneous order is Hayek's best-known contribution to contemporary social science. However, as several chapters demonstrate, it is also very relevant to the natural sciences. In Hayek's view, spontaneous order—the emergence of complex order as the unintended consequence of individual actions that have no such end in view—is both the origin of the Great Society and its underlying principle. Hayek means, by the Great Society, a social and political order that has emerged spontaneously through the interaction of individuals going about their everyday business and sustains itself through the exact mechanism. In this sense, the idea of the Great Society and spontaneous order stand or fall together [8].

The economic freedom of countries can be calculated. Some sources have rated the economic freedom of countries with assumptions. Also, the per capita production obtained by dividing the gross domestic product by the population can be achieved. Figure 1 illustrates economic freedom on the X-axis and per capita production on the Y-axis, where almost a direct relationship between these two variables is visible. In other words, as economic freedom increases, the per capita production of countries rises.

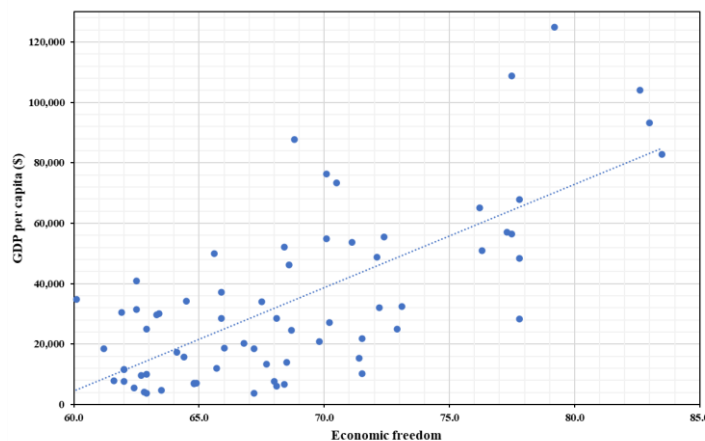


Fig. 1 – GDP per capita *versus* Economic freedom.

### REFERENCES

1. Bejan A., Lorente S., Constructal law of design and evolution: Physics, biology, technology, and society, *Journal of Applied Physics*, **113**, 15 (2013).
2. Bejan A., The constructal law of organization in nature: tree-shaped flows and body size, *Journal of Experimental Biology*, **208**, 9, pp. 1677–1686 (2005).
3. Bejan A., Lorente S., Constructal theory of generation of configuration in nature and engineering, *Journal of Applied Physics*, **100**, 4 (2006).
4. Bejan A., Lorente S., The constructal law and the evolution of design in nature, *Physics of Life Reviews*, **8**, 3, pp. 209–240 (2011).
5. Smith A., *The Wealth of Nations* [1776], na, 1937.
6. Hayek F. A., *Individualism and Economic Order*, University of Chicago Press, 1980.
7. Mises L. v., *Human Action*, Ludwig von Mises Institute, 1949.
8. McNamara P., Hunt L., *Liberalism, Conservatism, and Hayek's Idea of Spontaneous Order*, Springer, 2007.