

The Evolution of Social and Economic Systems from the Perspective of Generalized Darwinism

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Abstract

This paper explores the application of the principles of Generalized Darwinism to explain the evolution of social and economic systems. Starting from fundamental concepts such as Lamarckism and Darwinism, the paper examines how these theories interpret complex social and economic phenomena. It highlights the subtle interplay between institutions, culture, and the evolutionary dynamics at both individual and collective levels, which play a crucial role in the evolutionary process. Generalized Darwinism offers a comprehensive perspective for observing social progress and economic transformation. However, its application to the evolution of social and economic systems also presents certain limitations.

Keywords

Darwinism; Generalized Darwinism; Social and Economic Systems.

1. Introduction

Darwinism originated in the field of biological evolution, but over time, its scope has expanded beyond its initial domain. From its original focus on biological survival and evolution, it has gradually extended to the evolution of social and economic systems. The primary aim of this paper is to investigate how Generalized Darwinism can be applied to broader research areas, providing theoretical support for understanding the complex evolution of social and economic systems.

Historically, discussions on evolution have been influenced by two major theories: Lamarckism and Darwinism (Wang Nanshi, 2021). Although these theories differ in their perspectives on evolution, their application to analyzing socio-economic issues has led to the development of what is now known as "Generalized Darwinism." This paper focuses on the three core elements of Darwinism—variation, selection, and inheritance—and their critical roles in the evolution of social and economic systems. These elements are further influenced by institutions and culture (Hodgson and Knudsen, 2010). While these elements are observable at both individual and collective levels, Generalized Darwinism, like all theories, has its limitations. Despite providing a robust theoretical framework, it may fall short in explaining certain complexities of social and economic evolution. This paper aims to explore these limitations in depth.

2. Literature Review

2.1. From Lamarckism to Darwinism

2.1.1. Lamarckism

Lamarckism, proposed by the French biologist Jean-Baptiste Lamarck in the early 19th century, was a significant evolutionary theory in its time. It sought to explain the origin and evolution of species through the inheritance of acquired characteristics (Dave, 2019). According to Lamarck, traits acquired by individuals during their lifetime could be passed on to their offspring (Cristiano, 2017). Lamarck argued that species evolved through individual adaptation and

effort in response to environmental changes. He believed that individuals could alter their traits by using or not using certain organs during their lifetime, and these changes could be inherited by subsequent generations (Taylan, 2020).

Lamarck illustrated his theory with the example of giraffes' neck elongation. He suggested that early giraffes stretched their necks to reach higher leaves due to food scarcity. Over time, this trait was inherited by their descendants, leading to the gradual elongation of giraffes' necks. This theory, known as "use and disuse," posits that the use or disuse of an organ influences its development and inheritance (Dave, 2019).

2.1.2. Darwinism

Although Lamarckism was influential in its time, it was gradually replaced by Darwin's theory of natural selection. Darwin's theory proposed that evolution was driven by natural selection, which operates through variation, inheritance, and differential survival and reproduction (Eoghan et al., 2022). Darwin emphasized the importance of genetic variation and adaptive advantage in species evolution. He argued that individuals with traits better suited to their environment were more likely to survive and reproduce, passing on their advantageous traits to the next generation (Salvatore et al., 2020).

Darwin also recognized that genetic variation arises from mechanisms such as mutations and genetic recombination, providing the raw material for natural selection (Pascal and Bertrand, 2020). He highlighted the gradual and continuous nature of evolution, where species adapt to environmental changes over generations through the accumulation of favorable traits.

In summary, Darwinism is a theory of biological evolution that emphasizes natural selection, genetic variation, and gradual, continuous evolutionary processes. It forms the foundation of modern biology and has profoundly influenced our understanding of species origins and diversity. While Darwin firmly believed in natural selection as the primary mechanism of evolution, he did not entirely dismiss the potential roles of use and disuse and the inheritance of acquired characteristics.

2.2. The Core Concepts of Generalized Darwinism

Generalized Darwinism extends the principles of Darwinism beyond biology to explain phenomena in social and economic systems. Its core idea is to interpret various phenomena and systems within an evolutionary framework (Hodgson and Knudsen, 2010).

A key concept in Generalized Darwinism is the evolutionary algorithm, which simulates natural selection to solve complex problems by mimicking genetic variation and selection processes (Cristiano, 2017). This algorithm iteratively refines solutions through competition and adaptive advantage. Additionally, Generalized Darwinism incorporates group selection, which emphasizes the role of collective traits in evolutionary success. According to group selection theory, certain group-level traits and behaviors can confer advantages to the group as a whole, even if they do not benefit individuals directly (Hodgson and Huang, 2012). This concept helps explain social behaviors such as morality and cooperation (Wang Huanxiang, 2012).

Generalized Darwinism applies evolutionary principles to a broader range of fields, including economics and social sciences. Hodgson (2010) argues that economics and other social sciences have long misunderstood and underestimated the methodological value of Darwinism. Darwinism encompasses a more general and inclusive set of ideas, applicable not only to biology but also to all complex open systems. It provides a philosophical foundation for detailed, cumulative, and causal explanations, making it fully applicable to socio-economic systems (Yang Hutaotao, 2011).

2.3. The Role of Generalized Darwinism in Explaining Social and Economic Evolution

Generalized Darwinism emphasizes the roles of variation, selection, and adaptive advantage in social and economic systems (Wang Fangrui, 2016). In social systems, it posits that interactions and competition among individuals and groups drive the evolution of social structures and behaviors. Individuals in social systems can be humans, organizations, or cultural groups, competing for resources, social status, and power (Wang Huanxiang, 2017). This competition leads to the retention and propagation of behaviors and structures that confer adaptive advantages.

In economic systems, Generalized Darwinism highlights the role of market competition and adaptive advantage in shaping industrial structures and economic behaviors. Economic actors, such as firms, entrepreneurs, and consumers, compete for resources and innovate to meet market demands. Firms that adapt effectively to market conditions and manage resources efficiently gain competitive advantages and thrive (Cristiano, 2017).

Generalized Darwinism also underscores the importance of information dissemination and selection in social and economic systems. Similar to the transmission of genes in biological systems, information in social and economic systems spreads through communication, media, and technology. Information that enhances adaptability and meets needs is more likely to be adopted and propagated, while less useful information is gradually eliminated (Reydon and Scholz, 2015). This process influences the patterns and directions of social and economic evolution (Hodgson and Knudsen, 2012).

2.4. Reconciling Lamarckism and Darwinism in Generalized Darwinism

Tikhodeyev (2020) argues that while Lamarckism and Darwinism conflict in biological contexts, they can be reconciled within the framework of Generalized Darwinism. In social and economic evolution, certain cultural practices and habits are created based on accumulated knowledge and experience, resembling Lamarckian inheritance. However, the dissemination and adoption of these practices align more closely with Darwinian natural selection. For example, an ancient agricultural community might develop a new farming technique that increases crop yields. Over time, other communities adopt this technique because it enhances their survival and reproduction. This example illustrates the fusion of Lamarckism and Darwinism within Generalized Darwinism.

By integrating Lamarckian and Darwinian perspectives, Generalized Darwinism provides a more comprehensive framework for analyzing the evolution of social and economic systems. It emphasizes the agency of individuals and organizations, the role of adaptive advantages, the importance of competition and selection, and the influence of self-organization and path dependence. This framework enhances our understanding of the development and transformation of social and economic systems. Generalized Darwinism in evolutionary economics goes beyond abstract analogies of Darwinian principles, deriving its foundations from the real processes observed in evolutionary biology.

3. Generalized Darwinism as a General Principle in Social and Economic Evolution

3.1. Variation

Variation is a fundamental concept in evolutionary studies, as it provides the raw material for adaptation and innovation. In biological systems, variation arises from genetic mutations and recombination. Similarly, in social and economic systems, variation manifests as diverse ideas, practices, technologies, and institutions. These variations can stem from individual creativity, experimentation, or external influences such as cultural diffusion or technological spillovers

(Hodgson, 2013). The importance of variation in social and economic systems cannot be overstated. Diverse ideas, practices, and technologies enable societies and economies to adapt to changing environments and innovate in response to new challenges and opportunities. For example, the rapid technological advancements of the digital age have spurred the emergence of new industries, business models, and social practices, which in turn have transformed the global economy and reshaped how people live and work.

3.2. Selection

Selection is the process by which certain traits or behaviors become more prevalent over time due to their relative advantages in a given environment (Aldrich et al., 2008). In biological systems, natural selection favors traits that enhance an organism's survival and reproductive success. In social and economic systems, selection operates through various mechanisms, such as market competition, social norms, or institutional constraints (Cristiano, 2017).

Market competition is a powerful selection mechanism in economic systems, as it drives the survival and growth of firms that better align with consumer preferences. For instance, the rise of e-commerce platforms like Amazon and Alibaba has disrupted traditional retail by offering greater convenience, lower prices, and a wider range of products, thereby capturing a larger market share.

Social norms and values also play a crucial role in shaping selection processes within social systems. Norms and values that promote cooperation, trust, and reciprocity can enhance social cohesion and stability. For example, the core socialist values in China contribute to the establishment of more inclusive and responsible political systems, thereby fostering social and economic development.

3.3. Inheritance

In biological systems, inheritance occurs through the replication and transmission of genetic material. In social and economic systems, inheritance can take various forms, such as the transmission of knowledge, skills, values, or resources. Learning and imitation are key mechanisms of inheritance in social and economic contexts, as individuals acquire knowledge, skills, and behaviors through observation, communication, or direct instruction (Aldrich et al., 2008). For example, the dissemination of scientific knowledge and technological innovations across societies has been a major driver of economic growth and development throughout history.

Institutions and culture also play a critical role in shaping the inheritance process within complex social and economic systems. Legal systems, educational organizations, and family structures can either facilitate or constrain the transmission of resources, knowledge, or values across generations (Tikhodeyev, 2020). Culture, in particular, provides shared beliefs, values, and practices that are transmitted through socialization, storytelling, or rituals. These cultural elements serve as the foundation for collective identity and continuity, enabling societies to preserve and propagate adaptive strategies over time.

4. The Evolution of Social and Economic Systems

4.1. The Role of Institutions in the Evolution of Social and Economic Systems

4.1.1. Definition and Importance of Institutions

From the perspective of social and economic evolution, institutions play a crucial role. Institutions are defined as a set of rules, norms, values, and organizational forms that constrain and guide social and economic behavior (Reydon and Scholz, 2015). They include legal regulations, government agencies, organizational structures, economic rules, and cultural values.

Institutions provide a framework of stability and predictability for social and economic systems. By establishing and enforcing laws, rules, and procedures, institutions ensure the reliability and consistency of social and economic interactions. This stability and predictability help reduce uncertainty and foster trust and cooperation (Dave, 2019). Tikhodeyev argues that institutions profoundly influence the behavioral patterns of individuals and organizations. They define rights and obligations, reward and punishment mechanisms, and market rules, shaping how people behave and what they expect. Through incentives and constraints, institutions influence the orientation and methods of social and economic behavior, guiding the choices of individuals and organizations.

Institutions also promote cooperation and coordination within social and economic systems. By establishing shared rules and values, they provide a foundation for collective action. For example, legal systems offer mechanisms for protecting rights and resolving disputes, economic systems provide rules for transactions and cooperation, and organizational systems create frameworks for coordination and management.

Moreover, institutions help individuals and organizations adapt to environmental changes. When social and economic environments shift, institutions can adjust rules and mechanisms to guide behavioral adaptation and innovation (Hodgson, 2012). Well-designed institutions enhance the flexibility and adaptability of systems, enabling them to better respond to changes and challenges.

Institutions themselves are also subject to evolution, continuously changing and developing over time. The evolution of institutions can occur through changes in laws and policies, as well as through social and economic transformations. Evolving institutions reflect the changing needs of social and economic systems, offering new opportunities and challenges.

4.1.2. How Institutions Facilitate Variation, Selection, and Replication

From the perspective of Generalized Darwinism, variation and innovation are key drivers of social and economic evolution. As a form of rules and organizational structures, institutions must also undergo variation and innovation to adapt to changing environments and demands. Within the framework of Generalized Darwinism, institutional variation and innovation can be achieved through adjustments in laws and policies, innovations in institutional design, and the evolution of social consensus (Hodgson and Knudsen, 2012).

Competition and selection are critical factors in the evolution of social and economic systems. Institutions provide the rules and mechanisms for competition, enabling individuals and organizations to compete within the constraints of the institutional framework. Institutions with adaptive advantages are more likely to survive and be selected, while maladaptive institutions may be replaced or eliminated. This process of competition and selection contributes to the evolution and progress of institutions (Dave, 2019).

Additionally, Generalized Darwinism emphasizes self-organization and path dependence. In the evolution of institutions, self-organization refers to the formation and development of institutions without central control. Various stakeholders in social and economic systems interact and adjust, leading to the emergence of new institutional arrangements (Pascal and Bertrand, 2020). At the same time, past choices and evolutionary paths influence current and future institutional development, creating path dependence. Generalized Darwinism views self-organization and path dependence as important drivers and patterns in the evolution of institutions (Aldrich et al., 2008).

As an evolving set of rules and organizational forms, institutions continuously adapt to and shape the development of social and economic systems through mechanisms such as variation and innovation, competition and selection, self-organization, and path dependence (Dave, 2019).

4.2. The Role of Culture in Social and Economic Evolution and Its Interaction with Other Factors

4.2.1. Definition and Importance of Culture

Culture shapes the shared values and normative systems within a society. These shared values and norms guide and regulate behavior in social and economic systems, influencing people's choices, actions, and decisions, thereby shaping the direction of social and economic evolution (Dave, 2019). Different cultural backgrounds lead to diverse beliefs and cognitive patterns, which in turn affect attitudes and behaviors toward social and economic issues (Pascal and Bertrand, 2020).

Culture is also closely related to social norms and institutions. Social norms are behavioral standards formed within a cultural context, while institutions are systems that regulate and organize social behavior (Cristiano, 2017). Social norms and institutions under different cultural backgrounds result in varied social and economic structures, influencing the evolutionary paths and outcomes of social and economic systems.

Furthermore, culture has a profound impact on technological innovation and economic development. Cultural values and beliefs can shape attitudes and behaviors toward innovation, affecting the pace and direction of technological progress. Culture itself is an evolving system. It adapts to environmental changes and is transmitted across generations through traditions, education, and socialization. In social evolution, culture may include the replication of habits, customs, rules, and conventions, all of which may carry solutions to adaptive problems. There must be mechanisms that ensure the persistence and replicability of these solutions, whether embedded in habits, conventions, or other forms.

4.2.2. The Role of Culture from the Perspective of Generalized Darwinism

Generalized Darwinism posits that the adaptability and survival capabilities of individuals or organizations play a key role in the evolutionary process (Hodgson, 2012). In social and economic systems, culture can be seen as an adaptive strategy, as it helps individuals and organizations adapt to environmental changes and provides shared behavioral guidelines and cognitive frameworks. By transmitting shared values, norms, and beliefs, culture offers individuals and organizations a strategy for survival and reproduction in specific environments. These shared cultural elements enable individuals and organizations to collaborate, compete, and interact with other participants in social and economic systems. By adhering to shared norms and values, individuals and organizations can achieve greater adaptability and competitive advantages in social and economic environments (Cristiano, 2017).

In social and economic systems, different cultural backgrounds and cognitive frameworks represent a form of diversity. This diversity provides a range of innovative and adaptive strategies for social and economic systems. Individuals and organizations can explore various behavioral approaches and problem-solving methods through cultural diversity, thereby enhancing adaptability and survival capabilities.

Moreover, the evolution of culture can be influenced by mechanisms of variation and selection. Cultural transmission and evolution occur through genetic models, learning, and teaching. In social and economic systems, successful cultural elements are more likely to be disseminated and adopted, while unsuccessful ones may be eliminated. Dave (2020) argues that this selection process drives the evolution and adaptive changes of culture. As an adaptive strategy, culture helps individuals and organizations achieve adaptability and competitive advantages in social and economic environments by transmitting shared values, norms, and beliefs (Taylan, 2020). At the same time, the diversity and evolution of culture are influenced by mechanisms of variation and selection, shaping the developmental trajectory of social and economic systems.

4.3. The Interaction Between Individual and Collective Levels of Evolution

4.3.1. The Relationship Between Individual and Collective Selection

Individual selection refers to the process by which individuals, through their adaptability and competitive advantages, acquire resources, survive, and reproduce in response to environmental changes. Individual selection focuses on the performance and outcomes of individuals in adaptation and competition (Pascal and Bertrand, 2020). Through mechanisms such as variation, inheritance, and adaptability, individual selection enables individuals to gradually adapt to their environment, enhancing their survival and reproductive success.

Collective selection, on the other hand, refers to the impact of competition and relative adaptability among different groups within social and economic systems (Hodgson and Knudsen, 2012). Collective selection emphasizes the influence of intergroup competition and cooperation on the overall adaptability and survival capabilities of groups.

The outcomes of individual selection shape the characteristics and behaviors of groups to some extent. During the evolutionary process, individual selection drives individuals to develop traits and behaviors that are adaptive to specific environments (Reydon and Scholz, 2015). When these individuals come together to form groups, their shared characteristics and behaviors influence the adaptability and competitive advantages of the group as a whole (Hodgson and Knudsen, 2012).

Intergroup competition and cooperation within collective selection also affect the adaptability and competitive capabilities of individuals. The mechanisms of competition and cooperation among different groups shape the behaviors and traits of individuals, influencing their ability to adapt to specific environments. Individuals may be influenced by the shared behavioral norms and culture of their group, which in turn affects their adaptability and survival capabilities (Cristiano, 2017). In this way, individual selection shapes the characteristics and behaviors of groups, while collective selection influences the adaptability and competitive capabilities of individuals through intergroup competition and cooperation.

4.3.2. The Role of Group Selection in Social and Economic Evolution

From an evolutionary perspective, group selection highlights the impact of competition and cooperation among groups on evolution. In social and economic systems, competition among different groups can drive the development of adaptive and cooperative mechanisms within groups (Hodgson and Knudsen, 2012). Cooperation and collaboration within groups enhance the overall adaptability and survival capabilities of the group, influencing its reproduction and expansion.

In social and economic systems, different groups may exhibit varying characteristics and behaviors that confer different levels of adaptability and competitive advantages (Dave, 2019). Through the process of evolutionary selection, traits of less adaptive groups may gradually diminish, while traits of more adaptive groups may become more prevalent. This evolution of group characteristics can influence the structure and nature of social and economic systems.

Hodgson (2008) argues that group selection also involves the spread and competition of culture and institutions. Differences in culture and institutions among groups can affect their adaptability and competitive advantages. In social and economic systems, successful cultures and institutions are often adopted and disseminated by other groups, while unsuccessful ones may be eliminated (Reydon and Scholz, 2015). This spread and competition of culture and institutions drive the evolution and transformation of cultural and institutional frameworks within social and economic systems.

Group selection does not imply the complete irrelevance of individual selection; rather, it emphasizes the importance of group-level selection in understanding evolution. Individual selection continues to play a significant role, but group selection takes into account the

interactions and competition among groups, providing a more comprehensive explanation of the characteristics and outcomes of social and economic evolution.

5. Challenges and Limitations of Applying Generalized Darwinism to Social and Economic Evolution

5.1. Complexity and Nonlinearity of Social and Economic Systems

Generalized Darwinism faces a series of challenges and limitations when applied to the evolution of social and economic systems. Although it provides a powerful framework for understanding the evolution of these systems, social and economic systems are highly complex, involving numerous participants, interactions, and causal relationships (Jiang Yuan, 2019). The simplified models of Generalized Darwinism struggle to fully capture the diversity and complexity of these systems. In social and economic evolution, genetic variation and natural selection are only a few among many factors, with culture, institutions, technology, politics, and other non-genetic elements also playing significant roles (Reydon and Scholz, 2015). Therefore, relying solely on Generalized Darwinism may be insufficient to fully explain the phenomena of social and economic evolution (Cristiano, 2017).

Tikhodeyev (2020) argues that the evolution of social and economic systems is often nonlinear and influenced by uncertainty. The theory of Generalized Darwinism, which is primarily based on the ideas of adaptability and survival of the fittest, struggles to account for nonlinear effects, path dependence, and unexpected events. The evolution of social and economic systems typically involves feedback loops, nonlinear relationships, and complex dynamics, which fall outside the scope of Generalized Darwinism.

5.2. Limited Explanatory Power for Cooperation

Generalized Darwinism emphasizes the role of competition and selection, but cooperation and reciprocity are also critical factors in the evolution of social and economic systems. Cooperative behaviors, such as collaborative production, cooperative innovation, and reciprocal exchange, play a key role in the development of societies and economies (Tikhodeyev, 2020). However, Generalized Darwinism provides a relatively weak explanation for cooperative behaviors, as it primarily focuses on the driving force of self-interest. Therefore, applying Generalized Darwinism alone to understand the evolution of cooperative behaviors may have limitations.

5.3. The Influence of Morality and Ethics

Generalized Darwinism tends to focus on adaptability and survival capabilities, but the evolution of social and economic systems is also influenced by values and moral considerations (Aldrich et al., 2008). Human behavior is often driven not only by natural selection but also by values such as morality, ethics, and fairness (Dave, 2020). The theory of Generalized Darwinism is relatively inadequate in explaining the impact of these non-biological factors on social and economic evolution.

Moreover, Generalized Darwinism is more inclined to describe and explain existing social and economic systems, offering limited guidance for social and economic reform. It focuses on the competition and adaptation of individuals and organizations within existing environments but provides little direction on how to change environments, shape institutions, or promote fairness and sustainable development.

6. Conclusion

This paper explores the application of Generalized Darwinism in the evolution of social and economic systems, highlighting how its core concepts—variation, selection, and inheritance—interact with cultural and institutional factors to drive the evolution of these systems. Generaliz

ed Darwinism provides a comprehensive perspective for understanding the complex dynamics of social and economic evolution, especially within the framework of competition and adaptive advantage. It reveals the crucial roles of both individuals and collectives in the evolutionary process of social and economic systems.

However, while Generalized Darwinism offers a valuable theoretical framework, it also presents certain limitations when applied to explaining the evolution of social and economic systems.

First, the complexity and nonlinearity of social and economic systems make it challenging for the simplified models of Generalized Darwinism to fully capture the diversity and intricate relationships within these systems. Second, Generalized Darwinism offers a relatively weak explanation for cooperative behaviors, especially in terms of non-self-interested actions and the influence of social ethics and values on evolution. Therefore, when applying Generalized Darwinism, it is essential to integrate other theoretical frameworks to address these gaps, in order to provide a more comprehensive understanding of the multifaceted evolution of social and economic systems.

In conclusion, Generalized Darwinism provides significant theoretical support for understanding social and economic evolution. However, its explanatory power is limited when it comes to addressing complex social behaviors, cooperative mechanisms, and the influence of ethics and values. Future research could explore how to incorporate these non-genetic factors and non-competitive mechanisms into the framework of Generalized Darwinism, thus forming a more robust theory of social and economic evolution.

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