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Annals of Business, Finance and Management

Perspective

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Vol. 10 (3), pp. 01-02, September, 2022
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Management of financial systems and applications of chaotic system

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Received: 15-Aug-2022, Manuscript no: ABFM-22-77758; **Editor assigned:** 17-Aug-2022, PreQC no. ABFM-22-77758 (PQ); **Reviewed:** 31-Aug-2022, QC no. ABFM-22-77758; **Revised:** 07-Sep-2022, Manuscript no. ABFM-22-77758 (R); **Published:** 14-Sep-2022, DOI: 10.51268/2736-1845.22.10.78.

DESCRIPTION

In recent years, it has been discovered that many scientific and engineering systems, including chemistry and ecology models, are chaotic. Examples of chaotic systems with significant applications in engineering and natural science include the Rossler chaotic system, the Chua chaotic circuit, and the Lorentz chaotic system family. Studies have also been done on more advanced multidimensional, multiscroll, and multiwing chaotic systems. Additionally, a great deal of research has been done on the dynamics of chaotic systems with temporal delays. The literature has also taken into account the chaos that exists in many financial systems. These models demonstrate how the interplay between financial variables can result in intricate occurrences that are challenging to evaluate. The great sensitivity of chaotic systems to their beginning conditions is an important trait. Very small variations in the starting state of chaotic systems will result in significant variations in the systematic paths. Global boundedness is another property of chaotic systems. Numerous chaotic systems' global boundedness has been researched in the literature.

New synchronisation tracking technique

Chaos produces erratic and unpredictable outcomes. Therefore, it has practical application value to entirely suppress or eliminate chaos in nonlinear dynamic systems. The literature's groundbreaking work on chaotic synchronisation employed a range of control measures to suppress disorder. Chaos synchronisation has received a lot of attention lately. A new synchronisation tracking technique for uncertain discrete networks with spatiotemporal chaos behaviours was studied, along with the synchronisation control of an unusual chaotic system with an exponential term and coexisting attractors. The synchronisation of chaotic systems has been extensively studied and investigated as a route to broadband optical chaos generation and synchronisation using dual-path optically injected semiconductor lasers. A hybrid approach for the development of digital chaos and local synchronisation was examined in relation to the difference between synchronisation among three chaotic systems.

The given system is based on a set of differential equations that depict how various components of the financial system interact with one another. Chaos was sparked by the interplay between these components. The financial system will be exposed to unanticipated risks due to the chaos phenomenon. Consequently, system control is crucial a set of control regulations to bring the system into synchronicity. Research sheds light on how the financial sector manages risk hedging. This article's goal is to use controls and feedback to synchronise the chaotic system represented by the financial model. Additionally, we use the Lyapunov direct approach to support our findings. To confirm the effectiveness of the controls that were designed, we also ran numerical simulations.

CONCLUSION

In this article, we look at how a financially hyperchaotic system synchronises. Development of suitable control strategies to synchronise the two similar financial systems with various initial conditions by researching the model's features there are mathematical demonstrations of the control law's efficiency. Additionally, we run numerical simulations to verify the viability and effectiveness of the developed control mechanisms as a result, the controls suggested in this study offer ways to develop synchronous chaotic systems. This is a significant addition to this work because of the unpredictability and uncertainty that result from a financial system's chaotic behaviour. In contrast, a synchronised financial system allows for risk hedging because it is predictable this study offers insights into the risk management of financial systems that are chaotic.