Chapter 1
Artificial Intelligence in Detecting Herding and Market Overreaction:
Specifying Impact of Behaviors on Market Dynamics

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ABSTRACT

Herding behavior, where individuals in a group act collectively without centralized direction, is a phenomenon observed in various domains, including financial markets, consumer behavior and social media trends. Detecting herding behavior is crucial for understanding market dynamics, predicting economic crises, and managing risks. Artificial Intelligence (AI) has emerged as a powerful tool in identifying and analyzing herding patterns due to its ability to process vast amounts of data and uncover complex patterns that are not easily visible through traditional methods. The future of AI in this industry is optimistic, with continued developments promising even higher efficiency and accuracy, despite the limitations. AI will grow more sophisticated in its application to herding behavior detection as it develops, enabling

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more informed risk management and decision-making. This chapter explores the role of AI in detecting herding, highlighting its applications, benefits, challenges and future prospects.

1. INTRODUCTION

Herd behavior occurs when individuals in a group follow the actions of others instead of relying on their own information or analysis. This can lead to significant market movements, asset bubbles, and crashes. Key areas where herd behavior is observed include Financial Markets: Investors often mimic the trades of others, creating market trends that can result in bubbles or crashes; Consumer Behavior: Buyers purchase products that are popular or trending, often influenced by social proof and peer recommendations; Social Media: Viral trends and the rapid spread of information or misinformation can be attributed to herd behavior among users. In many different sectors, artificial intelligence is essential for identifying herding behavior. It is a priceless tool for social media monitoring, consumer behavior analysis, and the financial markets because to its capacity to handle massive information, reveal intricate patterns, and generate predictive insights. A phenomenon known as "herd behavior" occurs when people behave collectively as members of a group, often coming to conclusions as a group that they would not have individually (Hussain & Alaya, 2024).

Herd behavior may be explained by one of two commonly recognized theories as to begin with, people are driven by social pressure to fit in by imitating the behaviors of others, even when such behaviors go against their innermost desires. Secondly, people often find it hard to accept that a sizable group may be erroneous and end up adopting the group's actions because they mistakenly think that the collective knows something that the individual does not. When a large number of people adopt the same conduct mostly because that is what everyone else is doing, it is known as herding. This phenomenon may happen in a variety of settings, including investing, shopping and sports (Jagirdar & Gupta, 2024).