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Master Thesis

Herd Behavior in Asian Stock Markets: A Meta-Analysis

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Summary

The thesis examines herd behavior in Asian stock markets through a meta-analytical approach to understand its manifestation during financial crises compared to normal conditions. The focus on Asian markets is relevant due to their significant growth and diverse economic and regulatory landscapes.

The study delves into herd behavior, defined as investors following others' trades rather than using independent analysis. This behavior often leads to market inefficiencies and contradicts the Efficient Market Hypothesis. It integrates behavioral finance theories to provide a comprehensive understanding of market dynamics.

A systematic meta-analysis was conducted, rigorously selecting empirical studies on Asian markets to ensure a robust analysis. The findings reveal that herd behavior is widespread across all Asian stock markets, though its intensity varies among different exchanges and is influenced by local conditions and regulations. Notably, herd behavior intensifies during periods of high volatility, such as financial crises, driven by heightened uncertainty and risk.

The thesis highlights the complexity of financial markets and challenges traditional theories by demonstrating the significant impact of herd behavior. It advocates for nuanced financial regulation and informed investor strategies to enhance market stability and efficiency. The insights could assist in developing policies to mitigate risks associated with herd behavior and improve investment decisions, especially during market stress.

Overall, the thesis enriches the understanding of market dynamics in Asian contexts, offering valuable insights for investors, policymakers, and academics focused on financial market behavior and regulation.

1. Introduction

Herding behavior in stock markets refers to the phenomenon where investors imitate others' trades instead of conducting their independent analysis. This behavior often contradicts the rational decision-making models proposed by classical financial theories, such as the Efficient Market Hypothesis. According to this hypothesis, all investors act independently and are fully informed, leading markets to always reflect all available information (Fama, 1970). However, herding can lead to market inefficiencies and deviations from fundamental values, as investors collectively react to the actions of others rather than to actual market signals.

The interest in herding behavior expands beyond theoretical finance, drawing attention to behavioral finance, which examines the psychological and sociological influences on investor behavior (Shiller, 1995). Herding can be seen as a rational response to uncertainty and an irrational panic reaction, which can exacerbate market volatility and contribute to the formation of bubbles and crashes (Devenow & Welch, 1996).

Empirical studies on herding behavior have been fueled by notable market events, such as the Asian Financial Crisis, the technology bubble, the global financial crisis of 2008, and Covid-19 where deviations from market efficiency were stark. These events prompt questions about the underlying factors contributing to herding behavior and its impact on market stability and efficiency(Choijil et al., 2022).

The Asian markets are among the most rapidly evolving economic regions globally, with nations such as China, India, and South Korea demonstrating substantial growth in their financial sectors. This growth has significantly impacted global economic patterns, underscoring the importance of these markets in worldwide finance (Bradley et al., 2023). The diversity within Asian financial markets, ranging from the advanced systems of Japan to the developing frameworks of Vietnam and Indonesia, presents a rich tapestry for investigating how various factors influence investor behavior, particularly herd behavior. A meta-analytical approach enables a thorough exploration of these nuances,

clarifying the influence of market maturity and regulatory environments on investment practices.

From a practical perspective, a more profound comprehension of herd behavior in Asian markets can inform and enhance regulatory frameworks and financial policies. Policymakers can devise strategies to curb market irregularities and stabilize economic conditions by identifying when and how herd behavior tends to manifest. For investors and financial strategists, insights derived from a meta-analysis can refine investment approaches, allowing for better-timed decisions in market entries and exits that potentially maximize returns and minimize risks.

Moreover, conducting a comprehensive meta-analysis on herd behavior enhances risk management techniques. By pinpointing specific conditions under which investors are likely to herd, financial institutions and individual investors can develop strategies to mitigate these risks. This approach not only safeguards investments but also contributes to the overall stability of the financial markets.

In light of these considerations, the current thesis addresses a critical gap in the existing literature: the comparative dynamics of herd behavior in Asian stock markets during periods of crisis versus conditions of normal market operations. To this end, this research employs a meta-analytical approach, enabling a rigorous and comprehensive comparison. The primary question guiding this study is: "How consistent are the empirical findings regarding the manifestation of herding behavior in Asian stock markets during financial crises compared to normal periods?"
Such a comparative analysis aims to unravel the complexities of investor behavior under varying economic conditions, providing nuanced insights that can drive more informed regulatory and investment strategies.

In conclusion, the aggregation and synthesis of extensive research through a meta-analytical approach enrich our comprehension of herd behavior in diverse market conditions and ensure that findings are robust, nuanced, and widely applicable. This method leverages the breadth of available data to provide a more precise understanding of the complex dynamics that characterize Asian financial markets, thus offering invaluable insights crucial for theoretical exploration and practical application in finance.

2. Literature Review

Understanding investor behavior in financial markets is crucial for theoretical and practical finance. Herding behavior, where investors follow the actions of others rather than relying on independent analysis, presents a complex challenge that often contradicts classical economic theories. This phenomenon is particularly pronounced during market instability and can have significant financial implications.

This section dissects the theories that explain herding behavior, providing insight into why investors choose collective conformity over independent decision-making. By introducing and examining these theories alongside the methodologies used to quantify such behaviors, mainly through meta-analysis, this framework sets the groundwork for a deeper empirical investigation. Through this dual approach, we understand the theoretical constructs and prepare for a detailed analysis of herding patterns in subsequent sections.

Noise Trader Theory proposes that irrational actions by certain market participants can disproportionately influence overall market trends (Shleifer & Summers, 1990). This theory is particularly pertinent for explaining instances of herding that seem disconnected from fundamental market values, which is a common occurrence in the rapidly fluctuating markets of Asia during economic upheavals (Aslam et al., 2021).

Next, Prospect Theory, developed by Kahneman and Tversky, offers a nuanced perspective on decision-making under risk and uncertainty. This theory suggests that investors often make decisions based on potential gains and losses framed relative to a particular reference point rather than absolute outcomes (Kahneman & Tversky, 1979). This is crucial in understanding investor behavior in Asian financial markets, where risk perception can dramatically shift during crises, leading to more pronounced herding behaviors as investors gravitate towards seemingly safer, majority-followed strategies (Loxton et al., 2020).

Information Cascade Theory explains how investors might abandon their

information and analyses in favor of imitating the actions of others, mainly when the environment is fraught with high uncertainty and volatility (Bikhchandani et al., 1992). This tendency is exacerbated during market turmoil, such as the Asian Financial Crisis or the more recent market disruptions caused by geopolitical tensions, where the rapid spread of investor actions resembling an information cascade can lead to significant market corrections or bubbles.

Herding behavior in financial markets can be categorized into two main types: intentional herding and spurious herding. Intentional herding occurs when investors deliberately choose to follow the actions of others, either because they believe other investors possess superior information or due to the psychological comfort of conforming to the majority. This behavior is often based on the rational choice to minimize risk or maximize returns by aligning with the perceived wisdom of the crowd (Qiao et al., 2014; Scharfstein & Stein, 1990). In contrast, spurious herding appears as if investors are following each other, but it results from responding independently to the same external information or market signals. Here, the herding-like patterns are coincidental and do not stem from direct mutual influence among investors (Cipriani & Guarino, 2005). This type of herding is particularly complex because it can mask actual herding behavior, complicating the analysis of market dynamics and the assessment of market efficiency (Hirshleifer & Hong Teoh, 2003).

In financial markets, information asymmetry occurs when one party in a transaction has more or better information than the other. In stock markets, when investors are perceived to have superior information, others may follow their trades, a fundamental herding mechanism. Information asymmetry is particularly pronounced during market crises when uncertainty is high and reliable information is more valuable. Empirical studies, such as those by Easley and O'Hara, have shown that higher levels of asymmetric information can lead to increased herding behavior, as investors are more likely to follow the actions of those presumed to be better informed (Easley & O'hara, 2004). This dynamic is crucial for understanding market anomalies and inefficiencies, especially in Asian economies where markets are often less transparent and more volatile. These characteristics tend to exacerbate inefficiencies in emerging markets (Jain et al.,

2017).

In examining herding behavior within Asian stock markets, this thesis utilizes established quantitative models to detect and analyze trends. A pivotal tool in this analysis is the Cross-Sectional Absolute Deviation (CSAD), widely adopted in empirical finance to measure herding intensity. CSAD assesses the degree to which individual stock returns converge towards the market average, providing a robust indicator of herding during different market conditions (Chang et al., 2000). By leveraging CSAD alongside other statistical tools, this study aims to quantitatively dissect herding behavior during periods of financial crises compared to normal market conditions, offering a precise evaluation of market dynamics and investor behavior. This meta-analytical approach enhances the understanding of herding phenomena and enriches the empirical framework that supports broader financial theories.

Meta-analysis is a statistical method used to combine the results of multiple studies, providing a more precise effect of the results through quantitative synthesis. This technique is crucial for systematic reviews integrating findings across varied research contexts, mainly when individual studies alone are too small to yield definitive conclusions (Grant & Booth, 2009). In finance, where diverse methodologies and measures can vary widely, meta-analysis helps standardize these differences to pull coherent insights from scattered data market stress or how it differs across developed and emerging Asian markets.

Due to their diverse characteristics, meta-analysis is exceptionally suited to studying herding behavior in Asian financial markets. The methodology allows for examining consistent patterns and outlier behaviors across regulatory environments and market conditions. This approach can significantly enhance our understanding of how and why herding occurs in these economically significant regions by ensuring that studies included in the meta-analysis measure similar outcomes in comparable ways.

To ensure validity and reliability, a meta-analysis must carefully select sufficiently similar studies in their populations, interventions, and outcomes. Additionally, addressing potential biases such as publication bias is critical.

Techniques like funnel plots and sensitivity analyses are employed to detect and adjust for these biases, ensuring that the meta-analysis provides a balanced and comprehensive view of the available evidence.

Publication bias occurs when studies' outcomes influence their likelihood of being published. Studies yielding statistically significant or positive results are more likely to be published than studies with non-significant or adverse outcomes. This bias can lead to a skewed understanding of research topics because the published literature may need to represent all the scientific evidence accurately. Meta-analyses, which often rely solely on published data, are particularly susceptible to this bias, potentially leading to overestimations of effect sizes or incorrect conclusions about the efficacy of interventions (Dickersin, 2005).

A funnel plot is a scatterplot that visualizes the relationship between study size and effect size. It helps in detecting publication bias in meta-analyses. Without bias, the plot resembles a symmetrical inverted funnel because more extensive studies will cluster around the mean effect size, with increasing scatter as the study size decreases. Asymmetry in this plot can suggest the presence of publication bias, where smaller studies that do not show significant results are missing from the analysis (Sterne et al., 2005).

Sensitivity analysis in the context of meta-analysis examines how the overall results vary when the analysis includes or excludes particular studies. This technique assesses the robustness of the conclusions drawn from a meta-analysis. If the conclusions change significantly based on the inclusion or exclusion of specific studies, the results may not be robust and could be influenced by particular studies' methodologies or biases (Mathur & VanderWeele, 2020).

3.0 Methodology

3.1 Research Design

This meta-analysis consolidates quantitative findings from previous studies on herding behavior in stock markets, particularly during financial crises. The design follows a systematic review approach, synthesizing empirical data from various academic publications to uncover broader trends and insights that individual studies might not reveal alone.

3**.2 Data Collection Strategy**

To address the research question, "How consistent are the empirical findings regarding the manifestation of herding behavior in Asian stock markets during financial crises compared to normal periods?" we have developed a targeted search strategy tailored to capture all relevant literature. This strategy is implemented across three major databases known for their extensive coverage of finance and economics: Business Source Complete, Web of Science, and Science Direct.

3.2.1 Search Strategy for Article Selection

Our search strategy is crafted to identify studies that specifically analyze herding behavior in stock markets during distinct market conditions, regular periods, and financial crises. Given the regional focus on Asian markets, our keywords and search parameters are chosen to include geographic identifiers relevant to Asia, such as specific countries and major Asian stock exchanges. This regional specificity ensures that the cultural, economic, and regulatory contexts pertinent to Asian markets are adequately represented in our analysis.

We include filters to select studies published between 2010 and 2024. This period is chosen to ensure the inclusion of the most recent financial crises, such as the Asian financial crises, and subsequent recovery periods, which allows us to examine shifts in herding behavior over time. Special attention is given to identifying studies that compare herding behavior during periods of financial stability versus times of crisis. This dual focus is critical for addressing the

research question as it enables an analysis of how market stress influences investor behavior in Asian markets.

Our search strategy also prioritizes empirical studies utilizing recognized quantitative herding measures, such as CSAD. This metric is essential for rigorously quantifying herding behavior and comparing different studies.

3.2.2 Implementation

Each database is leveraged for its unique strengths. Business Source Complete is utilized for its comprehensive business and economic publications coverage. Web of Science was selected for its interdisciplinary reach and exceptional citation tracking capabilities, which help identify seminal and highly cited works. Science Direct is chosen for its access to high-quality research published by Elsevier, particularly recent studies featuring sophisticated quantitative analyses.

We conduct a cross-database search to maximize literature coverage and ensure no relevant study is overlooked. This approach involves using consistent thematic keywords across databases while adjusting for each database's specific indexing and search functionalities. We also manually check the reference lists of all retrieved articles to identify additional relevant studies, ensuring comprehensive data collection. The studies must provide empirical data addressing herding behavior under different market conditions in the designated Asian markets.

Implementing this detailed search strategy ensures robust and comprehensive data collection to address our research question effectively. This approach allows us to systematically review and synthesize findings from various studies, providing a nuanced understanding of how economic cycles and crises influence herding behavior in Asian stock markets.

Journal	Search	Number of articles
Business Source complete	AB (("herd behavior" OR "herding")) AND AB stock market NOT (animal or animals) AND TX (("CSSD" OR "CSAD")) AND (("China" OR "India" OR "Indonesia" OR "National Stock Exchange" OR "Shanghai Stock Exchange" OR "Shenzhen Stock Exchange" OR "Hong Kong Stock Exchange" OR "Tokyo Stock Exchange" OR "Bombay Stock Exchange" OR "Pakistan" OR "Japan" OR "Vietnam" OR "Iran" OR "Turkey"))	20
Web Of Science	"herd behavior" OR "herding" (Abstract) AND stock market (Abstract) NOT "animal" or "animals" (All Fields) AND "CSSD" OR "CSAD" (All Fields) AND "China" OR "India" OR "Indonesia" OR "National Stock Exchange" OR "Shanghai Stock Exchange" OR "Shenzhen Stock Exchange" OR "Hong Kong Stock Exchange" OR "Tokyo Stock Exchange" OR "Bombay Stock Exchange" OR "Pakistan" OR "Japan" OR "Vietnam" OR "Iran" OR "Turkey" (All Fields)	11
Science Direct	herd behavior OR "herding" (Abstract) AND stock market (Abstract) NOT "animal" or "animals" (All Fields) CSSD OR CSAD AND China India Indonesia "National Stock Exchange" "Shanghai Stock Exchange" "Shenzhen Stock Exchange" "Hong Kong Stock Exchange" "Tokyo Stock Exchange" "Bombay Stock Exchange" Pakistan Japan Vietnam Iran Turkey NOT Animal (All fields)	12

3.3 Inclusion and Exclusion Criteria

To ensure the integrity and relevance of our meta-analysis on herding behavior in Asian stock markets during financial crises compared to regular periods, we have established specific inclusion and exclusion criteria. These criteria are the foundation for our literature selection process, ensuring that each study we include offers robust, empirical data that can be reliably synthesized and compared.

3.3.1 Inclusion Criteria

Each study considered for inclusion must explicitly analyze herding behavior in stock markets using quantitative methods and recognized measures such as the Cross-Sectional Absolute Deviation (CSAD) or the Cross-Sectional Standard Deviation (CSSD). Using these standardized metrics is crucial as it allows for comparability across different studies and ensures our analysis is grounded in empirical evidence.

Moreover, studies must report primary data outcomes and be published in peer-reviewed journals between 2010 and 2024. This timeframe is specifically chosen to capture the most recent financial crises and subsequent market conditions,

enabling us to examine the latest shifts in herding behavior within modern financial dynamics. Additionally, only studies that pertain to Asian stock markets are included to maintain a focus on the specificities of regional market behavior. This regional specificity ensures that the cultural, economic, and regulatory contexts pertinent to Asian markets are adequately represented in our analysis.

3.3.2 Exclusion Criteria

Conversely, we exclude theoretical analyses, conceptual frameworks, review articles, and purely qualitative studies, as these do not provide the quantifiable data necessary for our statistical synthesis.

Furthermore, studies that report duplicate data or focus on non-stock markets like bonds or commodities are excluded to prevent redundancy and potential bias. These topics do not directly pertain to the dynamics of equity markets and may involve different investor behaviors, which are outside the scope of our study.

Rigorously adhering to these criteria ensures our meta-analysis incorporates only relevant, high-quality, comparable studies. This careful selection process enhances the validity and reliability of our conclusions, allowing us to review and synthesize findings from various studies systematically. The nuanced understanding we gain from this process sheds light on how herding behavior in Asian stock markets is influenced by economic cycles and crises, providing valuable insights into market dynamics during turbulent and stable periods.

3.4 Methodological Details

In our analysis of the methodologies employed in the studies, we focus on aspects that underscore the robustness and applicability of the findings. We examine the research design, whether longitudinal, cross-sectional, or experimental, as it influences how results are interpreted concerning causality and correlation. Longitudinal studies, for example, are invaluable for observing changes in herding behavior over time and assessing its long-term effects.

Each study's sample size is also critically evaluated because it affects the statistical power and generalizability of the results. Larger sample sizes generally

provide more reliable insights and enhance the robustness of statistical analyses, while smaller samples may require cautious interpretation.

Only studies that derive their data from well-established stock exchanges or comprehensive financial databases are included. Such sources provide more accurate and credible data, crucial for a robust analysis of market behaviors. In this way, we ensure the reliability and relevance of the information we analyze, aligning with the standards set by high-quality research practices. This approach helps guarantee that the findings and conclusions drawn from our meta-analysis are based on sound and trustworthy empirical evidence.

This comprehensive data extraction and management strategy ensures that our meta-analysis is transparent and methodologically sound. This meticulous approach enriches our understanding of the dynamics of herding behavior. It enhances our conclusions' reliability and validity, providing a robust framework for understanding how economic cycles and crises influence herding behavior in Asian stock markets.

3.5 Analytical Techniques

3.5.1 Statistical Tools for Meta-Analysis

Meta-analysis is a robust statistical approach used to combine and synthesize results from multiple studies to understand the effect size across a field of interest comprehensively. The “Metafor" package in R was selected for this thesis due to its comprehensive array of functions for conducting meta-analyses and its ability to handle complex models and data structures.

Given the expected variability among the outcomes of studies investigating herding behavior in Asian stock markets, a random-effects model was deemed appropriate. Unlike a fixed-effect model, which assumes one true effect size underlies all study results, a random-effects model accommodates variations between studies, considering that different studies estimate different yet related effects. This model is instrumental in finance, where effects may vary

significantly across various contexts and market conditions (Borenstein et al., 2010).

Model Outputs:

- **Tau² (Tau-squared)**: This statistic represents the estimated variance of the underlying effect sizes across studies. A higher Tau² indicates more variability among the true effects, suggesting that factors other than sampling error contribute to the observed differences. (J. P. T. Higgins & Thompson, 2002)
- **I² (I-squared)**: Developed by Higgins and Thompson (2002), this statistic describes the percentage of variation across studies due to heterogeneity rather than chance. I² values closer to 100% indicate substantial heterogeneity, whereas values near 0% suggest homogeneity among the effect sizes. I² is particularly informative as it is unaffected by the number of studies in the meta-analysis, providing a scale-invariant measure of heterogeneity's impact (J. P. T. Higgins & Thompson, 2002).
- **H² (H-squared)**: This index reflects the ratio of total observed variance to the variance within studies. A value greater than 1 indicates the presence of heterogeneity, with larger values suggesting greater variability among the true effects (Cochran, 1954).

3.5.2 Assessing Heterogeneity, Publication Bias and Sensitivity

Heterogeneity among studies in a meta-analysis can significantly affect the interpretation of the overall results. It was assessed in this analysis using the Q statistic, which tests the null hypothesis that all studies are estimating the same underlying effect size. A significant Q statistic rejects this hypothesis, suggesting variability in effect sizes beyond chance alone (J. P. T. Higgins & Thompson, 2002).

Sensitivity Analysis: To determine the robustness of our meta-analytical results, a sensitivity analysis was performed by recalculating the overall effect size, omitting one study at a time. This process helps identify any individual study's

influence on the overall meta-analysis estimate. Tools such as Cook's distance, DFBETAs, and covariance ratios were employed to assess the impact of each study:

- **Cook's distance** measures the influence of each data point (study) on the fitted values (Cook, R. D., 1977).
- **DFBETAs** indicate how much a parameter estimate changes if the study is omitted (Belsley, 1980).
- **Covariance ratios** provide insights into the variability of the estimates with and without each study (Cochran, W. G., 1957).

These analyses are crucial for ensuring that the conclusions drawn from the meta-analysis are not unduly influenced by any single study, thereby enhancing the credibility and reliability of the findings.

4.0 Results

4.1 Descriptive Statistics of Included Studies

This meta-analysis reviewed 12 studies that yielded 18 outcomes, focusing exclusively on herding behavior within Asian stock markets. This geographic focus reflects the analysis's aim to understand market dynamics, specifically in this region known for its unique economic and regulatory environment.

The studies analyzed span 2005 to 2024, covering various market conditions, from regular periods to financial crises. This temporal range provides a comprehensive view of investor behavior across various Asian market scenarios, encompassing notable stock exchanges in China, Iran, India, Vietnam, and Taiwan. Sample sizes across these studies varied significantly, ranging from a minimum of 216 to a maximum of 2,901 observations. This variability highlights the diverse methodologies and scopes of the investigations included in our analysis.

The studies predominantly employed quantitative methods regarding analytical techniques, focusing on herding measures such as Cross-Sectional Absolute Deviation (CSAD). These measures are critical for assessing the degree to which investors mimic the market or each other, providing insights into collective behavior during market volatility and stability periods. This descriptive overview

sets a foundation for deeper insights into the synthesized results and specific analytical techniques applied in subsequent sections, offering a nuanced understanding of herding dynamics within Asian financial markets.

4.2 Synthesis of Herding Measures Across Studies

The synthesis of herding measures involved analyzing the effect sizes and standard errors from 18 distinct results derived from 12 different studies focused on Asian stock markets. This diverse dataset encompassed various market conditions, from everyday trading environments to financial crises, capturing various investor behaviors across different geographic regions, including China, India, Taiwan, Vietnam, and Iran.

4.2.1 Key Findings

Increased Herding During Crises: Consistent with the literature on behavioral finance, our analysis confirms an uptick in herding behavior during periods of financial turbulence (Chiang, Zheng, & Zhu, 2010; Lao & Singh, 2011). This tendency is particularly pronounced in markets that experienced high volatility or were subject to impactful economic or political events, which may enhance investors' propensity to follow the crowd due to heightened uncertainty and risk aversion.

Variability Across Markets: The measures of herding, specifically CSAD, exhibited considerable variability. This variability underscores the differential impact of local market conditions, regulatory frameworks, and economic climates on investor behavior. For example, studies conducted in China and India, two vastly different regulatory and informational environments, showed distinct herding intensity and frequency patterns.

The synthesized findings enhance our understanding of the complexities involved in market dynamics, particularly in how different types of markets and varying conditions affect investor behavior. The detailed analysis not only supports existing theories in behavioral finance regarding herding but also provides empirical backing for regulatory considerations on how to mitigate excessive herding, especially during times of market stress

The meta-analysis on herding behavior in Asian stock markets synthesized data from 12 studies, yielding 18 distinct datasets. The results provide a robust statistical overview, combining findings across various market conditions and crises to assess the overall tendency towards herding behavior in these markets.

4.3 Meta-Analysis Results

The meta-analysis combined data from 12 studies, yielding 18 distinct datasets. These studies analyzed herding behavior in various Asian stock markets under different market conditions, including periods of financial crises and stability. Due to the expected variability between studies, this synthesis employed a random-effects model. The statistical execution and outcomes of this model provide insights into both the central tendencies and variations within the collected data.

4.3.1 Statistical Model and Interpretation

Utilizing the "metafor" package in R, the analysis implemented a random-effects model with restricted maximum likelihood estimation (REML). This model is appropriate given the heterogeneity across studies concerning sample sizes, methodologies, and market conditions.

Model Parameters

Tau^2 (Tau-squared): This statistic was estimated at 0.4955 (SE = 0.1700), indicating significant heterogeneity among the effect sizes. This suggests that the variance in herding behavior across studies is substantial.

I^2 (I-squared): At 100%, this value signals that virtually all variability in effect size estimates is due to heterogeneity rather than chance, emphasizing the impact of diverse market conditions on herding behavior.

H^2 (H-squared): The extraordinarily high value of 6118628.09 reflects the vast range of effect sizes and underscores the complexity of influences beyond mere sampling error.

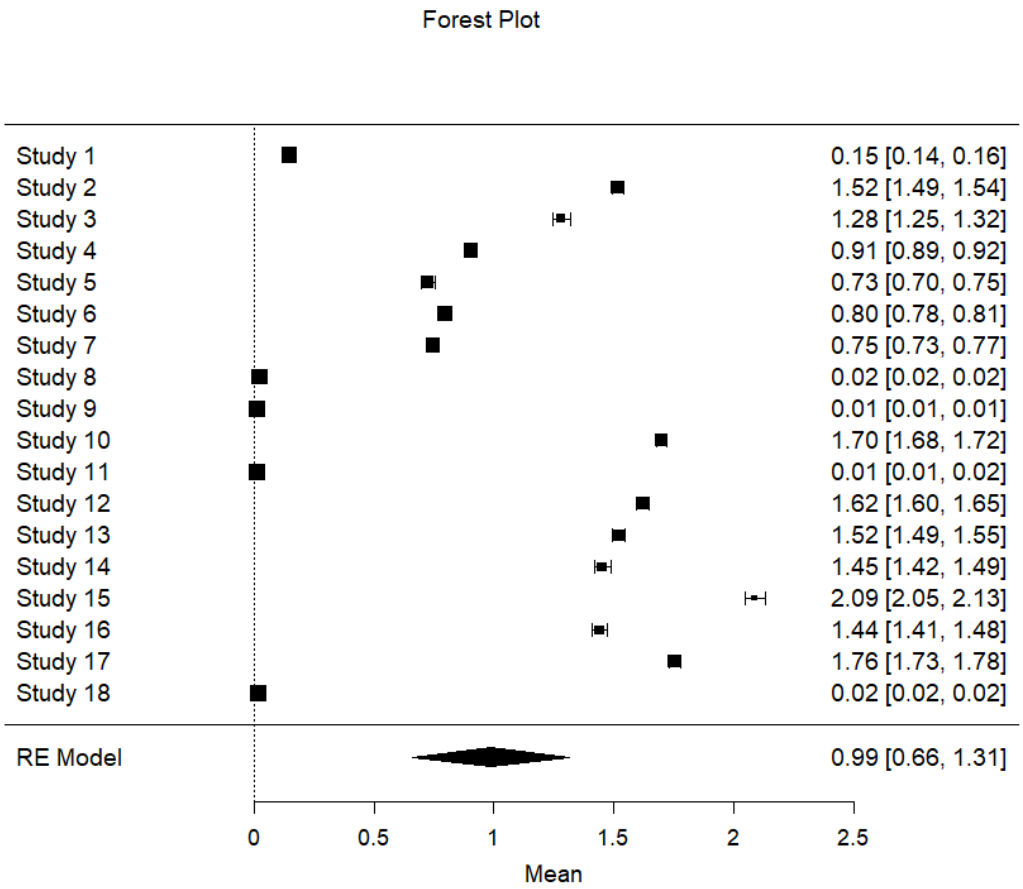
Effect Size Estimation

The aggregated effect size was 0.9877 with a standard error of 0.1659, achieving statistical significance ($p < .0001$). The 95% confidence interval ranged from

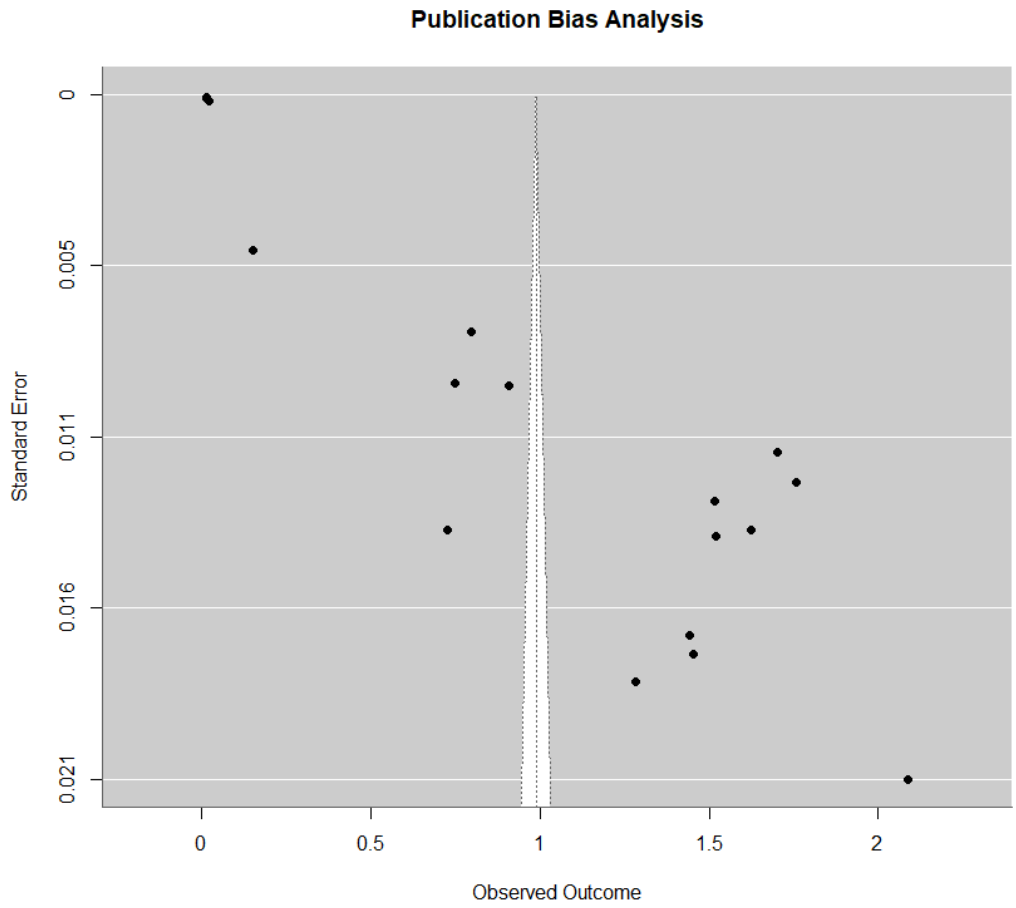
0.6625 to 1.3130, affirming the robust presence of herding behavior across the surveyed Asian stock markets.

4.3.2 Visualizations for Insight

Forest Plot: This graphical representation details the individual and collective effect sizes along with their confidence intervals, visually summarizing the contributions and disparities among the included studies.



Funnel Plot: This plot's symmetry was scrutinized to identify any systematic biases that might arise from the non-publication of studies with smaller or non-significant effects. It was employed to assess publication bias.



4.3.3 Sensitivity Analysis

Sensitivity analysis was conducted using various influence measures to ascertain the impact of individual studies on the overall meta-analysis outcomes. Key diagnostics such as Cook's Distance (cook.d), Covariance Ratios (cov.r), Residual Studentized Deleted (rstudent), Difference in Fits (dffits), Tau² Delta (tau2.del), and Q and E Deletion (QE.del) were utilized to identify influential studies that may skew the analysis.

General Findings

Residual Studentized Deleted (rstudent) and **Difference in Fits (dffits)** identified specific studies that significantly diverged from the collective effect sizes. These outliers indicate that certain datasets disproportionately influence the meta-analysis, potentially leading to skewed interpretations of the overall market behavior.

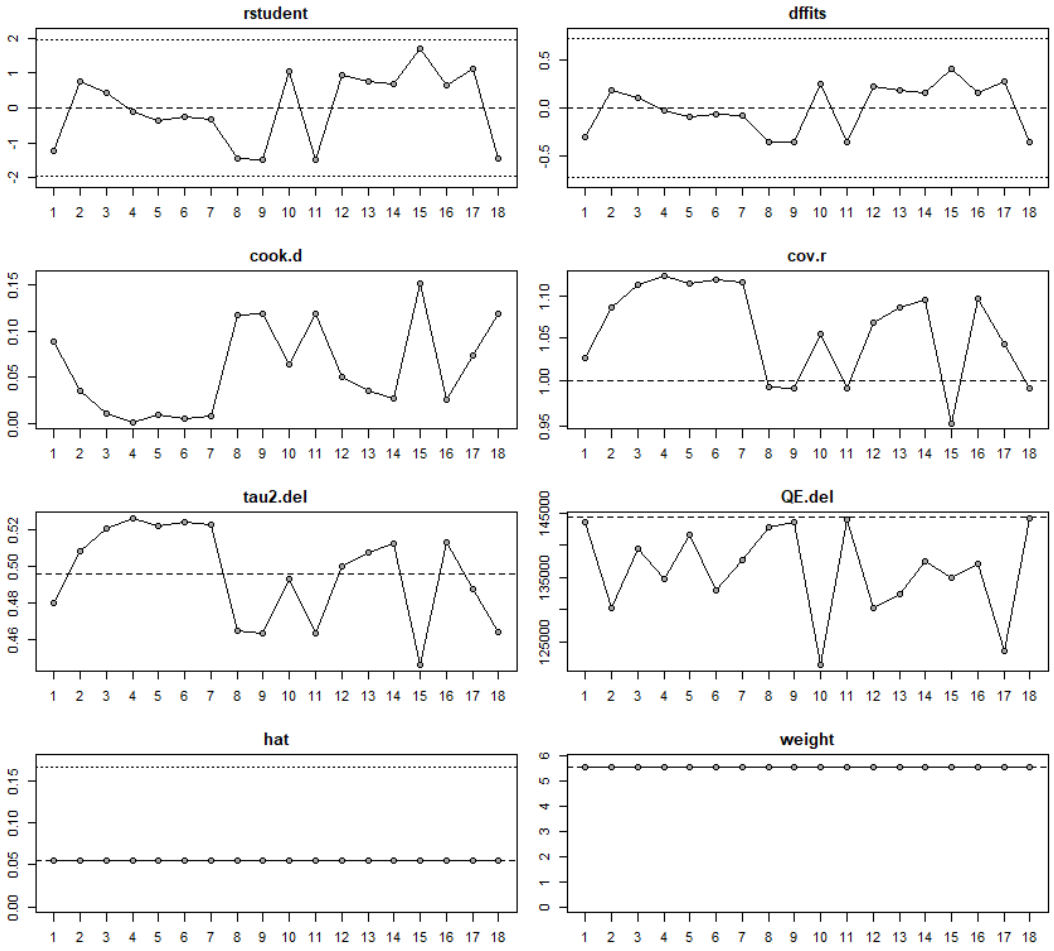
Cook's Distance: Several studies showed unusually high Cook's distances, signaling their substantial impact on the meta-analysis's combined results. The

removal of these studies from the analysis would lead to considerable changes in the meta-analysis outcomes, underscoring their pivotal roles and influence on the study conclusions.

Tau² Delta (tau2.del) and QE Delta (QE.del): Variability in these measures when excluding certain studies suggests that these datasets contribute significantly to the observed heterogeneity in effect sizes across the pooled data. This finding highlights the diverse influences embedded within the individual studies.

Covariance Ratio (cov.r): Changes in this metric when studies were excluded demonstrate that specific studies carry significant weight and markedly affect the precision of the overall meta-analysis findings.

Leverage (hat) and Weight measures did not single out any study as overly dominant, which suggests a well-distributed influence across the included studies, providing a balanced view within the analysis.



The sensitivity analysis underscores the robustness of the meta-analysis results while highlighting the influence of a subset of studies that exhibit substantial statistical leverage or deviate significantly from the norm. These results stress the need for a cautious approach when interpreting the meta-analysis findings. Further scrutiny is recommended to be applied to these influential studies to ensure the integrity and robustness of the conclusions drawn from the meta-analysis. This careful consideration will help mitigate potential biases introduced by the significant sway of particular studies and ensure that this research's policy recommendations and theoretical implications are sound and reliable.

4.4 Subgroup analysis

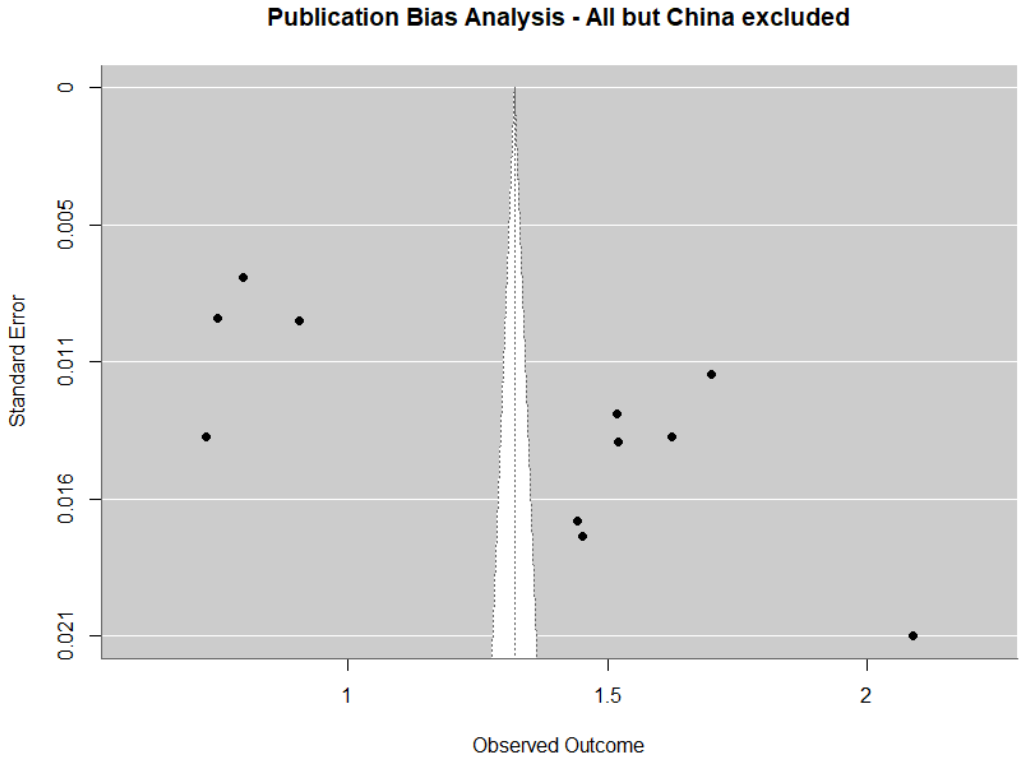
The subgroup analysis aimed to distinguish the effects of herding in different geographical regions, particularly isolating China from the rest of the Asian markets. This distinction was motivated by previous sensitivity analyses that indicated some studies, particularly those from China, disproportionately impacted the overall meta-analysis results.

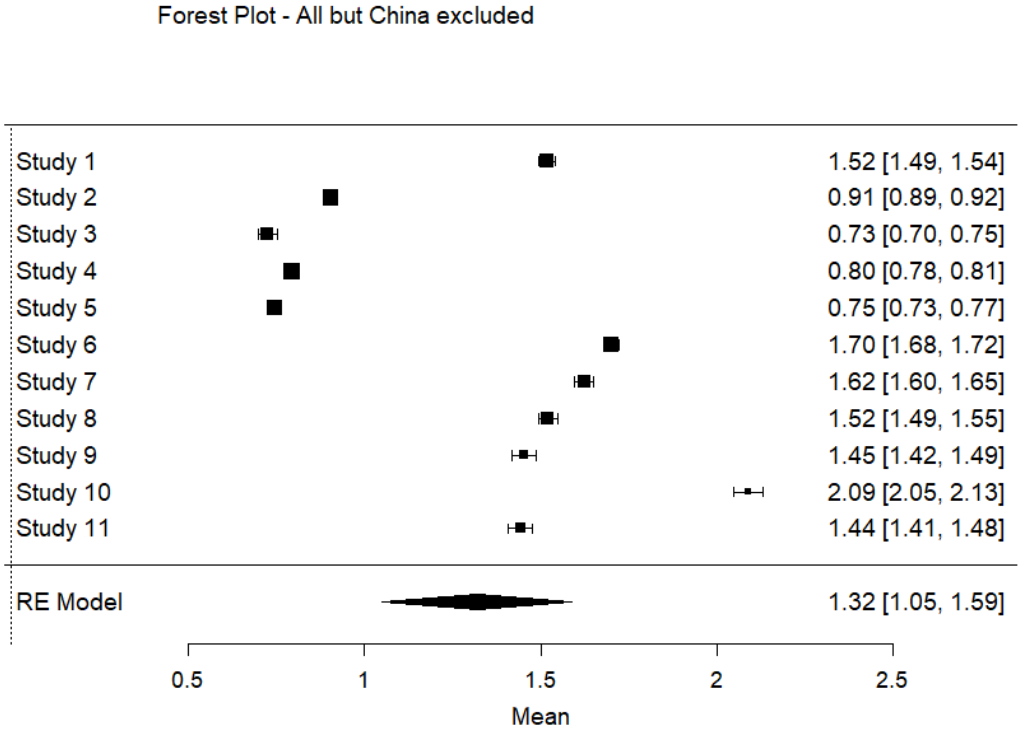
4.4.1 All Excluded but China

Conversely, the analysis focusing solely on Chinese studies presented an even stronger effect of herding behavior. The effect size was markedly higher at 1.3202 with a standard error of 0.1369, statistically significant with a p-value less than 0.0001. This strong effect is further supported by a confidence interval from 1.0519 to 1.5886, indicating robust herding behavior in Chinese markets.

Similar to the previous subgroup, the heterogeneity metrics were elevated:

- **Tau²**: 0.2060 (SE = 0.0922), suggesting significant heterogeneity.
- **I²**: 99.93%, nearly all variability in effect sizes was due to genuine differences between studies.
- **H²**: 1475.62, reflecting substantial variability that extends far beyond mere sampling errors





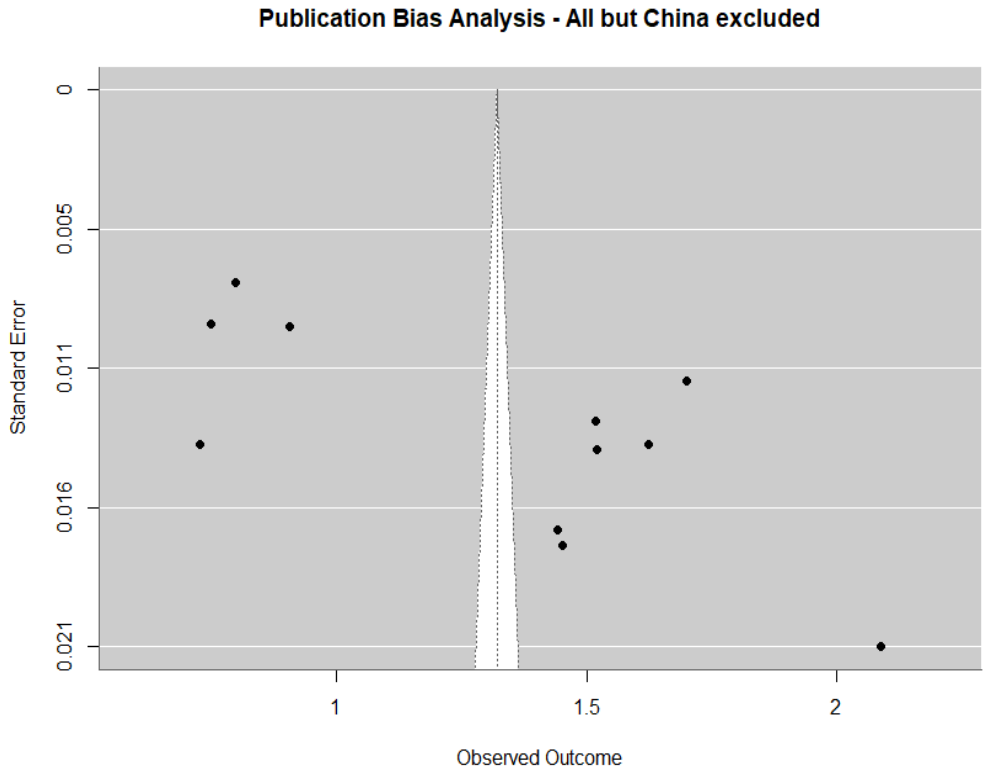
4.4.2 Excluding China

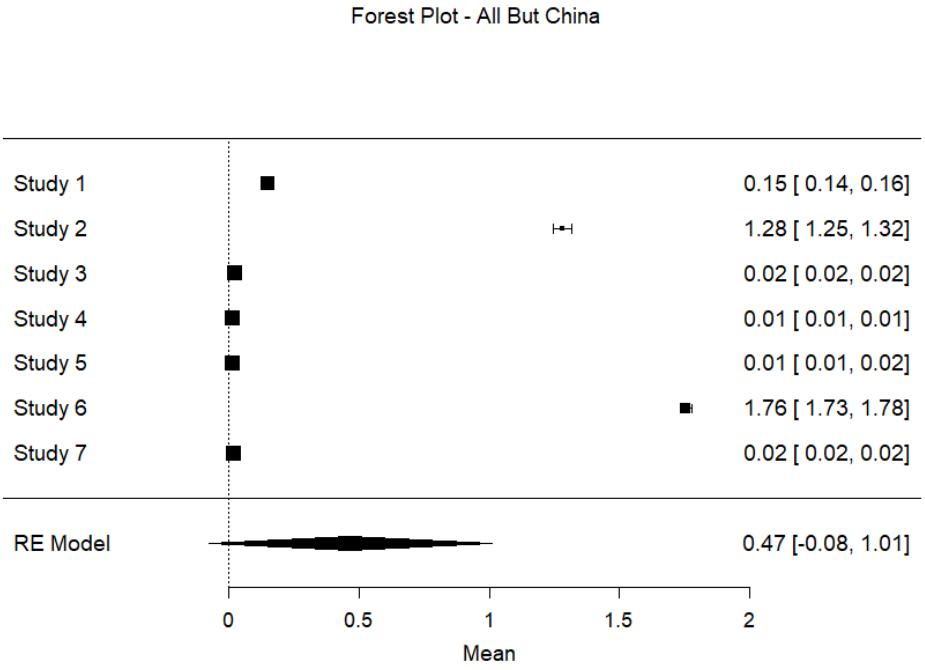
The subgroup analysis that excluded Chinese data and focused on other Asian markets revealed significant variability and a moderate aggregate effect size. The

calculated effect size for this group was 0.4652, with a standard error of 0.2775, indicating a non-significant p-value of 0.0937. Despite the non-significance, this finding suggests a moderate presence of herding behavior, with the confidence interval ranging from -0.0787 to 1.0091.

The heterogeneity measures were notably high:

- **Tau²**: 0.5390 (SE = 0.3112), indicating substantial variation among the study effects.
- **I²**: 100.00%, suggesting that almost all observed variability is due to true differences in effect sizes rather than sampling error.
- **H²**: 18846340.28, an extraordinarily high value, underscoring significant discrepancies in study outcomes beyond what could be attributed to random variation alone.





4.4.3 Implications of Subgroup Analyses

The subgroup analyses underline the importance of regional influences on herding behavior in stock markets. The results suggest that Chinese markets might exhibit more homogeneous herding behavior compared to other Asian countries, where economic and market diversity introduces more variability in investor behavior. These insights are crucial for understanding regional differences in market dynamics and can influence investment strategies and regulatory policies tailored to specific market characteristics.

This detailed breakdown not only addresses the influence of regional discrepancies on herding behavior but also validates the robustness of your meta-analysis by demonstrating how regional separations can affect the synthesis of herding measures across diverse studies.

This section of the thesis delves into the implications of the meta-analysis results, highlighting how they contribute to our understanding of herding behavior in Asian stock markets, particularly during periods of financial crises compared to normal market conditions. The findings illuminate significant nuances in investor behaviors and offer insights that challenge and extend prevailing financial theories.

5.0 Discussion

5.1 Interpretation of Findings

5.1.1 Contextualizing the Results

This meta-analysis significantly advances our understanding of herding behavior in Asian financial markets under diverse conditions. While it highlights an expected increase in herding during financial crises, it notably extends this understanding to include normal market conditions. This broad perspective is critical, as it challenges traditional financial theories like the Efficient Market Hypothesis (EMH), which asserts that markets are efficient and reflect all available information due to the independent actions of well-informed investors (Fama, 1970).

The findings demonstrate a consistent presence of herding, irrespective of market stability, introducing a vital dimension to behavioral finance. This suggests that investor behavior is heavily influenced by psychological and social factors alongside economic indicators, a view supported by Shiller (1995), who posits that psychological factors can significantly impact financial decisions. This observation is particularly crucial in different market conditions where herding can amplify market volatility and influence overall market efficiency.

The implications of these results are profound for existing financial theories and models, necessitating adjustments to more accurately incorporate behavioral insights. This knowledge is essential for academics and policymakers and investment strategists who, by understanding the dynamics of herding behaviors, can devise more effective interventions to mitigate associated risks and enhance market stability (Devenow & Welch, 1996).

Statistical Insights

Our analysis integrated data from various studies, offering a comprehensive examination of herding behavior across stable periods and financial crises within Asian markets. The adoption of a random-effects model was crucial, given the expected heterogeneity across the studies, which stemmed from varied market conditions and methodological approaches. This model choice was appropriate as

it effectively accommodates differences across studies, accounting for the inherent diversity in the Asian financial markets.

The restricted maximum likelihood (REML) method was utilized to estimate the model parameters, ensuring the most accurate estimates of between-study variance. This approach provided robust insights into the aggregated effects and individual study variances and highlighted the need for a nuanced interpretation of herding behaviors that consider both external market shocks and normal trading conditions. By providing detailed statistical insights, this meta-analysis supports existing theories and enriches our understanding of the complex dynamics that influence market behaviors in the context of Asian financial markets.

5.1.2 Key Parameters and Their Interpretations

Tau^2 (Tau-squared): This parameter estimated the amount of true heterogeneity among the effect sizes at 0.4955 (SE = 0.1700). A high Tau^2 value suggests significant differences in the true effects across studies, indicating variability in herding behavior influenced by different market conditions and methodologies used across the studies.

I^2 (I-squared): The I^2 value reached 100.00%, illustrating that nearly all observed variability is due to genuine differences in study effects rather than random error. This highlights the complexity and diversity of herding dynamics across the sampled markets.

H^2 (H-squared): An extremely high H^2 value of 6118628.09 was noted, underscoring the vast range of effect sizes and the substantial spread of these effects beyond what sampling error alone could explain.

The overall estimated effect size was 0.9877 with a standard error of 0.1659, which was statistically significant ($p < .0001$). The 95% confidence interval ranged from 0.6625 to 1.3130, suggesting a solid presence of herding behavior across the Asian stock markets. This significant finding reinforces that herding behavior is prevalent in these markets, influenced by external market shocks and normal trading conditions.

5.1.3 Visualizations

Forest Plot: This plot offers a visual summary of the effect sizes and confidence intervals from each study included in the meta-analysis. By displaying individual study results alongside their aggregate impact, the Forest Plot emphasizes the weight and contribution of each study, allowing for a clear comparison and contrast among the different studies. This visualization highlights the variability and commonalities among the effect sizes and aids in visually assessing the consistency across studies, providing an intuitive understanding of where studies align or differ significantly.

Funnel Plot: Employed to evaluate potential publication bias, the funnel plot's symmetry was meticulously scrutinized. In a perfectly unbiased meta-analytic environment, this plot would exhibit a symmetrical funnel shape, indicating that study results are equally likely to fall above or below the average, regardless of their size. Asymmetries in this plot may suggest potential biases, particularly the underreporting or non-publication of smaller studies or those yielding non-significant results. Such biases are critical as they can skew the meta-analysis towards more favorable outcomes, thereby misleading conclusions about the effects being studied.

These visualizations enhance transparency and provide empirical evidence of the meta-analysis processes. They serve not only to validate the methodological rigor but also to illustrate complex statistical concepts in an accessible format. By doing so, they extend the theoretical understanding of financial market dynamics and offer practical insights for market participants and policymakers. The clear depiction of study impacts and biases fosters a deeper comprehension of herding behavior in Asian financial markets, emphasizing the need to consider behavioral factors in economic models to better predict and manage market behaviors and stability.

5.1.4 Unpacking the High H^2 Value

During our meta-analysis of herding behavior across Asian financial markets, a notably high H^2 value emerged as a pivotal finding. The staggering value of 6118628.09 underscores a profound range of effect sizes, highlighting significant

disparities beyond what could be anticipated from sampling error alone. This section delves into the factors contributing to this high H^2 value and discusses its broader implications for understanding market dynamics.

Understanding H^2 Value

H^2, or the ratio of total variance to within-study variance, quantifies heterogeneity among the effect sizes within a meta-analysis. An H^2 value substantially above 1 suggests pronounced variability across studies, indicative of substantial differences in the underlying phenomena being studied. In our context, such a high H^2 value suggests marked variations in herding behavior that are influenced by diverse market conditions and investor behaviors across different Asian financial markets.

The studies in the meta-analysis span from stable periods to financial crises, with herding behavior intensifying during market downturns as investors are more likely to follow the crowd. This variation contributes significantly to the observed range of effect sizes. Another factor could be that the Asian financial markets are diverse, with varying regulatory maturity and market development degrees. This diversity impacts investor behavior and, consequently, the observed herding behavior.

Insights from Subgroup Analyses

Excluding China - When analyses were conducted without Chinese market data, the H^2 value decreased but remained significantly high. This suggests that while the inclusion of Chinese data adds to the heterogeneity, other markets independently contribute substantial variability.

Including Only Non-Chinese Markets - Conversely, excluding China highlighted significant disparities in remaining markets, particularly with pronounced effect sizes and low standard errors in Indian studies, suggesting notable differences in herding dynamics compared to other regions.

Implications for Market Analysis

The substantial H^2 value challenges us to consider market-specific behaviors and suggests broad generalizations may obscure the nuanced dynamics specific to each market. It calls for tailored analytical approaches to understand and manage market behaviors effectively in differing Asian contexts.

Understanding the implications of high heterogeneity is crucial for policymakers and market analysts. It suggests that interventions to manage market stability and investor behavior need to be customized to specific market conditions and characteristics, potentially leading to more effective regulation and oversight.

While the high H^2 value complicates the drawing of broad generalizations, it opens pathways for more detailed and context-specific investigations into herding behavior across Asian financial markets. This enhanced understanding is vital for developing theories and strategies that accommodate the complexities of these markets, ultimately enriching both academic knowledge and practical financial strategies.

5.2 Relevance to Theoretical Frameworks

Testing the Efficient Market Hypothesis (EMH)

The EMH asserts that stock prices reflect all available information, suggesting that there should be little to no herding since each investor reacts rationally to price signals rather than the actions of others. The herding patterns observed in the meta-analysis challenge this assumption, particularly during market stress. By demonstrating instances where market prices are driven by investor behavior rather than fundamental information, the research questions the completeness of EMH in real-world scenarios, particularly in less mature markets.

Supporting Behavioral Models

Behavioral finance introduces psychology-based theories to explain why and how markets might be inefficient. Herding behavior is a key aspect of behavioral finance, illustrating how psychological and social factors influence investment decisions, leading to potential anomalies in market pricing. The meta-analysis provides empirical backing for behavioral models, showing that herding is

prevalent across various market conditions and more pronounced in periods of uncertainty and crisis.

Understanding Informational Influences

Information cascade theory suggests that it can be rational for individuals to base their decisions on the actions of others, especially when their own information is ambiguous or less reliable. The meta-analysis highlights scenarios where investors in Asian markets potentially engage in information cascades, disregarding their private signals in favor of market trends, which can exacerbate the effects of herding.

By systematically reviewing and analyzing herding behavior across diverse conditions and markets, this meta-analysis provides empirical evidence that challenges traditional financial theories like the EMH and supports newer, behaviorally-oriented theories. The findings suggest that theoretical frameworks need to be dynamic and adaptable to incorporate behavioral biases and market anomalies, offering a more comprehensive understanding of market behaviors, especially in the diverse and rapidly evolving Asian financial landscapes. This relevance to theoretical frameworks underscores the importance of integrating behavioral insights into the models that seek to describe and predict market phenomena, thereby enhancing the robustness and applicability of financial theories in real-world scenarios.

Practical Implications

For policymakers and regulators, understanding herding behavior helps identify when and how market anomalies might occur, particularly during turbulent periods. This knowledge can guide the development of targeted regulatory policies to prevent market manipulation and enhance transparency. For instance, implementing stricter disclosure requirements during volatile periods could mitigate herding by improving the availability and quality of information. The findings suggest that herding behavior intensifies during financial crises. Regulatory bodies can use these insights to prepare more effective crisis management strategies, such as temporary trading halts or adjustments to margin requirements, to dampen herding impulses and stabilize markets.

When it comes to investors and financial strategists, they often follow the crowd in times of uncertainty, which can lead to suboptimal investment decisions. By understanding the triggers and effects of herding behavior, investors can better manage their risk exposure, especially in volatile markets. Recognizing the signs of herding may prompt more cautious investment decisions and encourage contrarian strategies when appropriate. The study also underscores the importance of diversification, not just across asset classes but also geographically. Investors might consider diversifying their investments to include markets or sectors less prone to herding behavior, potentially reducing their investment returns' volatility.

5.3 Comparison with Existing Literature

This research engages extensively with the existing empirical and theoretical frameworks on herding behavior in financial markets, specifically within the context of Asian economies. By juxtaposing the findings of this meta-analysis against prior studies, we can discern corroborative evidence and new insights that extend our understanding of market dynamics.

5.3.1 Theoretical and Practical Implications

The findings of our meta-analysis resonate strongly with theoretical predictions concerning herding behavior in financial markets, particularly under conditions of market volatility. Classical literature by Shiller and Devenow and Welch has consistently highlighted the influence of psychological biases and market sentiment on investor behavior, theorizing that investors are prone to mimic the decisions of others during uncertain times (Shiller, 1995) (Devenow & Welch, 1996). Our study underscores these observations, showing a marked increase in herding behavior during significant market disruptions, such as the Asian Financial Crisis and the 2008 Global Financial Crisis.

Moreover, the theories posited by Bikhchandani and Sharma, which discuss the dynamics of herd behavior in financial markets, align with our findings that investors tend to follow crowd behavior rather than independent analysis during periods of high uncertainty (Bikhchandani & Sharma, 2000). Hirshleifer and Teoh provide a synthesis on how such cascading behaviors can compound, leading to market inefficiencies—a pattern our meta-analysis robustly supports by

demonstrating how widespread herding can intensify during tumultuous periods (Hirshleifer & Hong Teoh, 2003).

Additionally, the empirical evidence provided by Chiang and Zheng on herding behavior across global stock markets complements our results, offering a broader validation of herding phenomena as a pervasive element influencing market dynamics during crises . These studies collectively reinforce the theoretical framework suggesting that herding is not merely a sporadic anomaly but a fundamental aspect of investor behavior that significantly affects market efficiency and stability (Chiang & Zheng, 2010).

This alignment with established financial theories validates the methodologies employed in our meta-analysis. It enhances the theoretical underpinnings of behavioral finance, suggesting that current models of market behavior may need to be revised to fully integrate the implications of investor psychology and collective behavior dynamics.

5.4 Methodological Enhancements

Our meta-analysis represents a significant methodological advancement in the study of herding behavior within financial markets, particularly those in Asia. By integrating data from multiple studies, we have not only enhanced the statistical power of our analysis but also addressed some of the limitations inherent in individual studies. This approach has allowed for a more nuanced understanding of the dynamics of herding behavior across different market conditions and periods.

One of the key methodological enhancements in this study is the sophisticated aggregation of data across diverse market scenarios. This was achieved by employing a random-effects model, which is particularly suited to handling variability among study outcomes that differ in terms of sample sizes, methodologies, and geographic and economic contexts. This model assumes that the studies included in the meta-analysis are drawn from populations of studies that systematically differ, allowing for more generalizable inferences across heterogeneous conditions. The use of restricted maximum likelihood (REML) for estimating between-study variance represents an advanced statistical approach that improves the accuracy and reliability of the meta-analysis results. REML is

advantageous because it reduces bias in the estimation of variance components, thereby providing a more accurate measure of the true effects of herding across studies. This technique is particularly crucial in finance, where outlier data and market anomalies can influence effect sizes.

To ensure the robustness of our findings, we conducted detailed sensitivity and subgroup analyses. These analyses helped identify the influence of individual studies on the overall meta-analysis and assess the consistency of the results across different subgroups. By systematically excluding studies that disproportionately affected the meta-analysis outcomes, we were able to determine the stability of our findings and explore underlying reasons for heterogeneity. This careful examination through sensitivity analysis underscores our commitment to methodological rigor and transparency. It also highlights how certain studies or data points might disproportionately influence the overall results, ensuring that conclusions drawn are based on a balanced view of the available evidence. We also employed funnel plots to assess publication bias, a common concern in meta-analyses where the non-publication of studies with non-significant or negative results can skew findings. This methodological enhancement helps in visualizing asymmetry in study results that might indicate publication bias, providing a critical check on the integrity of the aggregated data.

The methodological enhancements described here not only strengthen the findings of this study but also contribute to the broader discourse on herding behavior in Asian stock markets. By addressing both statistical and practical concerns, this meta-analysis sets a new benchmark for future research in behavioral finance, offering methodologically sound and practically relevant insights. These enhancements make our research robust and give it a methodological edge, demonstrating a comprehensive approach to understanding herding behavior in financial markets.

5.4.1 Divergences and Unique Contributions

This meta-analysis offers distinct perspectives and extends the existing body of knowledge on herding behavior in financial markets by focusing specifically on Asian markets. Unlike many studies centered on Western financial systems, our

research contributes nuanced insights into the dynamics of Asian financial markets, which display unique regulatory, cultural, and economic characteristics.

In addressing the gap left by the predominant focus on Western markets in existing herding behavior literature, (Choi & Sias, 2009), our study sheds light on the complex investor behaviors in Asian markets. These markets are significantly influenced by local regulatory policies and investor sentiments that differ markedly from those in the U.S. and Europe, providing a rich context for exploring behavioral finance phenomena. While not claiming methodological superiority, our study employs advanced meta-analytical techniques, including the random-effects model with REML estimation. This approach allows for a more nuanced handling of the inherent heterogeneity across the compiled studies. By doing so, it enhances the reliability of our findings and provides a careful examination of the varied effects within our dataset.

Our research contributes to the field by emphasizing the specificities of Asian markets within the broader herding behavior discourse. By focusing on these markets, we aim to provide insights that are directly applicable to investors, policymakers, and academics interested in the regional differences in financial market behavior. The findings suggest a nuanced understanding of herding dynamics, reinforcing the notion that investor behavior in Asian markets can occasionally deviate from the predictions of classical financial theories due to unique market and cultural factors.

5.5 Strengths and Limitations of the Study

5.5.1 Strengths of the Study

One of the principal strengths of this thesis lies in its focus on Asian financial markets—a region that is often overlooked in much of the behavioral finance literature. By concentrating on this diverse and dynamic area, the study provides pivotal insights into the behaviors and trends within markets at different economic and regulatory development stages. Understanding regional characteristics is crucial for global market analysis, as it helps in identifying unique investment opportunities and risks. This geographic specificity enriches the study's

applicability to a wider range of financial phenomena and enhances our understanding of how regional factors influence investor behaviors.

The use of meta-analytical techniques is another significant strength of this research. Meta-analysis allows for a robust aggregation of findings from multiple studies, offering a more nuanced understanding of complex phenomena like herding behavior. By integrating diverse findings, this approach helps overcome the limitations of individual studies, particularly those related to sample size and regional focus. Adopting a random-effects model is particularly apt given the heterogeneity of the included studies concerning their market conditions, time periods, and methodologies. Borenstein et al. (2010) emphasize that random-effects models are more appropriate than fixed-effects models in situations where the studies are expected to have real differences in effect sizes due to variable experimental conditions.

This study's meticulous approach to evaluating and correcting for publication bias further bolsters its scientific integrity. Employing tools such as funnel plots and sensitivity analyses addresses a critical issue in meta-analysis, ensuring that the conclusions drawn are not biased towards published, predominantly positive findings. According to Egger, the careful assessment of publication bias is essential for providing a transparent and comprehensive overview of available evidence, which in turn increases the reliability of the research outcomes (Egger et al., 1997)This approach not only strengthens the conclusions of this thesis but also sets a high standard for future meta-analyses in the field.

5.5.2 Limitations of the Study

A notable limitation of this thesis is the constrained number of studies included in the meta-analysis. While meta-analysis is renowned for its ability to synthesize disparate research findings, the robustness of its conclusions is heavily dependent on the volume of data it aggregates. According to Valentine, the effectiveness of meta-analytical conclusions can be significantly diminished by a small data pool, which may lead to an overestimation of effect size consistency and generalizability (Valentine et al., 2010). This limitation is particularly pronounced in our study, where only a handful of studies were analyzed, thereby increasing the risk of drawing overly confident conclusions from an insufficiently broad evidence base.

Given the limited number of studies, there is a consequential risk of overgeneralizing the findings. This study's results indicate herding behaviors within Asian financial markets; however, they might not comprehensively represent all market nuances or accommodate outlier behaviors that could be observed in a more extensive dataset. Ioannidis, warns that small studies in meta-analyses are often not only less precise but also tend to overestimate effect sizes, which can mislead policy formulation and academic understanding (Ioannidis, 2005)

The included studies vary significantly in their methodological rigor, which impacts the overall quality and reliability of the synthesis. Efforts were made to mitigate this issue through rigorous selection and analytical controls; however, as Higgins and Green (2009) outline, intrinsic differences in study designs, sample sizes, and analysis methods can introduce biases that are challenging to thoroughly neutralize. This variability can skew the meta-analysis results, making it difficult to form a definitive conclusion about herding behavior across all studies (J. Higgins & Green, 2009)

The focus on Asian markets, while beneficial for regional specificity, introduces challenges associated with the heterogeneity of economic conditions, regulatory frameworks, and market maturity across different Asian countries. As Chan (2008) discuss, these variations can significantly affect investor behavior, potentially leading to inconsistent herding dynamics across different settings (Chan et al., 2008) . While enriching the study’s contextual scope, this geographical diversity complicates the task of drawing generalized conclusions applicable to all Asian markets.

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7.0 Appendices

7.1 Articles business source complete

Business Source complete											
Title	**Author**	**Published**	**Limiters**	**Date**	**CSAD**	**Sample period**	**Sample period include financial crises?**	**Increased herding behavior during crises?**	**Include/Exclude in analysis**	**Comment**	**Country**
Do investors herd? An examination of Pakistan stock exchange	Muhammad Kashif | Rana Palwishah | Rizwan Raheem Ahmed | Jolita Vveinhardt | Dalia Streimikiene	April 2021	Full text, Peer reviewed, 2010-2024	12.04.2024	No	2000-2016	Yes	Yes	No		Pakistan
Existence of Herding Behaviour in the Indian Stock Market: An Empirical Analysis During the COVID-19 Period	Ved Prakash1*, K. Padmasree1 and Sarwdaman Kashyap2	March 2024	Full text, Peer reviewed, 2010-2024	12.04.2024	Mean: 9,5382 Min:0,25 Max: 2804,74	2011-2020	Yes	Yes	No		India
Herding behavior in the Chinese stock market and the impact of COVID-19	Maquieira, C; Espinosa-Méndez, C	December 2022	Full text, Peer reviewed, 2010-2024	12.04.2024	No	2001-2020	Yes	Yes	No		China
Herding Behavior and Market Conditions: Empirical Evidence from Bombay Stock Exchange, India	Goel, Payal	October 2019	Full text, Peer reviewed, 2010-2024	12.04.2024	Mean: 0,149796 Min: 0,066409 Max: 0,722601	2000-1018	Yes	Yes	Include		India
Exploring herding behavior in an innovative-oriented stock market: evidence from ChiNext	Sin-Huei Ng a , Zhehan Zhuangb , Moau-Yong Toha , Tze-San Ongc and BoonHeng Teh	March 2022	Full text, Peer reviewed, 2010-2024	12.04.2024	Mean: 1,5178 Min: 0,6778 Max: 4,2507	2015-2019	Yes	Yes	Include	More herd behavir during declining market	China
Herd Behavior in Indian Stock Market During Extreme Volatility and Covid-19 Pandemic.	Warne, D. P. | Saini, Suman	July 2022	Full text, Peer reviewed, 2010-2024	12.04.2024	Mean: 1,281852 Min: 0,534170 Max: 4,96815	2019-2021	Yes	Yes	Include	More herd behavoior during the beginning of the crises	India
Time-Varying Herding Behavior, Global Financial Crisis, and the Chinese Stock Market	Sharma, Susan Sunila | Narayan, Paresh | Thuraisamy, Kannan	June 2015	Full text, Peer reviewed, 2010-2024	12.04.2024		2007-2010	Yes	No			China
				Shanghai Stock Exchange A	Mean: 0,9068 Min: 0,3616 Max: 2,8124						
				Shanghai Stock Exchange B	Mean: 0,7266 Min: 0,2398 Max: 4,1871				Include	Less herding in financial crises	
				Shenzhen Stock Exchange A	Mean: 0,7974 Min: 0,2916 Max: 2,2029						
				Shenzhen Stock Exchange B	Mean: 0,7478 Min: 0,3045 Max: 2,8181						

Effects of Transparency on Herding Behavior: Evidence from the Taiwanese Stock Market	Huang, Yu-Sin | Wang, Kuei-Yuan	2019	Full text, Peer reviewed, 2010-2024	12.04.2024	No	2003-2014	Yes	Yes	No		Taiwan
Herding in frontier stock markets: evidence from the Vietnamese stock market	Bui, Nha Duc | Nguyen, Loan Thi Bich | Nguyen, Nhung Thi Tuyet | Titman, Gordon Frederick | Smith, Tom	November 2018	Full text, Peer reviewed, 2010-2024	12.04.2024	Mean: 0,0231 Min: 0,05 Max: 0,005	2000-1015	Yes	Yes	Include		Vietnam
Herding Behavior in Chinese Stock Markets during COVID-19	Wu, Guosong | Yang, Boxian | Zhao, Ningru	2020	Full text, Peer reviewed, 2010-2024	12.04.2024	No				No		China
An Assessment of the Mimicking Tendency of Investors in an Indian Benchmark Index	G., Naresh | R., Ganesh | S., Thiyagarajan	June 2019	Full text, Peer reviewed, 2010-2024	12.04.2024	Mean: 0,014 Min: 0,004 Max: 0,064	2005-2015	Yes	Yes	Include		India
What Explains Herd Behavior in the Chinese Stock Market	Chong, Terence Tai-Leung | Liu, Xiaojin | Zhu, Chenqi	December 2017	Full text, Peer reviewed, 2010-2024	12.04.2024	Mean: 1,7 Min: 0,4 Max: 6,0	2000-2011	Yes	Yes	Include		China
Investors' Fear and Herding Behavior: Evidence from the Taiwan Stock Market	Huang, Teng-Ching | Wang, Kuei-Yuan	2017	Full text, Peer reviewed, 2010-2024	12.04.2024	Mean: 0,015 Min: 0,008 Max: 0,035	2005-2010	Yes	Yes	Include		Taiwan
Does The Liquidity of Market Lead to Herding	ÇELİK, Sibel | DENİZ KOÇ, Yasemin	2019	Full text, Peer reviewed, 2010-2024	12.04.2024	Mean: 0,0172 Min: 0,0 Max: 0,0766	2005-2018	Yes		No	Not in English	Turkey
Herding behaviour in asymmetric and extreme situations: the case of China	Luo, Ziyao | Schinckus, Christophe	July 2015	Full text, Peer reviewed, 2010-2024	12.04.2024	No	2006-2012	Yes		No		China
Time-Varying Investor Herding in Chinese Stock Markets	Li, Haiqi | Liu, Ying | Park, Sung Y.	December 2018	Full text, Peer reviewed, 2010-2024	12.04.2024	Mean: 1,6233 Min: 0,5465 Max: 5,6143	2006-1015	Yes	Yes	Include		China
Oil speculation and herding behavior in emerging stock markets	Cakan, Esin | Demirer, Riza | Gupta, Rangan | Marfatia, Hardik A.	January 2019	Full text, Peer reviewed, 2010-2024	12.04.2024	No	2006-2015	Yes		No		Russia/Turkey/Brazil
Industry herding and market states evidence from Chinese stock markets	Lee, Chien-Chiang | Chen, Mei-Ping | Hsieh, Kuan-Mien	July 2013	Full text, Peer reviewed, 2010-2024	12.04.2024	Mean: 1,521 Min: 0,0 Max: 7,662	2001-2011	Yess	Yes	Include	Big differnce in different industries	China
The Response of Dynamic Herd Behavior to Domestic and U.S. Market Factors: Evidence from the Greater China Stock Markets	Yang, Wan-Ru | Chen, Yi-Ling	2015	Full text, Peer reviewed, 2010-2024	12.04.2024		2005-2009	Yes	Yes	Include	Excluded US from the data analysis	
				Hong Kong	Mean: 1,4524 Min: 0,5442 Max: 7,1503						China
				Shanghai A-Share	Mean: 2,0887 Min: 0,8253 Max: 7,1313						China
				Shanghai B-Share	Mean: 1,4427 Min: 0,5076 Max: 5,4042						China
				Taiwan	Mean: 1,7561 Min: 0,5903 Max: 4,0776						Taiwan

Empirical Investigation of the Causal Relationships Among Herding, Stock Market Returns, and Illiquidity: Evidence from Major Asian Markets	Qiao, Zhuo | Chiang, Thomas C. | Tan, Lin	41883	Full text, Peer reviewed, 2010-2024	12.04.2024					No	Can not get access	

7.2 Articles Web of Science

Web Of Science											
Title	Author	Published	Limiters	Date	CSAD	Sample period	Sample period include financial crises?	Increased herding behavior during crises?	Include/Exclude in analysis	Comment	Country
Analyzing The Relationship Between Return and Trading Volume in Relation to Cross-Sectional Absolute Deviation (CSAD) In Order to Detect Herding Behavior in Indonesia Emerging Stock Market	Malini, H | Sakliana, AD	July 2022	Open Access, Peer reviewed, 2010-2024	12.04.2024	Yes	2016-2021	Yes		No	Does not include neccecary data	Indonesia
Do investors herd with industries or markets? Evidence from Pakistan stock exchange	Akbar, US | Rajput, SKO | Bhutto, NA	December 2019	Open Access, Peer reviewed, 2010-2024	12.04.2024	Yes	2000-2014	Yes		No	Does not include neccecary data	Pakistan
Empirical Analysis of Herd Behavior in Pakistan Stock Exchange	Ahmed, F | Karira, D	January 2019	Open Access, Peer reviewed, 2010-2024	12.04.2024	Yes	2009-2017	No		No	Does not include neccecary data	Pakistan
Herd Behaviour, Fundamental, and Macroeconomic Variables - The Driving Forces of Stock Returns: A Panel-Based Pooled Mean Group Approach	Jabeen, S | Rizavi, SS | Farhan, M	March 2022	Open Access, Peer reviewed, 2010-2024	12.04.2024	Yes	1999-2017	Yes		No	Does not include neccecary data	Pakistan
The effect of herd formation among healthcare investors on health sector growth in China	Zhou, LL | Antwi, HA | Wang, WX | Yiranbon, E | Marfo, EO | Acheampong, P	July 2016	Open Access, Peer reviewed, 2010-2024	12.04.2024	No	2004-2014	Yes		No	Does not include neccecary data	China
Exploring herding behavior in an innovative-oriented stock market: evidence from ChiNext	Ng, Sin-Huei | Zhuang, Zhehan | Toh, Moau-Yong | Ong, Tze-San | Teh, Boon-Heng	March 2022	Open Access, Peer reviewed, 2010-2024	12.04.2024	Mean: 1,5178 Min: 0,6778 Max: 4,2507	2015-2019	Yes	Yes	Include	More herd behavir during declining market	China

COVID-19 pandemic and herd behavior: Evidence from a frontier market	Nguyen, Huu Manh | Bakry, Walid | Vuong, Thi Huong Giang	June 2023	Open Access, Peer reviewed, 2010-2024	12.04.2024	No	2016-2022	Yes		No	Does not include nececary data	Vietnam
Herding Behavior in Emerging and Frontier Stock Markets During Pandemic Influenza Panics	Quang Thu Luu | Hien Thi Thu Luong	September 2020	Open Access, Peer reviewed, 2010-2024	12.04.2024	No	2000-2024	Yes		No	Does not include nececary data	Vietnam
Herding behavior and government policy responses: Evidence from COVID-19 effect	Nouri-Goushki, Mohadese | Hojaji, S. Navid	July 2023	Open Access, Peer reviewed, 2010-2024	12.04.2024	Mean: 0,0173 Min: 0,0013 Max: 0,0855	2012-2022	Yes	Yes	Include		Iran
Chinese stock market volatility and herding behavior asymmetry during the COVID-19 pandemic	Fei, Fan | Zhang, Jianing	December 2023	Open Access, Peer reviewed, 2010-2024	12.04.2024	Yes	2019-2021	Yes		No	Does not include nececary data	China
The Effect of COVID-19 on Herding Behavior in Eastern European Stock Markets	Fang, Hao | Chung, Chien-Ping | Lee, Yen-Hsien | Yang, Xiaohan	July 2021	Open Access, Peer reviewed, 2010-2024	12.04.2024						Not Asia	

7.3 Articles Science Direct

Title	Author	Published	Limiters	Date	CSAD	Sample period	Sample period include financial crises?	Increased herding behavior during crises?	Include/Exclude in analysis	Comment	Country
Herding behaviour in digital currency markets: An integrated survey and empirical estimation	Nikolaos A. Kyriazis	August 2020	Open Access, Peer reviewed, 2010-2024	12.04.2024		2017-2018	No		No	Not relevant market	Global
Herding during different types of crises: The COVID-19 health crisis and Russia–Ukraine political crisis	Ruqayya Aljifri	May 2024	Open Access, Peer reviewed, 2010-2024	12.04.2024		2009-2024	Yes	Yes	No	Not in Asia	
Herding behaviour and monetary policy: Evidence from the ZAR market	Xolani Sibande	June 2024	Open Access, Peer reviewed, 2010-2024	12.04.2024		2000-2022	Yes		No		South Africa
Herding behavior and government policy responses: Evidence from COVID-19 effect	Mohadese Nouri-Goushki | S. Navid Hojaji	July 2023	Open Access, Peer reviewed, 2010-2024	12.04.2024	Mean: 0,0173 Min: 0,0013 Max: 0,0855	2012-2022	Yes	Yes	Include		Iran
Herding in the bad times: The 2008 and COVID-19 crises	Sandra Ferreruela | Tania Mallor	November 2023	Open Access, Peer reviewed, 2010-2024	12.04.2024		2000-2021	Yes	No	No	Not in Asia	Spain and Portugal

Do clean and dirty cryptocurrency markets herd differently?	Boru Ren | Brian Lucey	June 2023	Open Access, Peer reviewed, 2010-2024	12.04.2024				No	Not relevant market
Can China's cross-sectional dispersion of stock returns influence the herding behaviour of traders in other local markets and China's trading partners?	Oiping Chong | Bany-Ariffin A.N. | Bolaji Tunde Matemilola | C.B. McGowan Jr.	March 2020	Open Access, Peer reviewed, 2010-2024	12.04.2024	No			No	Not CSAD
Herding behaviour and sentiment: Evidence in a small European market	Elisabete F. Simões Vieira | Márcia S. Valente Pereira	2013	Open Access, Peer reviewed, 2010-2024	12.04.2024		2003-2011	No	No	Not in Asia
Empirical research of herding behavior in the Pacific Basin stock markets: Evidence from the U.S. stock market rise (drop) in succession	Ta-Li Shih | Ai-Chi Hsu | Shih-Jui Yang | Chien-Chiang Lee	2012	Open Access, Peer reviewed, 2010-2024	12.04.2024		2004-2017		No	Not in Asia
Herding effect in economic sectors of the Latin American stock markets: A pre and post-subprime crisis vision	Juan Benjamín Duarte Duarte | Laura Daniela Garcés Carreño | Katherine Julieth Sierra Suárez	June 2016	Open Access, Peer reviewed, 2010-2025	12.04.2024				No	Not in Asia
The herding behaviour of investors in the CEE stocks markets	Angela Filip | Miruna Pochea | Andreea Pece	2015	Open Access, Peer reviewed, 2010-2026	12.04.2024				No	Not in Asia
Apport de la finance comportementale à l'explication de la volatilité excessive des prix des actifs financiers	Kamel Naoui | Mohamed Khaled	2010	Open Access, Peer reviewed, 2010-2027	12.04.2024				No	Not in Asia

7.4 Overview of chosen data

Overview of chosen data

Title	CSAD	Increased herding behavior during crises?	Country	Mean	Min	Max	SE	Exhange	Observations
Herding Behavior and Market Conditions: Empirical Evidence from Bombay Stock Exchange, India	Mean: 0,149796 Min: 0,066409 Max: 0,722601	Yes	India	0,149796	0,066409	0,722601	0,00485		216
Exploring herding behavior in an innovative-oriented stock market: evidence from ChiNext	Mean: 1.5178 Min: 0,6778 Max: 4,2507	Yes	China	1,5178	0,6778	4,2507	0,0127		1219
Herd Behavior in Indian Stock Market During Extreme Volatility and Covid-19 Pandemic.	Mean: 1,281852 Min: 0,534170 Max: 4,96815	Yes	India	1,281852	0,53417	4,96815	0,01834		741
Time-Varying Herding Behavior, Global Financial Crisis, and the Chinese Stock Market	Mean: 0,9068 Min: 0,3616 Max: 2,8124	Yes	China	0,9068	0,3616	2,8124	0,0091	SHSEA	1060
	Mean: 0,7266 Min: 0,2398 Max: 4,1871			0,7266	0,2398	4,1871	0,0136	SHSEB	1060
	Mean: 0,7974 Min: 0,2916 Max: 2,2029			0,7974	0,2916	2,2029	0,0074	SZSEA	1060
	Mean: 0,7478 Min: 0,3045 Max: 2,8181			0,7478	0,3045	2,8181	0,0090	SZSEB	1060
Herding in frontier stock markets: evidence from the Vietnamese stock market	Mean: 0,0231 Min: 0,005 Max: 0,05	Yes	Vietnam	0,0231	0,005	0,05	0,000183		772
An Assessment of the Mimicking Tendency of Investors in an Indian Benchmark Index	Mean: 0,014 Min: 0,004 Max: 0,064	Yes	India	0,014	0,004	0,064	0,0000996		2510
What Explains Herd Behavior in the Chinese Stock Market	Mean: 1,7 Min: 0,4 Max: 6,0	Yes	China	1,7	0,4	6	0,01116		2901
Investors' Fear and Herding Behavior: Evidence from the Taiwan Stock Market	Mean: 0,015 Min: 0,008 Max: 0,035	Yes	Taiwan	0,015	0,008	0,035	0,00009		1989
Time-Varying Investor Herding in Chinese Stock Markets	Mean: 1,6233 Min: 0,5465 Max: 5,6143	Yes	China	1,6233	0,5465	5,6143	0,0136		2386
Industry herding and market states evidence from Chinese stock markets	Mean: 1,521 Min: 0,0 Max: 7,662	Yes	China	1,521	0	7,662	0,0138		1863
The Response of Dynamic Herd Behavior to Domestic and U.S. Market Factors: Evidence from the Greater China Stock Markets	Mean: 1,4524 Min: 0,5442 Max: 7,1503	Yes	China	1,4524	0,5442	7,1503	0,0175	HK	1234
	Mean: 2,0887 Min: 0,8253 Max: 7,1313		China	2,0887	0,8253	7,1313	0,0214	SHSEA	1215
	Mean: 1,4427 Min: 0,5076 Max: 5,4042		China	1,4427	0,5076	5,4042	0,0169	SHSEB	1215
	Mean: 1,7561 Min: 0,5903 Max: 4,0776		Taiwan	1,7561	0,5903	4,0776	0,0121	TW	1242
Herding behavior and government policy responses: Evidence from COVID-19 effect	Mean: 0,0173 Min: 0,0013 Max: 0,0855	Yes	Iran	0,0173	0,0013	0,0855	0,000141		2381

7.5 Summary of data

Country	Mean	Min	Max	Count (country)
India	0,4819	0,2015	1,9183	3
China	1,3204	0,4272	5,0212	8
Vietnam	0,0231	0,0050	0,0500	1
Taiwan	0,8856	0,2992	2,0563	2
Iran	0,0173	0,0013	0,0855	1
Total				15

7.6 Data input for R analysis

Datainput for R Analysis

Title	Effect size	SE	Country	Observations
Herding Behavior and Market Conditions: Empirical Evidence from Bombay Stock Exchange, India	0,149796	0,00485	India	216
Exploring herding behavior in an innovative-oriented stock market: evidence from ChiNext	1,5178	0,0127	China	1219
Herd Behavior in Indian Stock Market During Extreme Volatility and Covid-19 Pandemic.	1,281852	0,01834	India	741
Time-Varying Herding Behavior, Global Financial Crisis, and the Chinese Stock Market - SHSEA	0,9068	0,0091	China	1060
Time-Varying Herding Behavior, Global Financial Crisis, and the Chinese Stock Market - SHSEB	0,7266	0,0136	China	1060
Time-Varying Herding Behavior, Global Financial Crisis, and the Chinese Stock Market - SZSEA	0,7974	0,0074	China	1060
Time-Varying Herding Behavior, Global Financial Crisis, and the Chinese Stock Market - SZSEB	0,7478	0,0090	China	1060
Herding in frontier stock markets: evidence from the Vietnamese stock market	0,0231	0,000183	Vietnam	772
An Assessment of the Mimicking Tendency of Investors in an Indian Benchmark Index	0,014	0,0000996	India	2510
What Explains Herd Behavior in the Chinese Stock Market	1,7	0,01116	China	2901
Investors' Fear and Herding Behavior: Evidence from the Taiwan Stock Market	0,015	0,00009	Taiwan	1989
Time-Varying Investor Herding in Chinese Stock Markets	1,6233	0,0136	China	2386
Industry herding and market states evidence from Chinese stock markets	1,521	0,0138	China	1863
The Response of Dynamic Herd Behavior to Domestic and U.S. Market Factors: Evidence from the Greater China Stock Markets - HK	1,4524	0,0175	China	1234
The Response of Dynamic Herd Behavior to Domestic and U.S. Market Factors: Evidence from the Greater China Stock Markets - SHSEA	2,0887	0,0214	China	1215
The Response of Dynamic Herd Behavior to Domestic and U.S. Market Factors: Evidence from the Greater China Stock Markets - SHSEB	1,4427	0,0169	China	1215
The Response of Dynamic Herd Behavior to Domestic and U.S. Market Factors: Evidence from the Greater China Stock Markets - tw	1,7561	0,0121	Taiwan	1242
Herding behavior and government policy responses: Evidence from COVID-19 effect	0,0173	0,000141	Iran	2381