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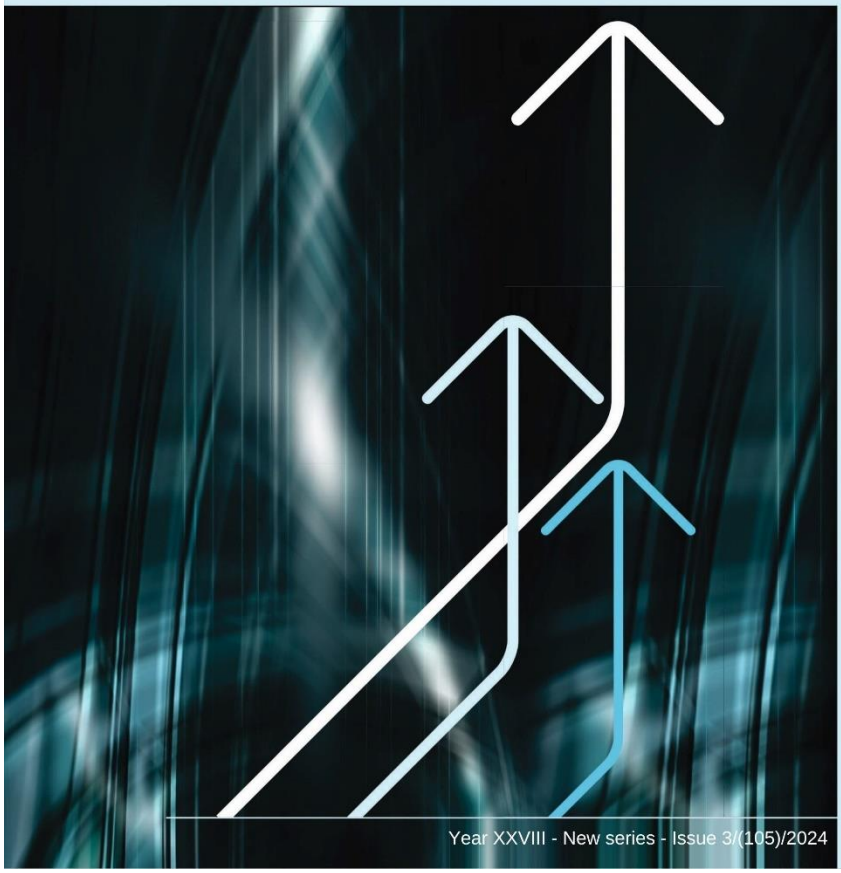

Year XXVIII - New series - Issue 3/(105)/2024

"VICTOR SLĂVESCU" CENTRE FOR FINANCIAL
AND MONETARY RESEARCH

FINANCIAL STUDIES

ROMANIAN ACADEMY
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THE IMPACT OF THE GEORGIAN REAL ESTATE INVESTMENT TRUST ON THE PERFORMANCE OF VARIOUS PORTFOLIOS

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Abstract

This study aims to explore the potential impact of the anticipated Georgian Real Estate Investment Trusts (REITs) on the performance of investment portfolios. Due to the absence of Georgian REITs, a simulated financial asset representing a Georgian Residential REIT was engineered. The study employed correlation analysis, portfolio analysis, Sharpe Ratio evaluation, and Efficient Frontier analysis. Portfolios in the study included various assets such as Georgian Commercial Banks USD Certificates of Deposits, Georgian Treasury Bonds, NASDAQ Index, and the Georgian Pension Fund Global Equity Portfolio. Monthly data from 2021-2023 were used to engineer Georgian REIT and estimate expected returns, volatility, Sharpe ratios, and correlation coefficients. The study concludes that incorporating a Georgian REIT into diversified investment portfolios can significantly enhance their attractiveness by improving the risk-return trade-off. The findings highlight the necessity for Georgian regulators and market participants to consider the introduction of REITs as a viable investment vehicle. Additionally, the research contributes to the limited scholarly literature on REITs' impact in emerging markets, offering a framework for future studies in similar contexts.

Keywords: Emerging financial markets, financial engineering, simulated REIT, Sharpe ratio maximisation, efficient frontier analysis

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JEL Classification: G11, G17, O16

1. Introduction

Many Investors try to diversify their holdings and/or seek new opportunities to increase their income. Innovations help them to achieve goals and may also contribute to the overall efficiency and stability of financial markets. Real Estate Investment Trust (REIT) is a good example of an innovative investment vehicle. REITs can play a significant role in the Georgian capital market. The development of REITs could be useful in enhancing the attractiveness and drive of Georgia's financial landscape. However, at the moment of current research (June 2024), no such instrument was introduced in Georgia.

According to the United States National Association of Real Estate Investment Trusts (NAREIT, no date), REITs are described as firms engaged in owning or financing property that yields income across multiple real estate sectors. REITs give investors access to the real estate sector without buying actual property assets. They are similar to mutual funds, but instead of holding stocks or bonds, REITs primarily own, operate, or finance income-generating real estate assets.

Today, REITs play a significant role in investment portfolios. By June 2024, the total equity market capitalisation of the Financial Times Stock Exchange (FTSE) Nareit All REITs Index is $1.328 trillion (NAREIT, 2024).

REITs play an important role in modern investment portfolios, offering consistent, predictable income from rental payments and a hedge against inflation. REITs stand out as a superior diversification tool because of their low correlation with other financial instruments (Imperiale, 2006).

Despite the recognised advantages and growing popularity, there is a noticeable gap in scholarly research regarding their impact within specific investment contexts, such as emerging markets like Georgia. This study is poised to fill this gap by providing an analysis of REITs' influence on portfolio diversification, risk characteristics, and return optimisation within typical Georgian investment portfolios and comparison with global benchmarks by employing key financial metrics (e.g. Sharpe ratio). To do so, because of the absence of Georgian REIT instruments, we employed a financial engineering approach and constructed a simulated financial asset. Furthermore, the framework of

the efficient frontier is used to examine the effects of diversification and the possibilities for enhancement that REITs might present in a diversified portfolio.

The research objectives of the study are:

1. Evaluate the impact of potential Georgian REIT on the performance of different types of portfolios. By examining a range of assets and portfolio types, this research intends to uncover the specific conditions under which REIT contributes most significantly to certain portfolio outcomes.
2. Analyse the role of potential Georgian REIT in portfolio diversification. Using quantitative methodologies, the study will examine correlation dynamics among different asset classes, with a particular focus on the constructed REIT. The goal is to understand how REIT can affect overall portfolio risk through low or negative correlations with other asset classes.
3. Find portfolio structures that maximize the Sharpe ratio. Through the examination of various portfolio configurations, this objective seeks to clarify the influence of REIT on the Sharpe ratio.

The National Bank of Georgia, in collaboration with capital market participants, is engaging in efforts to establish REITs as an investment asset in the Georgian market. Furthermore, the project funded by the United States Agency for International Development and Deloitte Consulting LLP explored the global landscape, examined the regulatory frameworks and offered recommendations for the Georgian government's consideration (USAID, 2023). Therefore, studying REITs as an asset class for the Georgian market is significant and well-timed.

Based on objectives, four research questions are formulated:

1. How may Georgian REIT correlate with different types of assets in investment portfolios?
2. How may Georgian REIT impact portfolio diversification?
3. What impact may Georgian REIT have on the Sharpe ratio of typical investment portfolios?
4. How may Georgian REIT affect the risk-return profile of various investment portfolios?

2. Literature review

Nowadays, investors have access to several types of REITs, like equity, mortgage, and hybrid REITs. The most common type of REITs, known as Equity REITs, specialises in acquiring, managing, and generating earnings from real estate properties. They cover various sectors, including retail, healthcare, commercial, and residential properties. Investors in REITs benefit from direct earnings from real estate, such as rental income, making these REITs attractive for those seeking regular income streams (Krewson-Kelly and Thomas, 2016).

REITs offer an attractive option over direct investments in real estate due to several significant benefits. According to NAREIT (NAREIT; no date), these include competitive long-term performance, stable dividend yields, transparency and liquidity, and portfolio diversification.

Liang and McIntosh (1998) offer a comprehensive study of REITs. Utilising Sharpe's Ratio analysis model, the authors assess the performance of REITs from March 1984 to December 1997. The authors' research incorporates the total returns of various market indices, including the S&P 500, S&P MidCap 400, S&P SmallCap 600, government bonds, and Treasury bills. Their research identifies that while equity REITs aligned closely with their respective investment benchmarks before 1994, their performance surged past these benchmarks after 1994. The evidence of REITs' outperformance post-1994 suggests that these instruments became increasingly relevant for investors seeking diversification benefits and potentially possibly superior returns relative to traditional stocks and bonds (Liang and McIntosh, 1998).

Waggle and Agrrawal (2006) investigate the interactions between Real Estate Investment Trusts and stocks, focusing on how differences in risk and the relationship between these asset classes can provide the most suitable portfolio mix for investors. According to the research, there is a significant influence of anticipated REIT returns on optimal asset allocation decisions.

Lee (2010) offers an analysis of the value of REITs relative to traditional investment assets. Drawing on the analytical framework developed by Liang and McIntosh (1998), which evaluates investments based on their risk-adjusted performance, Lee examines REITs' contributions across various market conditions. His analysis

distinguishes the dual benefits of REITs, diversification and return, particularly highlighting their superior performance compared to corporate and government bonds in varying economic landscapes (Lee, 2010).

Lee and Stevenson (2005) highlight the dual functionality of REITs in investment portfolios. Two critical factors that underpin the advantageous position of REITs within mixed-asset portfolios are low correlations and the specific place of REITs at the midpoint of the equity and fixed-income markets. The study demonstrates that REITs act as a tool for return enhancement in lower-risk settings and as a risk reduction tool as the portfolio moves towards higher risk and return configurations (Lee and Stevenson, 2005).

Wong et al. (2012) conducted a comprehensive analysis of Singapore REITs within multi-asset portfolios, focusing on their diversification benefits and performance improvement potential. The study employs Markowitz's (1987) mean-variance optimisation, the Capital Asset Pricing Model, and the Black-Litterman (1992) model to assess the role and performance of Singapore REITs relative to other primary asset categories, including stocks, government securities, and publicly traded real estate firms. The study constructed efficient frontiers for portfolios containing stocks, government securities, and Singapore REITs to evaluate the diversification benefits of incorporating the latter. The research used traditional Markowitz's mean-variance optimisation to graph how the asset allocation changes with different levels of historical returns. The summary of the statistics included mean monthly returns, standard deviation of returns, variance, and Sharpe ratios to compare their risk-adjusted performance. The study shows that REITs from Singapore offer considerable diversification advantages in a multi-asset portfolio (Wong, Tong and Keow, 2012).

Bhuyan et al. (2014) show that under certain conditions investors of all risk profiles would benefit from a significant allocation towards REITs. Research suggests that REITs play a substantial role in enhancing portfolio diversification and optimising return for given levels of risk.

Other researches proving REITs valuableness in portfolio management for diversification or performance in various setups and environments include Chandrashekaran (1999) and Coskun et al. (2017).

More recent studies indicate that even during severe economic conditions, like during the COVID-19 pandemic, REIT can demonstrate stable performance and may outperform other assets as an effective hedge instrument. Victor et al. (2023) examined the performance of Asian REITs before and during COVID-19. The study concluded that REIT markets in Asia were efficient, with no significant differences in returns or volatility due to the pandemic. Damani et al. (2024) explored the impact of COVID-19 on US REITs, finding reduced performance without significant changes in risk profiles. Sümer (2023) analysed the hedging abilities of various assets, including REITs, during the COVID-19 pandemic in Turkey. The study found that a small subset of REITs offered inflation protection while other assets, like gold and stock indices, did not.

The real estate industry in Georgia is fast-growing and a significant sector within the economy. According to statistical data provided by the National Statistics Office of Georgia, from 2018 to 2022, the number of registered and operational real estate companies rose, especially within the construction industry. 6.5% of Georgia's GDP as of 2022 derived from real estate-related activities.

The Financial Stability Report of the National Bank of Georgia (2023) highlights that post-pandemic recovery and increased migration to the country have significantly boosted real estate demand, leading to an increase in rental prices. The National Bank of Georgia anticipates further growth as the country transitions back to office work from remote working, forecasting that prices will not fall below pre-pandemic levels in the long term (National Bank of Georgia, 2023). Growth is driven by factors such as tourism expansion, easier access to mortgage loans, and urbanisation trends exhibiting interesting opportunities for the REIT market (Skhirtladze and Nakashidze, 2021).

TBC Capital's Report (TBC Capital, 2023) points out that commercial sector rents are predominantly dollarised, with mechanisms often included in lease agreements to hedge currency risk. 77% of the rent is in USD, 15% in GEL, and 7% in EUR.

Galt and Taggart (2024) predict a 4.2% annual increase in apartment sales in Tbilisi for 2023, suggesting a strong demand in the city's real estate market. This trend extends to the secondary market as well.

Several seminal works establish a theoretical framework for the current study. A special place should be assigned to the Modern Portfolio Theory (MPT) introduced by Harry M. Markowitz (1952),

which underscores diversification's role in portfolio selection, advocating for a mix of assets to mitigate risk and optimise returns. Markowitz further elaborated on this topic in his book "Portfolio Selection: Efficient Diversification of Investments" (Markowitz, 1959).

Within the context of Modern Portfolio Theory, the variability of investment returns is quantified using standard deviation as a metric. An increased standard deviation indicates an increased level of risk or uncertainty. Utilising this parameter allows investors to quantitatively assess the risk and construct a portfolio with the objective of optimizing returns for a set risk level. Correlation among portfolio assets is utilized to achieve effective diversification.

Utilising the Efficient Frontier (Markowitz, 1952) allows for a quantitative assessment of the risk-return trade-off, ensuring that portfolios are optimised for the best possible returns at various risk levels. This methodology enables the examination of different investment approaches, asset distributions, or specific asset categories (like REITs), in terms of their impact on a portfolio's overall efficacy.

Another tool used for portfolio evaluation is the Sharpe ratio, introduced by William F. Sharpe (1966). It measures an investment's performance relative to a risk-free asset, adjusting for the investment's risk. This ratio is widely used in finance to assess the additional return an investment provides for each unit of risk.

$$Sharpe\ Ratio = \frac{r_p - r_f}{\sigma_p} \quad (1)$$

Where:

1. r_p is the expected return of the portfolio,
2. r_f is the risk-free rate of return,
3. σ_p is the standard deviation of the portfolio's excess return.

Fundamentally, among two investments yielding the same return, a higher Sharpe ratio offers a greater outcome. In this research, applying the Sharpe ratio can help identify which investments or assets allocation in a portfolio provide the best compensation for their risk, supporting more informed investment decisions.

The general hypothesis of this research can be formulated as follows: “Incorporating Georgian Real Estate Investment Trust into diversified investment portfolios enhances their attractiveness by

positively improving the risk-return trade-off". This enhancement is believed to be reflected in improved diversification benefits and a more favourable risk-adjusted return profile as measured by the Sharpe ratio and assessed by efficient frontier analysis. The hypothesis is tested by a comparative analysis of portfolios' performance with and without REIT.

3. Research methodology and data

In the context of Georgia, where Real Estate Investment Trusts are currently not presented, this study undertakes the innovative approach of constructing a simulated Georgian Residential REIT. The financial instrument is constructed based on Tbilisi residential real estate information.

Quantitative methods are used to analyze the performance of portfolios with different types of assets with and without constructed REIT using statistical techniques and financial methods such as:

- Correlation Analysis, which assess the degree of linear relationship between the returns of REIT and other portfolio assets, providing insights into possible diversification.
- Modern Portfolio Theory. MPT principles will guide the optimization process, aiming to construct portfolios that maximize returns at specific risk levels or, alternatively, minimize risk for a designated expected return.
- Sharpe Ratio Evaluation. By calculating the Sharpe ratio, this study will measure the performance of portfolios adjusted for risk, enabling a comparison of the efficiency of portfolios with and without REIT inclusion.
- Efficient Frontier Analysis. The construction of the Efficient Frontier will allow to identify the optimal portfolios that provide the maximum expected return for a set level of risk, highlighting the contribution of REIT to portfolio efficiency.

The current study utilises secondary data collected from reputable financial databases, industry reports, and academic journals. These sources include the National Bank of Georgia, the National Statistics Office of Georgia, TBC Capital, Galt & Taggart, Bloomberg L.P., Colliers, Georgian Pension Agency, and several academic journals studied in the literature review section.

For creating a simulated Georgian Residential REIT, information was obtained from reports provided by TBC Capital.

Monthly information for 2021-2023 was used. Monthly average sale prices of Tbilisi residential real estate area were used to estimate REIT's value, and monthly rental prices, after deducting estimated costs and expenses, were used to estimate REIT's incomes. Both provided estimates of monthly yields and return variability.

To estimate REIT's appropriate management costs and expenses, information was collected from the report published by the USAID Economic Governance Program and Deloitte (USAID, 2023). Based on the report, the management cost of REIT was set to 1.5% of the value (market sales price of real estate area) of residential real estate per annum. Maintenance cost of residential property was set to 5% of monthly rental price, and insurance costs were estimated as 0.2% of the value of residential real estate per annum.

The following financial assets were used in the study:

1. Georgian Commercial Banks USD Certificate of Deposits (CD) – data is obtained from the National Bank of Georgia.

2. Georgian Treasury Bonds GEORG 2 ¾ 04/22/26 – data is collected from Bloomberg L.P.

3. NASDAQ Index – data is collected from Bloomberg L.P.

4. Georgian Pension Fund Global Equity Portfolio – data is collected from the monthly statements of the pension agency's investment portfolio.

The Pension Fund Global Equity Portfolio (Pension Fund) consists of various Exchange Traded Funds (ETFs), with each component's weight in the Global Equity Portfolio indicated as follows: Vanguard FTSE Emerging Markets ETF at 28.5%, Vanguard FTSE Europe ETF at 24.2%, Vanguard FTSE Pacific ETF at 23.9%, SPDR S&P 500 ETF Trust at 19.0%, iShares Latin America 40 ETF at 3.6%, and Franklin FTSE Canada ETF at 0.8%. These percentages represent the proportionate investment in each ETF relative to the Pension Fund Global Equity Portfolio value as of January 31, 2024 (Georgian Pension Agency, 2024).

In portfolio analysis, CDs and GEO Bonds represent presumably low-risk assets, NASDAQ Index represents Equity market performance and was selected based on broadness and high market capitalisation. The Pension Fund represents a High-Risk Investment Portfolio.

For each of the asset classes, monthly data of the years 2021-2023 are used to calculate the expected return, volatility, Sharpe ratio, and correlation coefficients.

For the risk-free rate factor, 3 Month US Treasury Bill (B 0 01/23/24 Govt.) yield as of December 29, 2023 has been used. The risk-free rate stands at 5.2750%. The data was obtained from Bloomberg L.P.

Four distinct portfolios were constructed for examination of diversification strategies and risk-return dynamics in the study. These portfolios are:

1. Portfolio 1 (low risk): Certificates of Deposit, Georgian Bond, and REIT.
2. Portfolio 2 (equity market): NASDAQ index and REIT.
3. Portfolio 3 (higher risk): Pension Fund and REIT.
4. Portfolio 4 (diversified): A diversified mix including CDs, Georgian Bond, NASDAQ, Pension Fund, and REIT.

For each portfolio configuration, the Sharpe ratio is calculated both in the absence and presence of REIT with different weights to determine the impact of REIT inclusion on portfolio performance. This analysis reveals the optimal asset allocations that maximize the Sharpe ratio, thus improving the portfolio's risk-return framework.

The final part of this research involves the development of the Efficient Frontier for portfolios. This segment clarifies the superior risk-return trade-offs achievable through strategic asset allocation. By constructing and comparing distinct graphs that visualize portfolio performance, it is offering clear insights into the value added by REIT in portfolio diversification. Python code and MS Excel were used for Sharpe ration maximization calculations and efficient frontier construction and analysis.

Research has several limitations. Firstly, the study has a limited scope. It uses the constructed Georgian REIT, which is a simulated investment instrument compared to other financial vehicles that already exist on the market. Performance of a constructed Georgian REIT may diverge from the actual one when it is introduced to the market. Secondly, the study does not include commercial REITs due to the lack of availability of reliable data. Thirdly, external factors, like changes in interest rates, economic conditions, and regulatory requirements at the moment of introduction of Georgian REIT, can have a significant impact on the performance of portfolios.

4. Results and analysis

Research findings show that constructed Georgian residential REIT have the highest expected return (23.46%) for the examined years (2021-2023) among the studied assets. However, the relatively high standard deviation (11.44%) suggests that REIT comes with considerable risk. This makes REIT suitable for investors seeking higher returns and comfortable with significant risk. Results are in Table 1.

Table 1

Expected Return and Standard Deviation of Assets

Asset	Expected Return	Standard Deviation
REIT	23.46%	11.44%
CD	3.45%	0.28%
GEO Bond	5.44%	2.00%
NASDAQ	6.07%	21.84%
Pension Fund	2.84%	16.31%

Source: own study

CDs offer the lowest expected return (3.45%). The low standard deviation of 0.28% reflects the stability and predictability of returns from CDs, but their attractiveness for conservative investors is under question since risk is above zero and yield is lower than that of US Treasury bills. GEO Bond provides a moderate expected return of 5.44% with relatively low risk. The standard deviation of 2.00% indicates low volatility and a more or less stable return. Investing in the NASDAQ offers a moderate expected return of 6.07% but comes with the highest risk, as shown by the standard deviation of 21.84%. The Georgian Pension Fund Global Equity Portfolio (Pension Fund) has the lowest expected return of 2.84%. Despite the low return, the risk level (16.31%) suggests a potential mismatch for conservative investors.

Correlation analysis (Table 2) between these financial instruments is noteworthy. Between NASDAQ index and Pension Fund is a strong positive correlation (0.8058). Positive correlation demonstrates NASDAQ and CDs as well (0.1690), although the coefficient is not high. A positive relationship is shown by Pension Fund and CDs (0.1719) with a low coefficient. But, more interestingly, some assets demonstrate a negative correlation. There is a slight negative

correlation between NASDAQ and REIT (-0.2144), a slight negative correlation is between NASDAQ and GEO Bond (-0.1226), a moderate negative correlation exists between REIT and CD (-0.3274), Pension Fund has a slight negative correlation with REIT (-0.1936) and GEO Bond (-0.1219), and a strong negative correlation demonstrates CDs and GEO Bond (-0.7329).

Table 2

Correlation Matrix

	NASDAQ	Pension Fund	REIT	CD	GEO Bond
NASDAQ	1	0.8058	-0.2144	0.1690	-0.1226
Pension Fund	0.8058	1	-0.1936	0.1719	-0.1219
REIT	-0.2144	-0.1936	1	-0.3274	0.1728
CD	0.1690	0.1719	-0.3274	1	-0.7329
GEO Bond	-0.1226	-0.1219	0.1728	-0.7329	1

Source: own study

According to these results, the answer to the first research question will be that REIT exhibits varying degrees of correlation with different types of assets. The correlations range from slight to moderate and include both positive and, more importantly, negative relationships. These correlations suggest that REIT may be appealing for investment portfolios.

The next step considered the calculation of the Sharpe ratios for these selected investment instruments. Results are presented in Table 3.

Table 3

Sharpe Ratio of Assets

Asset	Sharpe Ratio
REIT	1.59
CD	-6.43
GEO Bond	0.08
NASDAQ	0.04
Pension Fund	-0.15

Source: own study

REIT demonstrated a Sharpe ratio of 1.5899, showing a strong risk-adjusted return. This implies that REIT has returns that reward for the risk. The Sharpe ratio of CD is highly negative (-6.4267), indicating a very poor performance. The Pension Fund also has a negative Sharpe ratio of -0.1492. The GEO Bond shows the Sharpe ratio of 0.08, indicating a modest risk-adjusted return. NASDAQ index with a Sharpe ratio of 0.0365 shows a very low positive risk-adjusted return.

According to the Sharpe ratios, the REIT presents the most attractive risk-adjusted return, making it potentially the best standalone option for investors seeking to maximise returns for a given level of risk.

Furthermore, REIT shows its benefits for creating portfolios and optimising the weights to maximise its Sharpe ratio (Table 4 and Table 5, respectively).

Table 4

Key Performance Metrics of Different Portfolios

Portfolio Composition	Key Performance Metrics		
	Return (%)	Standard Deviation (%)	Sharpe Ratio
CD + Geo Bond	5.44	2.00	0.08
CD + Geo Bond + REIT	23.46	11.44	1.59
NASDAQ	6.07	21.84	0.04
NASDAQ + REIT	21.55	9.95	1.64
Pension Fund	2.84	16.31	-0.15
Pension Fund + REIT	22.09	10.52	1.60
CD + Geo Bond + NASDAQ + Pension Fund + REIT	21.55	9.95	1.64

Source: own study

According to the calculations, the optimal weight of CDs in the CD-Bond portfolio is 0. The result is expected based on the very pure performance of CDs. The optimal portfolio of these two assets is comprised only of Geo Bonds and, obviously, has characteristics of the latter.

Table 5

Optimal Weights of Assets for Maximizing Portfolio Sharpe Ratios

Portfolio Composition	Weights of Assets				
	CD	Geo Bond	REIT	NASDAQ	Pension Fund
CD + Geo Bond	0%	100%	N/A	N/A	N/A
CD + Geo Bond + REIT	0%	0%	100%	N/A	N/A
NASDAQ + REIT	N/A	N/A	88.99%	11.01%	N/A
Pension Fund + REIT	N/A	N/A	93.35%	N/A	6.65%
CD + Geo Bond + NASDAQ + Pension Fund + REIT	0%	0%	88.99%	11.01%	0%

Source: own study

The optimal allocation in the portfolio of CDs, Geo Bond and REIT is 100% of the latter. Again, this indicates that CDs and Bond are underperforming.

The NASDAQ+REIT portfolio showcased a return of 21.55%. Its standard deviation is 9.95%, suggesting a lower risk than a standalone REIT or NASDAQ. This portfolio achieved the highest Sharpe ratio among the strategies at 1.64. This performance underscores the benefits of diversifying with equities and REIT, balancing risk while enhancing returns. This strategy presents a diversified approach, allocating 88.99% to REIT and 11.01% to NASDAQ.

The combination of the Pension Fund with REIT resulted in a return of 22.09%, positioning it above the standalone Pension Fund but below REIT. With a standard deviation of 10.52%, the risk level is lower than such of the mentioned standalone assets, indicating a diversification effect. The Sharpe ratio is 1.60 - close to the NASDAQ-REIT portfolio and higher than standalone REIT or Pension assets have. This indicates that mixing Pension Fund assets with REIT can achieve a better performance. The allocation of REIT is 93.35% with a modest share in the Pension Fund of 6.65%.

The portfolio with the greatest diversification, which included CDs, Bond, NASDAQ, Pension Fund, and REIT demonstrated expected allocation result. Weights of CD, Bond and Pension Fund are 0%, and composition is the same as in the NASDAQ-REIT portfolio.

Obviously, portfolio properties are the same (21.55% return, 9.95% standard deviation, and 1.64 Sharpe ratio).

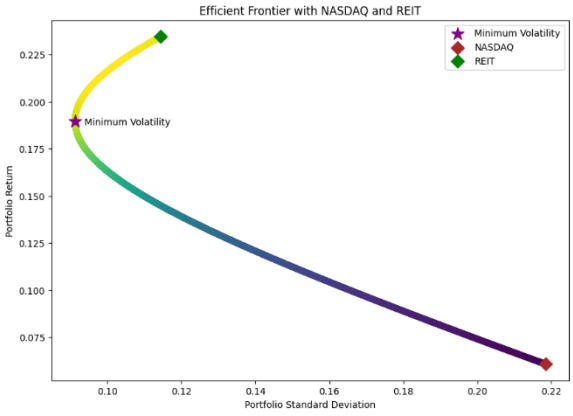
Research reveals that incorporating REIT can significantly enhance risk-adjusted returns. Portfolios that effectively mix asset types not only yield higher returns but also maintain managed levels of risk, demonstrating higher Sharpe ratios.

In the final stage, to assess portfolio risk-return trade-off and also for the graphical representations of portfolio performance, an efficient frontier analysis was conducted. Since the effective composition of Portfolio 1 (CD + GEO Bond + REIT) demonstrated 100% REIT allocation, it is meaningless to analyse it. Portfolio 2 (NASDAQ + REIT) and Portfolio 4 (CD + Geo Bond + NASDAQ + Pension + REIT) have the same effective composition (0% in CDs, GEO Bonds, and Pension assets, 88.99% in REIT and 11.01% in NASDAQ), there is no reason to conduct separate analysis for them; thus, Portfolio 4 was not assessed.

In Figures 1 and 2, portfolios represented by yellow dots represent efficient frontiers. This boundary includes the optimal portfolios, meaning that no additional expected return is attainable without a corresponding increase in risk. Any other allocations either provide less return for the same level of risk (below the line) or have a higher risk for the same level of return (righter of the line). On the contrary, the blue/green dots represent portfolios with the worst risk/return relationship.

Figure 1

Efficient Frontier of Portfolio 2: NASDAQ + REIT



Source: own study

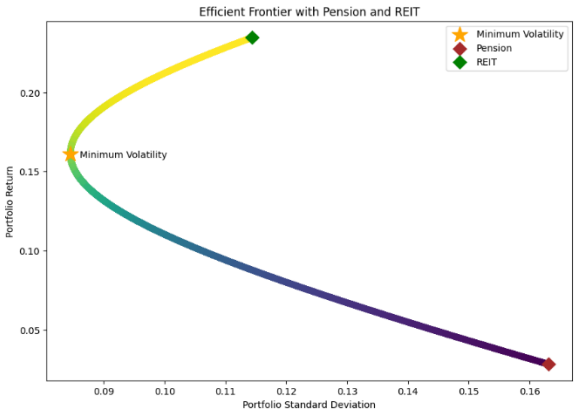
The curve in Figure 1 represents the efficient frontier, indicating the maximum expected return for a given level of risk across various portfolio compositions of NASDAQ and REIT investments.

Marked by a star on the graph is the “Minimum Volatility” point, which represents the portfolio with the lowest standard deviation. For investors with high-risk aversion, this specific portfolio composition is of great interest, as it represents the most stable investment within the given asset pool. Portfolio’s minimum standard deviation is 9.13% and Portfolio Expected Return at this point is 18.90%. The NASDAQ's weight in the minimum risk portfolio is 26.26% and, accordingly, the REIT weight is 73.74%. The highlighted weight acts as a key threshold, the upper part of the chart (yellow curve) shows that portfolios with REIT have a better risk-return trade-off.

The presented curve in Figure 2 shows the efficient frontier for a portfolio combining Pension Fund and REIT. At the “Minimum Volatility” point (indicated by a star), the Pension Fund's weight in the portfolio is 35.35% (REIT’s - 64.65%). The portfolio’s minimum standard deviation is 8.45%, and the expected return at this point is 16.17%.

Figure 2

Efficient Frontier of Portfolio 3: Pension + REIT



Source: own study

Rightward from the star along the efficient frontier (yellow curve), each point represents a gradual increase in the REIT’s weight and expected return, accompanied by an increase in the level of the risk.

5. Conclusion

The study explored the impact of the constructed Georgian residential Real Estate Investment Trust on the performance of diversified investment portfolios, guided by the hypothesis that incorporating REIT enhances portfolio attractiveness by improving the risk-return trade-off. Through the examination of REIT's correlation with various asset classes, this study indicates that REIT exhibits diverse correlations with other asset types, ranging from slight to moderate, including both positive and negative relationships (question 1). These correlations suggest that REIT may play a significant role in investment portfolios by enabling diversification. Diversity underscores the importance of considering REIT in diversified investment strategies, as they offer the potential for higher returns compared to standalone CD, GEO Bond, the NASDAQ index, and the Georgian Pension Fund (question 2).

Moreover, the analysis of Sharpe ratios of standalone assets revealed that REIT presents the most attractive risk-adjusted return among the selected financial instruments, suggesting that it offers a return that compensates well for its risk level, making it an attractive option for investors.

The study further highlights the significant benefits of incorporating REIT into portfolios. Portfolios that included REIT not only yielded higher returns but also demonstrated lower risk levels, as evidenced by their Sharpe ratios (question 3). This demonstrates that strategic asset allocation, involving a mix of REIT with other investment vehicles, can substantially enhance risk-adjusted returns.

Finally, efficient frontier analysis of the portfolios makes clear that REIT can improve the efficient frontier across different investment scenarios and allow to achieve diversified, better balanced, and more profitable investment outcomes (question 4).

The study demonstrates that the creation of the Georgian REIT may be beneficial for the market and investors, including such institutional investors as the Georgian Pension Agency.

In conclusion, the findings of this study confirm the hypothesis that incorporating REIT into diversified investment portfolios enhances their attractiveness by positively improving the risk-return trade-off. REIT contributes to portfolio diversification, offers attractive risk-adjusted returns, and influences the overall performance of investment portfolios positively.

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THE CHINESE NATIONAL HOLIDAY'S INFLUENCE ON THE CHINESE STOCK MARKET AND VARIOUS INDUSTRIES: AN EMPIRICAL ANALYSIS

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Abstract

This treatise delves into the ramifications of the Chinese National Holiday on the Chinese stock market and its constituent industries. Employing a sophisticated analytical framework that integrates volatility and the ARMA model as control variables, this study scrutinises the significance of independent variables indicative of the excess return rates on the trading days immediately preceding and succeeding the Chinese National Holiday. The statistical significance of these independent variables substantiates the hypothesis that the Chinese National Holiday exerts a discernible influence on stock returns. Empirical evidence demonstrates that the Chinese National Holiday engenders a significant and positive impact on the overall Chinese stock market and 18 out of 20 selected industries. Moreover, the holiday effect, discernible before 2008, manifests in the form of elevated excess returns for the notably affected stock market and industries, with the effect's significance extending across a broader spectrum of industries.

Keywords: Holiday effect, Chinese stock market, Industrial analysis, ARMA

JEL Classification: G10, G14, G15, G20

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1. Introduction

The Efficiency Market Hypothesis (EMH) stands as a cornerstone theory within contemporary finance and investment discourse. Broadly construed, EMH posits a scenario wherein stocks are presumed to be traded at their anticipated prices, thereby suggesting that investors encounter no opportunity to accrue additional capital gains arising from mispricing in stock transactions. Despite enduring scrutiny and validation across numerous financial markets by economists and statisticians since its inception by Fama, the progenitor of EMH, certain anomalous phenomena persist across diverse markets or nations, allowing certain investors to pursue a real rate of return surpassing expectations. Subsequent elucidation of this phenomenon attributes it to the Calendar Effect, which typically encompasses manifestations such as the weekend, holiday, monthly, and January effects.

In conformity with this pattern, the Chinese stock market has similarly been subject to investigation, revealing the presence of the holiday effect. As articulated by Yi and Liu (2005), the holiday effect exerts a notable influence within the Shanghai stock market, primarily attributable to shifts in investor sentiment engendered by the occurrence of multiple holidays, thereby significantly impacting their investment decision-making processes.

This study endeavours to scrutinise the existence and magnitude of the holiday effect on Chinese National Holidays within the Chinese stock market, propelled by divergent perspectives. Furthermore, it endeavours to account for variance in influence by comparing four indices and twenty industries across three distinct time periods over the preceding decade.

2. Literature review

2.1. The existence of the holiday effect

The holiday effect gained prominence in the past. A comparative analysis was conducted by juxtaposing the index of the day immediately preceding each New York Exchange holiday with the average of the indexes of the two adjacent days. His findings underscored a significant variance in index values across different trading days. Lakonishok and Smidt (1988) subsequently demonstrated the suitability of the Dow Jones Industrial Average (DJIA) as a viable market portfolio for examination, given its

calculation's exclusion of dividends. Upon rigorous testing, they observed abnormal returns surrounding holidays over a span of 90 years.

Further evidence of the holiday effect within the DJIA context was provided by Tsiakas (2010). Tsiakas's analysis spanning from 1962 to 2005 revealed notable mean returns and reduced volatility during pre- and post-holiday periods compared to other trading days. Kim and Park (1994) posited the existence of significant holiday effects in both the Japanese and UK stock markets. However, they noted that the holiday effect in the UK market was less pronounced due to the market's larger standard deviation in returns compared to its Japanese counterpart.

In European contexts, Dodd and Gakhovich (2011) confirmed significant pre- and post-holiday returns across 14 developing Central and Eastern European markets from 1991 to 2011. Marrett and Worthington (2009) verified the holiday effect in the Australian stock market, while McGuinness (2005) corroborated its presence in the Hong Kong market.

In select developing markets, India has been shown to exhibit a holiday effect by Arumugam (1999). His analysis revealed significant post-holiday returns from 1979 to 1985 and significant pre-holiday returns from 1991 to 1997. Notably, he attributed the absence of a holiday effect during 1985-1991 to the transformation of post-holiday effects into pre-holiday effects.

In the South African futures market, Smit and Smit (1998) observed no significant impact of the holiday effect. Even in the United States, the holiday effect was not ubiquitous across all stock exchanges. Vergin and McGinnis (1999) highlighted that from 1987 to 1996, the pre-holiday returns of the S&P 500 and NYSE indices were comparable to returns on other days, whereas the NASDAQ and AMEX indices exhibited additional returns during the same period. They suggested that as investors adapted to the holiday effect, potential abnormal profits tended to diminish.

2.2. Extra rate of return by holiday effect

Recognising the presence of the holiday effect is essential for comprehending abnormal stock returns before or after holidays. Ariel (1990) noted that, compared to non-pre-holiday returns, the mean of pre-holiday returns surpassed those by 9 to 14 times on average for both CRSP value-weighted and equally-weighted indices. In New

Zealand, pre-holiday returns were, on average, 3.8 times higher than non-pre-holiday returns, a smaller margin than the 9 to 14 times observed in the United States (Vos, Cheung, Bishop, 1993). Additionally, Ariel (1990) observed that since the variance of returns before holidays is lower than that of all other trading days, the heightened pre-holiday returns do not entail extra risk. Kim and Park (1994) echoed these findings and further noted that post-holiday returns lack consistent patterns, unlike pre-holiday returns. Furthermore, evidence from the Taiwan market suggested that high pre-holiday returns were unaffected by the risk-return relationship (Teng and Liu, 2013), bolstering Ariel's assertion.

Some experts contend that firm size interacts with the holiday effect to influence return rates. Lakonishok and Smidt (1984) found that large companies experienced higher returns on the last trading day of the year and around Christmas. Keim and Stambaugh (1984) observed a more pronounced weekend effect on small-enterprise stocks compared to large-corporation stocks. Vergin and McGinnis (1999), analysing US stocks from 1987 to 1996, found that the holiday effect was absent in large corporations but present in small corporations. However, and Park (1994) argued that firm size had no impact on average pre-holiday returns. When using size decile portfolios, the holiday effect was more pronounced for large-firm stocks than small-firm stocks. Removing New Year's Day reduced mean returns on small-firm portfolios. Moreover, once the day-of-the-week effect and pre-New Year's Day effect were accounted for, the size effect on average returns before holidays vanished. Kim and Park (1994) concluded that systematic trading patterns around holidays failed to fully explain the holiday effect.

The influence of foreign holidays on domestic stock markets has also been examined. Kim and Park (1994) found no correlation between holiday effects in the UK and Japanese stock markets and those in the US stock market. However, the Chinese Lunar New Year notably impacts other Asian markets such as Hong Kong, Japan, and South Korea. Yen, Lee, Chen, and Lin (2001) utilised the Average Cumulative Return Index and observed consistently rising cumulative returns before and after the Chinese Lunar New Year based on stock indices in Asian markets. Moreover, the Chinese Lunar New Year is anticipated to continue exerting a substantial impact on Asian markets. Additionally, Dumitriu and Stefanescu (2020) suggested that the Extended Holiday Effect was more visible in relatively quiet periods

than in turbulent ones, and it influences especially the stock returns of small-cap companies.

2.3. Holiday effect in the Chinese market

In China, some research confirmed the presence of the holiday effect in the Shanghai stock market. They observed extreme returns before or after holidays, attributing this phenomenon to the diverse emotional responses of investors before and after holidays. Conversely, the Shenzhen Composite Index exhibited a slightly higher return rate than the mean return. Lai & Cho (2016) highlighted relationships between stock returns and corporate financial ratios, indicating that stock market performance could be predicted to some extent. Interestingly, Lai & Wong (2014) also noted that the extra high returns due to the holiday effect were associated with higher risks.

3. Research analysis

3.1. Hypotheses

In this empirical inquiry, we begin by establishing three underlying assumptions:

1. The Chinese stock market is subject to the Chinese National Holiday effect. It is posited that A-shares exhibit exceptional performance on the first trading days preceding and following the Chinese National Holiday, compared to other trading days. Moreover, it is anticipated that the pre-holiday effect will surpass the post-holiday effect concerning excess return rates.
2. Different A-share industries are differentially affected by the Chinese National Holiday. Acknowledging the substantial impact of the Chinese National Holiday on various industries, it is presumed that distinct industries within A-shares will manifest divergent levels of additional return.
3. Different time periods manifest varying degrees of influence from the Chinese National Holiday effect. It is conjectured that the Chinese National Holiday effect may exert varying degrees of influence across three distinct time intervals: 2005-2007, 2008-2011, and 2012-2015. Initially, the significance of the indices and selected industries will be assessed across these periods. Subsequently, the coefficient values pertaining to the indices and selected industries significant across all time periods will be compared within said periods.

3.2. Data collection and measurement

The prevailing focus in holiday effect research typically involves analysing the daily return rates preceding and succeeding specific holidays or encompassing all holidays within a designated timeframe. To facilitate the computation of daily return rates, the daily closing prices of four indices and twenty industry indices in the Chinese stock market spanning from June 7th, 2005, to December 31st, 2015, were collated. These indices comprise the Shanghai Composite Index, Shenzhen Composite Index, Shanghai Shenzhen 300 Index, and Small Medium Enterprise Composite Index (SME index). The selected industries encompass Aerospace, Automobile, Aviation, Banking, Chemical, Coal, Electricity, Gold, Logistic, Media, Medicine, Nonferrous Metals, Nuclear Power, Oil, Scarce Resources, Security, Shipping, Software, Steel, and Telecommunication. Drawing from Vergin and McGinnis's (1999) insights into the US market, where not all indices exhibited a holiday effect, the aim here is to ascertain whether the overall Chinese stock market across the two stock exchanges, encompassing stocks on the main board and those on the SME board, has been influenced by the Chinese National Day. To ensure comprehensive coverage, most indices in the Chinese stock market were incorporated.

Among the twenty selected industries, ten are derived from Marrett and Worthington's (2009) study on holiday effects in Australia, while the remaining industries were chosen based on their perceived significance in the Chinese economy. The dataset was sourced from the Tongdaxin software, which maintains collaborations with numerous security firms.

Subsequent to the collection of closing prices, the daily rate of return is computed utilising the equation (1):

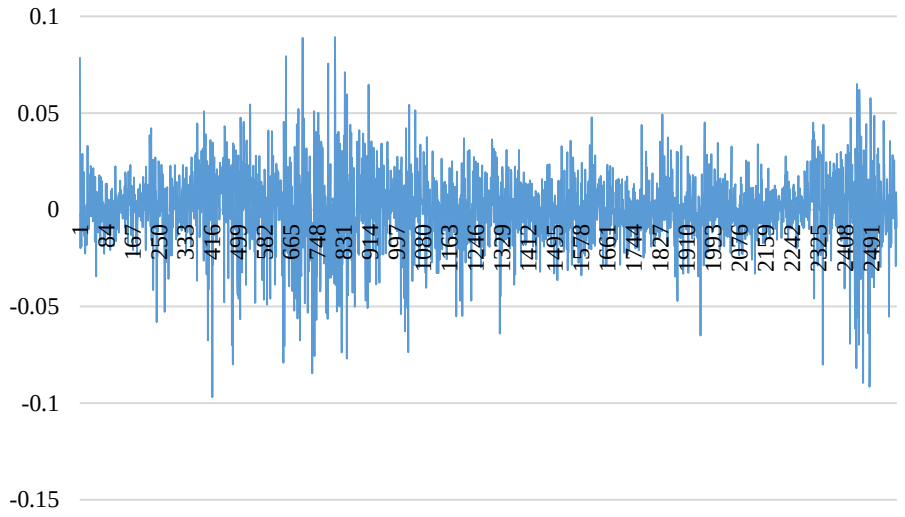
$$R_t = \log_e\left(\frac{P_t}{P_{t-1}}\right) \quad (1)$$

Where: R_t is the rate of return at time t. P_t is the closing price at time t. Figure 1 evinces the rate of return of the Shanghai Shenzhen 300 Index over time t.

Besides, testing the holiday effect one day before and after the holiday requires 2 dummy variables to be added: D_{pre} and D_{post}, and both will be introduced in the following section.

Figure 1

Rate of Return of Shanghai Shenzhen 300 Index



Source: Shanghai Stock Exchange

The model it is used is similar to the model of Marrett and Worthington (2009) and Dodd and Gakhovich (2011), which is:

$$R_t = c + \delta_1 * D_{pre} + \delta_2 * D_{post} + \varepsilon_t \quad (2)$$

Both of their models are to test the significance of the extra rate of return one day before and after the holidays. R_t means the rate of return at time t. c is the constant number and the average rate of return of non-holiday trading date. D_{pre} is the dummy variable of the pre-holiday date. If D_{pre} equals 1, it represents that t is one day before the Chinese National holiday. Otherwise, it equals 0. D_{post} is the dummy variable of the holiday date. If D_{post} equals 1, it represents that t is one day after the Chinese National holiday. Otherwise, it equals 0. δ_n stands for the coefficient of each variable. ε_t is the error term.

Prior to conducting the regression analysis, it is imperative to ascertain whether the daily return rates of all selected samples exhibit stationarity. The unit root test, specifically the Augmented Dickey-Fuller test, is employed for this purpose. The test results indicate that the daily return rates of all indices are stationary.

Acknowledging that various factors can influence daily rate of return, including but not limited to past return rates, news, government policies, or foreign stock market performance, it is necessary to mitigate the impact of past return rates on current rates. To address this, an Autoregressive Moving Average (ARMA) model is applied to Equation (2). A similar approach to test seasonality in the Malaysian stock market was utilized by Pandey (2002). Additionally, recognizing that market volatility can influence return rates, the monthly volatility of the Shanghai Shenzhen 300 index is incorporated into the model. This index is chosen for its ability to reflect the performance of both the Shanghai and Shenzhen stock exchanges simultaneously. Moreover, including daily return rates alone might obscure the additional rate of return before and after holidays, as daily volatility tends to substantially explain the dependent variable.

The determination of the appropriate number of Autoregressive (AR) and Moving Average (MA) terms in the model is crucial. Initially, the regression is conducted with AR (1) and MA (1), and additional AR (p) and MA (q) terms are progressively incorporated until both AR (p) and MA (q) become statistically insignificant. Ultimately, the ARMA (3, 2) model emerges as the most significant. Consequently, the model employed is as follows:

$$R_t = c + \delta_1 * D_{pre} + \delta_2 * D_{post} + \delta_3 * AR(1) + \delta_4 * AR(2) + \delta_5 * AR(3) + \delta_6 * MA(1) + \delta_7 * MA(2) + \varepsilon_t \quad (3)$$

Following the model construction at Equation (3), it is imperative to test for heteroscedasticity in the error term. To facilitate this examination, the ARCH test is employed, revealing that 16 out of 24 samples exhibit heteroscedasticity. Given that most error terms across all samples demonstrate both heteroscedasticity and serial correlation, which can compromise coefficient estimation accuracy, we adopt the Newey-West method to address these issues. Despite some samples exhibiting homoscedastic error terms, the Newey-West method consistently yields coefficients closer to our expectations compared to the Estimation Default and White methods, as per the approach outlined by Marrett and Worthington (2009).

Subsequently, the collected data is inputted into the model to obtain results. The coefficient and t-test probability of the dummy variable serve as pivotal indicators to determine the existence of the Chinese National Holiday effect in the Chinese stock market. If the coefficient of either dummy variable deviate significantly from zero at a

specified significance level (1%, 5%, or 10%), the National Holiday effect is deemed to be present. Under the null hypothesis, the coefficient of either dummy variable is assumed to be zero. Given that the dependent variable is stationary, a t-test is applicable to the entire coefficient.

3.3. Descriptive analysis

All data were sourced from the Shanghai Stock Market and Shenzhen Stock Market, spanning nearly ten years from June 8th, 2005, to December 31st, 2015. The dataset comprises a total of 2572 observations, distributed as 626, 976, and 970 observations for the periods 2005-2007, 2008-2011, and 2012-2015, respectively. The mean serves as a measure of the average daily return, while the standard deviation quantifies the overall daily risk over the selected period.

Examining different market performances, the Shanghai index exhibits the smallest mean and standard deviation, while the SME index demonstrates the highest mean and standard deviation. Table 1 elucidates that over the past decade, the Shanghai Stock Exchange has been more stable than the Shenzhen Stock Exchange, characterized by relatively lower return rates and risks. Moreover, stocks in the SME sector have shown more active performance compared to those in the main board market. This phenomenon suggests a positive correlation between return rates and risks. Among the 20 industries observed over the past decade, the Gold sector exhibits the highest average daily return and daily risk, whereas the Telecommunication sector displays the lowest average return. Furthermore, the Security sector ranks third in terms of return rate, yet its risk is even lower than that of the Telecommunication sector. Comparing the mean and standard deviation of these industries with those of the indices, it is apparent that while their return rates fluctuate, their risks remain relatively stable.

To assess whether the rate of return of the selected samples follows a normal distribution, the Kolmogorov-Smirnov Test is employed. This test serves as a normality test, with the null hypothesis positing that the rate of return is normally distributed. If the asymptotic significance is less than 1%, the null hypothesis is rejected. Given that all significance levels are below 1%, the null hypothesis for normality is rejected, indicating that the rate of return is not normally distributed.

Table 1

Descriptive statistics

Variables	Minimum	Maximum	Mean	Std	Skewness	Kurtosi	Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
HS300	-.0970	.0893	.000581	.0189733	-.488	3.092	3.9482	0.0000
Shindex	-.0926	.0903	.000480	.0177486	-.521	3.691	4.4115	0.0000
Szindex	-.0975	.0916	.000600	.0199198	-.437	2.457	3.4518	0.0000
SMEindex	-.0970	.0935	.001012	.0204068	-.592	2.252	3.5847	0.0000
Aero	-.3884	.0894	.000983	.0275512	-1.436	16.745	7.0464	0.0000
Auto	-.6723	.0898	.000631	.0257471	-7.276	181.836	5.0381	0.0000
Avia	-1.2863	.0899	.000441	.0338967	-21.437	807.560	3.5324	0.0000
Bank	-.1049	.0955	.000706	.0204000	-.032	3.760	4.4059	0.0000
Chem	-.5812	.0804	.000605	.0237904	-6.114	139.303	5.0004	0.0000
Coal	-.1031	1.1775	.000910	.0347085	15.074	513.386	6.2160	0.0000
Elec	-.6434	.0883	.000297	.0228600	-8.981	245.130	6.2020	0.0000
Gold	-.1733	.8227	.001255	.0303392	7.616	209.319	4.5866	0.0000
Logi	-.3298	.0954	.001007	.0260204	-1.270	11.597	3.9202	0.0000
Media	-.8122	.0952	.000566	.0288851	-8.971	243.756	5.0907	0.0000
Medic	-1.0948	.0896	.000618	.0291462	-20.816	775.948	7.4285	0.0000
Nonf	-.1018	.9623	.001115	.0322021	10.159	308.389	4.6638	0.0000
Nucl	-.1036	1.0034	.000868	.0300133	14.238	484.373	6.3620	0.0000
Oil	-.5036	.0922	.000114	.0226302	-4.364	97.424	5.8187	0.0000
Scare	-.0943	1.3229	.001215	.0358029	19.455	721.908	5.9875	0.0000
Secu	-.1918	.0953	.000974	.0296158	-.140	2.181	3.3670	0.0000
Ship	-.1054	.3442	.001182	.0301571	.512	8.118	3.5108	0.0000
Softw	-.0979	.0951	.001206	.0227340	-.539	1.811	3.0951	0.0000
Stee	-.0981	.8697	.000690	.0279135	11.549	365.346	5.8445	0.0000
Tele	-.1058	.1215	.000605	.0237471	-.016	3.567	3.8068	0.0000

The abbreviations used are as follows: HS300 for Shanghai Shenzhen 300 Index; Shindex for Shanghai Composite index; Szindex for Shenzhen Composite index; SMEindex for SME index; Aero for Aerospace; Auto for Automobile; Avia for Aviation; Bank for Banking; Chem for Chemistry; Elec for Electricity; Logi for Logistic; Medic for Medicine; Nonf for Nonferrous Metals; Nucl for Nuclear Power; Scare for Scarce Resources; Secu for Security; Softw for Software; Stee for Steel; Tele for Telecommunication.

Source: Shanghai Stock Exchange and Shenzhen Stock Exchange

3.4. Empirical testing

According to our three hypotheses, the Chinese National Holiday effect is examined across three dimensions: Pre-holiday (Pre-H) and Post-holiday (Post-H) effects, industries, and periods. The results are presented in Tables 1, 2, 3, 4 and 5. To streamline the presentation of essential data in the tables, certain independent variables are omitted, resulting in a simplified layout with only six columns.

Testing Hypothesis 1 involves assessing the significance of every pair of dummy variables representing the 4 indices, to ascertain whether the Chinese National Holiday exerts a discernible effect on the Chinese stock market. While all Post-H dummies for the indices prove insignificant at the 10% significance level, the strong significance of the

4 Pre-H dummies indicates the existence of a Holiday effect, particularly on Chinese National Day, over the last decade. Additionally, all significant Pre-H dummy variables exhibit positive coefficients, implying a beneficial effect on stock returns. Notably, the SME index and HS300 index display higher levels of significance compared to the Shanghai Composite index and Shenzhen Composite index. The Shanghai Composite Index shows the lowest extra return rate, approximately 0.66%.

Furthermore, with the same degree of significance, the SME index yields higher excess returns compared to the HS300 index. This finding suggests that firms with relatively smaller sizes may experience a stronger holiday effect on stock performance, consistent with observations in the American market by Vergin and McGinnis (1999) and in the Australian market by Marrett and Worthington (2009).

Moving to the second dimension, industries, as stipulated in Hypothesis 2, Table 1 reveals that 18 out of 20 industries exhibit a notable holiday effect at or below the 10% significance level. Only the Aerospace and Aviation sectors demonstrate no or subtle holiday effects. Among these 18 industries, ten sectors (Banking, Chemistry, Electricity, Logistics, Medicine, Nonferrous Metal, Nuclear, Scarce Resource, Software, Steel) exhibit significance levels below 1%. While most industries primarily display a noticeable Pre-H effect, the Telecommunication sector stands out with a significant Post-H effect only. Additionally, the Medicine and Security sectors demonstrate both significant Pre-H and Post-H effects, with the Pre-H effect prevailing over the Post-H effect based on the coefficient comparison.

Furthermore, among industries exhibiting significant National Holiday effects (both Pre-H and Post-H), the coefficient values elucidate the extent of such effects on excess return rates. The Telecommunication sector boasts the highest excess return rate, nearly 1.9%. The Security sector also prominently reflects the holiday effect, exhibiting both Pre-H and Post-H effects, with the second-highest excess return rate (1.4%) in both categories. Additionally, the Gold, Nonferrous Metal, and Scarce Resource sectors demonstrate excess return rates exceeding 1%, while the Oil sector exhibits the lowest added value of 0.47%, substantially lower than other industries.

Table 2

OLS Regression on Measurement of Constants, Pre-H Dummy (D-pre), Post-H Dummy (D-post) and R^2 for 2005-2015

2005-2015		C	D-pre	D-post	R^2
HS300	Coef.	0.0032	0.0091***	0.0091	1.642%
	Std.e	0.0011	0.0029	0.0076	
Shindex	Coef.	0.0033	0.0066**	0.0086	1.713%
	Std.e	0.0010	0.0026	0.0074	
Szindex	Coef.	0.0030	0.0110**	0.0105	1.604%
	Std.e	0.0012	0.0031	0.0079	
SMEindex	Coef.	0.0034	0.0095***	0.0096	1.556%
	Std.e	0.0013	0.0020	0.0069	
Aero	Coef.	0.0025	0.0062	0.0078	0.851%
	Std.e	0.0019	0.0046	0.0084	
Auto	Coef.	0.0027	0.0109***	0.0057	1.300%
	Std.e	0.0014	0.0034	0.0074	
Avia	Coef.	0.0038	0.0025	0.0030	1.963%
	Std.e	0.0018	0.0092	0.0083	
Bank	Coef.	0.0036	0.0070***	0.0094	1.175%
	Std.e	0.0010	0.0023	0.0110	
Chem	Coef.	0.0028	0.0071***	0.0100	1.613%
	Std.e	0.0014	0.0026	0.0067	
Coal	Coef.	0.0034	0.0091**	0.0099	1.087%
	Std.e	0.0017	0.0044	0.0149	
Elec	Coef.	0.0017	0.0075***	0.0072	0.954%
	Std.e	0.0012	0.0020	0.0058	
Gold	Coef.	0.0033	0.0124**	0.0087	1.372%
	Std.e	0.0019	0.0060	0.0140	
Logi	Coef.	0.0037	0.0080***	0.0088	1.399%
	Std.e	0.0014	0.0027	0.0080	
Media	Coef.	0.0034	0.0097*	0.0047	0.840%
	Std.e	0.0015	0.0057	0.0061	
Medic	Coef.	0.0018	0.0078***	0.0118**	1.001%
	Std.e	0.0014	0.0027	0.0064	
Nonf	Coef.	0.0049	0.0107***	0.0070	1.039%
	Std.e	0.0018	0.0038	0.0125	
Nucl	Coef.	0.0032	0.0075***	0.0059	1.126%
	Std.e	0.0016	0.0025	0.0075	
Oil	Coef.	0.0031	0.0047x	0.0033	1.571%
	Std.e	0.0011	0.0028	0.0077	
Scare	Coef.	0.0045	0.0121***	0.0079	0.686%
	Std.e	0.0018	0.0038	0.0120	
Secu	Coef.	0.0043	0.0138**	0.0138*	0.998%
	Std.e	0.0017	0.0069	0.0078	
Ship	Coef.	0.0038	0.0098*	0.0077	1.587%
	Std.e	0.0021	0.0056	0.0105	
Softw	Coef.	0.0044	0.0092***	0.0095	2.010%
	Std.e	0.0016	0.0029	0.0083	
Stee	Coef.	0.0039	0.0071***	0.0018	1.204%
	Std.e	0.0014	0.0021	0.0086	
Tele	Coef.	0.0029	0.0069	0.0188**	1.343%
	Std.e	0.0013	0.0046	0.0085	

****Significant at the 1% level,**Significant at the 5% level,*Significant at the 10% level.*

The abbreviation above stands for: HS300 for Shanghai Shenzhen 300 Index; Shindex for Shanghai Composite index; Szindex for Shenzhen Composite index; SMEindex for SME index; Aero for Aerospace; Auto for Automobile; Avia for Aviation; Bank for Banking; Chem for Chemistry; Elec for Electricity; Logi for logistic, Medic for Medicine; Nonf for Nonferrous Metal; Nucl for Nuclear Power; Scare for Scare Resource; Secu for Security; Softw for Software; Stee for Steel; Tele for Telecommunication.

Source: Shanghai Stock Exchange and Shenzhen Stock Exchange

Table 3

OLS Regression on Measurement of Constants, Pre-H Dummy (D-pre), Post-H Dummy (D-post) and R^2 for 2005-2007

2005-2007		C	D-pre	D-post	R^2
HS300	Coef.	0.0017	0.0121**	0.0041	2.058%
	Std.e	0.0019	0.0050	0.0078	
Shindex	Coef.	0.0028	0.0079	0.0066	3.308%
	Std.e	0.0018	0.0053	0.0098	
Szindex	Coef.	0.0021	0.0147***	0.0055	3.717%
	Std.e	0.0022	0.0055	0.0093	
SMEindex	Coef.	0.0010	0.0121***	0.0040	0.517%
	Std.e	0.0021	0.0042	0.0049	
Aero	Coef.	0.0024	0.0089	−0.0082	2.058%
	Std.e	0.0012	0.0064	0.0069	
Auto	Coef.	−0.0008	0.0118*	−0.0031	2.397%
	Std.e	0.0028	0.0067	0.0074	
Avia	Coef.	0.0021	0.0120**	−0.0141***	3.510%
	Std.e	0.0024	0.0054	0.0054	
Bank	Coef.	0.0038	0.0119**	0.0383***	3.892%
	Std.e	0.0019	0.0061	0.0148	
Chem	Coef.	0.0009	0.0088*	−0.0021	3.700%
	Std.e	0.0025	0.0052	0.0076	
Coal	Coef.	−0.0010	0.0162*	0.0003	1.097%
	Std.e	0.0027	0.0096	0.0029	
Elec	Coef.	−0.0009	0.0108**	−0.0040	4.899%
	Std.e	0.0023	0.0050	0.0084	
Gold	Coef.	0.0011	0.0093	0.0020	2.625%
	Std.e	0.0035	0.0078	0.0121	
Logi	Coef.	0.0035	0.0063	−0.0026	2.769%
	Std.e	0.0033	0.0073	0.0147	
Media	Coef.	0.0042	−0.0026	−0.0111	4.389%
	Std.e	0.0028	0.0070	0.0073	
Medic	Coef.	0.0008	−0.0001	−0.0060	4.827%
	Std.e	0.0025	0.0060	0.0092	
Nonf	Coef.	0.0024	0.0084	0.0011	4.365%
	Std.e	0.0030	0.0092	0.0085	
Nucl	Coef.	−0.0003	0.0022	−0.0048	5.390%
	Std.e	0.0026	0.0063	0.0082	
Oil	Coef.	0.0050	0.010685**	−0.0079	3.015%
	Std.e	0.0021	0.0050	0.0078	
Scare	Coef.	0.0017	0.0064	−0.0034	4.555%
	Std.e	0.0028	0.0082	0.0090	
Secu	Coef.	0.0035	0.0198	0.0068	1.756%
	Std.e	0.0028	0.0123	0.0153	
Ship	Coef.	0.0000	0.0029	−0.0041	1.923%
	Std.e	0.0033	0.0099	0.0100	
Softw	Coef.	0.0016	0.0064	−0.0077	2.546%
	Std.e	0.0026	0.0086	0.0120	
Stee	Coef.	0.0009	0.0014	−0.0076	4.504%
	Std.e	0.0026	0.0046	0.0077	
Tele	Coef.	0.0012	0.0182	0.0173	2.439%
	Std.e	0.0018	0.0119	0.0148	

****Significant at the 1% level,**Significant at the 5% level,*Significant at the 10% level.*

The abbreviation above stands for: HS300 for Shanghai Shenzhen 300 Index; Shindex for Shanghai Composite index; Szindex for Shenzhen Composite index; SMEindex for SME index; Aero for Aerospace; Auto for Automobile; Avia for Aviation; Bank for Banking; Chem for Chemistry; Elec for Electricity; Logi for logistic, Medic for Medicine; Nonf for Nonferrous Metal; Nucl for Nuclear Power; Scare for Scare Resource; Secu for Security; Softw for Software; Stee for Steel; Tele for Telecommunication..

Source: Shanghai Stock Exchange and Shenzhen Stock Exchange

Table 4

OLS Regression on Measurement of Constants, Pre-H Dummy (D-pre), Post-H Dummy (D-post) and R^2 for 2008-2011

2008–2011		C	D-pre	D-post	R^2
HS300	Coef.	0.0039	0.0108**	0.0076	2.892%
	Std.e	0.0020	0.0049	0.0196	
Shindex	Coef.	0.0036	0.006554*	0.0056	2.990%
	Std.e	0.0018	0.0040	0.0186	
Szindex	Coef.	0.0035	0.0150	0.0088	3.245%
	Std.e	0.0021	0.0045	0.0181	
SMEindex	Coef.	0.0036	0.0087**	0.0065	4.079%
	Std.e	0.0021	0.0035	0.0152	
Aero	Coef.	0.0034	−0.0053	−0.0004	3.188%
	Std.e	0.0023	0.0048	0.0178	
Auto	Coef.	0.0033	0.0108***	0.0073	1.999%
	Std.e	0.0016	0.0034	0.0099	
Avia	Coef.	0.0047	−0.0209*	−0.0034	1.874%
	Std.e	0.0025	0.0123	0.0182	
Bank	Coef.	0.0046	0.0053*	−0.0064	2.740%
	Std.e	0.0019	0.0028	0.0230	
Chem	Coef.	0.0036	0.0074**	0.0103	4.471%
	Std.e	0.0021	0.0036	0.0156	
Coal	Coef.	0.0056	0.0043	0.0241	2.592%
	Std.e	0.0027	0.0062	0.0377	
Elec	Coef.	0.0023	0.0084***	0.0040	4.880%
	Std.e	0.0019	0.0028	0.0131	
Gold	Coef.	0.0037	0.0187	0.0251	2.451%
	Std.e	0.0031	0.0139	0.0353	
Logi	Coef.	0.0037	0.0060	−0.0007	3.772%
	Std.e	0.0024	0.0065	0.0133	
Media	Coef.	0.0040	0.0087***	0.0240	2.496%
	Std.e	0.0024	0.0032	0.0116	
Medic	Coef.	0.0020	0.0103***	0.0127	1.265%
	Std.e	0.0016	0.0032	0.0079	
Nonf	Coef.	0.0057	0.0172**	0.0208	2.293%
	Std.e	0.0028	0.0079	0.0321	
Nucl	Coef.	0.0020	0.0055**	0.0046	4.904%
	Std.e	0.0022	0.0026	0.0170	
Oil	Coef.	0.0031	0.0056	0.0023	3.856%
	Std.e	0.0018	0.0106	0.0106	
Scare	Coef.	0.0049	0.0156**	0.0161	2.812%
	Std.e	0.0025	0.0073	0.0306	
Secu	Coef.	0.0018	0.0150	0.0253**	2.558%
	Std.e	0.0032	0.0147	0.0122	
Ship	Coef.	0.0047	0.0144	0.0002	2.041%
	Std.e	0.0031	0.0146	0.0228	
Softw	Coef.	0.0037	0.0130***	0.0064	2.679%
	Std.e	0.0023	0.0042	0.0157	
Stee	Coef.	0.0042	0.0088***	−0.0002	3.911%
	Std.e	0.0025	0.0033	0.0222	
Tele	Coef.	0.0029	0.0015	0.0140**	1.572%
	Std.e	0.0023	0.0063	0.0060	

****Significant at the 1% level,**Significant at the 5% level,*Significant at the 10% level.*

The abbreviation above stands for: HS300 for Shanghai Shenzhen 300 Index; Shindex for Shanghai Composite index; Szindex for Shenzhen Composite index; SMEindex for SME index; Aero for Aerospace; Auto for Automobile; Avia for Aviation; Bank for Banking; Chem for Chemistry; Elec for Electricity; Logi for logistic, Medic for Medicine; Nonf for Nonferrous Metal; Nucl for Nuclear Power; Scare for Scare Resource; Secu for Security; Softw for Software; Stee for Steel; Tele for Telecommunication.

Source: Shanghai Stock Exchange and Shenzhen Stock Exchange

Table 5

OLS Regression on Measurement of Constants, Pre-H Dummy (D-pre), Post-H Dummy (D-post) and R^2 for 2012-2015

2012-2015		C	D-pre	D-post	R^2
HS300	Coef.	0.0026	0.0084**	0.0102	5.747%
	Std.e	0.0018	0.0042	0.0080	
Shindex	Coef.	0.0027	0.00712**	0.0098	6.051%
	Std.e	0.0018	0.0030	0.0073	
Szindex	Coef.	0.0024	0.0091**	0.0146	4.967%
	Std.e	0.0022	0.0042	0.0119	
SMEindex	Coef.	0.0036	0.0096***	0.0148**	4.033%
	Std.e	0.0023	0.0022	0.0081	
Aero	Coef.	0.0025	0.0200**	0.0329***	2.605%
	Std.e	0.0036	0.0101	0.0068	
Auto	Coef.	0.0029	0.0163**	0.0160**	2.114%
	Std.e	0.0022	0.0073	0.0069	
Avia	Coef.	0.0034	0.0203	0.0202***	2.803%
	Std.e	0.0037	0.0149	0.0050	
Bank	Coef.	0.0017	0.0066**	0.0029	4.496%
	Std.e	0.0015	0.0030	0.0031	
Chem	Coef.	0.0025	0.0088*	0.0154*	4.471%
	Std.e	0.0026	0.0051	0.0088	
Coal	Coef.	0.0030	0.0044	0.0021	0.896%
	Std.e	0.0029	0.0041	0.0106	
Elec	Coef.	0.0016	0.0095**	0.0075	3.100%
	Std.e	0.0023	0.0056	0.0064	
Gold	Coef.	0.0034	0.0131**	−0.0034	1.202%
	Std.e	0.0026	0.0064	0.0112	
Logi	Coef.	0.0031	0.009927**	0.0211***	2.151%
	Std.e	0.0023	0.0039	0.0079	
Media	Coef.	0.0023	0.0201*	−0.0005	0.876%
	Std.e	0.0028	0.0114	0.0081	
Medic	Coef.	0.0020	0.0109**	0.0168**	1.400%
	Std.e	0.0024	0.0046	0.0086	
Nonf	Coef.	0.0043	0.0099**	−0.0001	1.269%
	Std.e	0.0028	0.0046	0.0096	
Nucl	Coef.	0.0048	0.0061	0.0127	1.446%
	Std.e	0.0031	0.0057	0.0089	
Oil	Coef.	0.0013	0.0017	0.0097	2.078%
	Std.e	0.0019	0.0019	0.0062	
Scare	Coef.	0.0044	0.0077	0.0003	0.967%
	Std.e	0.0032	0.0051	0.0099	
Secu	Coef.	0.0053	0.0025	0.0088	3.458%
	Std.e	0.0024	0.0073	0.0128	
Ship	Coef.	0.0029	0.0171**	0.0304***	4.070%
	Std.e	0.0038	0.0081	0.0084	
Softw	Coef.	0.0059	0.0119***	0.0221**	3.797%
	Std.e	0.0028	0.0028	0.0103	
Stee	Coef.	0.0039	0.0043	0.0071	1.134%
	Std.e	0.0023	0.0046	0.0070	
Tele	Coef.	0.0029	0.0061*	0.0230	3.063%
	Std.e	0.0021	0.0034	0.0192	

****Significant at the 1% level,**Significant at the 5% level,*Significant at the 10% level.*

The abbreviation above stands for: HS300 for Shanghai Shenzhen 300 Index; Shindex for Shanghai Composite index; Szindex for Shenzhen Composite index; SMEindex for SME index; Aero for Aerospace; Auto for Automobile; Avia for Aviation; Bank for Banking; Chem for Chemistry; Elec for Electricity; Logi for logistic, Medic for Medicine; Nonf for Nonferrous Metal; Nucl for Nuclear Power; Scare for Scare Resource; Secu for Security; Softw for Software; Stee for Steel; Tele for Telecommunication.

Source: Shanghai Stock Exchange and Shenzhen Stock Exchange

After scrutinising various industries to evaluate hypothesis 3, the ten years is divided into three periods to observe how the Chinese National Holiday effect evolved before and after the financial crisis. Data provided in Table 3, Table 4, and Table 5 reveals that the number of industries exhibiting significant Pre-H or Post-H effects (2005-2007: 10, 2008-2011: 18, 2012-2015: 18) increased after the 2008 financial crisis. Only six sectors, including the Shanghai Shenzhen 300 index, SME index, Automobile, Banking, Chemistry, and Electricity, consistently display significant effects across all three periods.

For the Shanghai Shenzhen 300 Index, the significance level remains stable at or below 5%; however, the added value of the stock return rate declines from 1.21% to 0.84%. Conversely, the significance level of the SME Index rises to 5% in the second period before returning to 1% in the third period. The Shanghai Composite Index exhibited no significant effect until 2008, after which the effect became more pronounced with higher confidence levels and more significant coefficients in the last two periods. In contrast, the Shenzhen Composite Index shows more significant National Holiday Day effects before 2008, with higher coefficients, while it only regains significance after 2012 with relatively lower coefficients. The coefficient value of Pre-H also begins at 1.21%, decreases, and eventually rises to 0.96%, slightly surpassing that of the Shanghai Shenzhen 300 index. For the 4 aforementioned industries, the extra rate of return induced by Pre-H effect starts at its highest level before the financial crisis, decreases after 2008, and then rises again somewhat since 2012.

Another noteworthy finding is that the number of sectors demonstrating evident Post-H effects is only 2 in the first and second time periods, but this figure increases to 9 in the third period. When both Pre-H and Post-H are significant, the coefficient values of Post-H are mostly higher than those of Pre-H, all of which remain above 1.5%.

Consequently, for all three hypotheses, the conclusion is as follows: for hypothesis 1, on the first trading day before and after the Chinese National Holiday, the rate of return tends to exhibit an additional positive performance compared with other trading days, with the pre-holiday return being more significant than the post-holiday return. For hypothesis 2, most industries are affected by the Chinese National Holiday, primarily by the pre-holiday effect, and the extra return rates of industries vary. The Telecommunication industry demonstrates the highest extra return rate (1.9%), while the Oil industry exhibits the smallest (0.47%). For hypothesis 3, different

periods exhibit distinct Chinese National Holiday effects, which broaden after 2007.

4. Discussion

The conspicuous Pre-H effect on the Chinese National Day underscores the immaturity of the Chinese stock market. According to the Efficient Market Hypothesis (EMH), the domestic stock market lacks efficiency, leading to the inability of the public to gather all available information, consequently resulting in abnormal stock return rates.

A pivotal factor contributing to the emergence of the holiday effect is the expectations of public investors. Over the past 11 years, a prevailing positive sentiment towards stock performance during vacations has existed. Currently, the National Holiday stands as the sole 7-day holiday, apart from the Spring Festival, in China, especially after the Labor Day vacation was shortened post-December 2007. Consequently, with increased promotions from firms, more individuals opt for travel or make purchases during the Chinese National Day vacation, potentially bolstering domestic consumption and profits for related businesses. Moreover, investors perceive the Chinese National Holiday as a positive factor for the stock market, leading them to buy and hold stocks before the holidays. To mitigate uncertain risks during vacations, many funds prefer to inflate stock prices before withdrawal. These factors likely contribute to the prevalence of the Chinese National holiday effect primarily before the vacation rather than after.

Furthermore, the Chinese National holiday effect has significantly impacted more industries since the 2008 Financial Crisis, possibly due to investors' tendency towards irrational behaviour during such periods. However, as the Chinese stock market matures, this holiday effect is expected to diminish gradually in the future.

5. Conclusion

The Chinese National Day, one of China's extended holidays, has a considerable influence on people's daily lives, investors' expectations, and trading strategies. To scrutinise our three hypotheses, we selected four stock indices and twenty industries from the Shanghai Stock Exchange and Shenzhen Stock Exchange for data analysis. Employing the Ordinary Least Squares (OLS) method with corrections by Newey-West to account for heteroscedasticity and

autocorrelation, we applied the same model to 24 sectors for four time periods: 2005-2007, 2008-2011, 2012-2015, and 2005-2015.

The empirical results have validated the significance of all our hypotheses. Over the period 2005-2015, the Pre-H effect manifested significantly more frequently than the Post-H effect, with all coefficient values of notable Pre-H effects being positive. Thus, Hypothesis 1 receives affirmative confirmation. Furthermore, as depicted in Table 1, 18 out of 20 industries and four indices exhibited strong significance in Pre-H effects, with coefficient values ranging from 0.66% to 1.24%. These findings substantiate the meaningfulness of Hypothesis 2, indicating that different industries are variably affected by the Chinese National Day. Additionally, it is noteworthy that after 2008, the number of significant Pre-H and Post-H variables increased significantly from 10 to 18 by 2015. Particularly in the same period, the number of significant Post-H variables increased from 2 to 9. However, among those sectors exhibiting Pre-H effects from 2005-2007 to 2012-2015, the first period demonstrated the most significant coefficient values. Overall, these findings corroborate Hypothesis 3.

Our evidence suggests that different industries may exhibit varying significance levels in the Chinese National Day effect, particularly the Pre-Holiday effect. Hence, it would be intriguing for further research to focus on the relationship between market indices and industries and how this factor may affect the added value on stock returns in the market.

This study makes a significant contribution to the existing literature by providing a comprehensive empirical analysis of the influence of Chinese national holidays on the stock market and various industries. Through the application of advanced econometric techniques, including event study methodology and regression analysis, this research quantifies the holiday effect and investigates its differential impacts across various sectors, thereby deepening our understanding of market behaviour during these unique temporal periods.

The findings reveal that the stock market exhibits distinct patterns of volatility and liquidity surrounding national holidays, with varying impacts on different industries. For instance, consumer goods and travel sectors demonstrate heightened activity and price adjustments, while technology and manufacturing sectors may experience more subdued responses. By dissecting these sector-specific reactions, the study highlights the critical role that market

sentiment and consumer behaviour play during holiday periods, often influenced by cultural factors intrinsic to Chinese society.

Moreover, this research underscores the importance of institutional factors and investor psychology in explaining the observed phenomena. The theoretical implications suggest that the holiday effect is not merely a statistical anomaly but a manifestation of deeper behavioural finance principles, including herd behaviour and the disposition effect. These insights open new avenues for future research, encouraging scholars to explore further how cultural and temporal factors shape market dynamics in different contexts.

This study not only enriches the field of finance by providing empirical evidence of the holiday effect in China but also emphasises the necessity for a multidisciplinary approach. By doing so, it lays a solid foundation for future investigations into the complex interplay between cultural events and financial markets, thereby contributing to a more nuanced understanding of market behaviour.

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RECONNOITERING AND MAPPING AN EFFECT OF FINANCIAL SOCIALISATION ON FINANCIAL LITERACY: A CRITICAL LITERATURE REVIEW[1]

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Abstract

The financial industry is complicated, with a wide range of goods, services, and ideas that people may find challenging to understand independently without the right training and direction. Many consumers lack the knowledge to comprehend financial language, investment possibilities, and debt management measures. The foundation of financial literacy is laid by financial socialisation. Parental money management education imparts the fundamental knowledge and abilities required to successfully manage one's own finances. Through a literature review, this study investigated the impact of parental financial socialisation on financial literacy globally. This study adopted an exploratory research design where an empirical review of the literature was undertaken. The results showed that generally parental financial socialisation has an influence on financial literacy globally, despite some few studies that contradicted this view. The current study makes a unique contribution to the body of knowledge as is among the first to investigate the influence of parental financial socialisation on financial literacy of young adults globally. This study recommends that parents be keenly aware that their actions and behaviours around money and their own financial decision-making will likely leave a lasting impression on their children.

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1. Introduction

The financial industry is complicated, with a wide range of goods, services, and ideas that people may find challenging to understand on their own without the right training and direction (Feyen, Frost, Gambacorta, Natarajan & Saal, 2021). Many consumers lack the knowledge to comprehend financial language, investment possibilities, and debt management measures. Financial literacy now faces both new opportunities and challenges due to the spread of financial technology, or fintech. Although technology has increased accessibility to financial services, it has also brought forth new hazards and complexities that people might not completely comprehend (Javaid, Haleem, Singh, Suman, & Khan, 2022). Individuals have demonstrated inadequate money management, and compared to prior generations, they are determined to be less financially competent in saving for retirement and unexpected expenses (Fan & Park, 2021). The amount of debt owed by people has skyrocketed, and many are requesting debt assessment programmes from debt counsellors (BusinessTech, 2021). Because people were impacted differently by the shocks that followed the recent financial crisis, it's possible that this financial vulnerability worsened as a result of the crisis. Research (Lusardi et al., 2010; Hudson et al., 2017) has demonstrated that people are ill-prepared to handle financial obligations and obstacles due to a lack of financial understanding. People's lack of financial literacy is concerning and has to be addressed. Gaining financial literacy is essential for supporting long-term financial stability and enabling better financial decision-making (Karim, Wahid, Ariffin, Nor, Nazlan & Kassim, 2023). The foundation of financial literacy is laid by financial socialisation. Financial socialisation is defined as the process of influencing an individual on financial matters by family members. Moreover, Financial socialisation refers to the process through which individuals develop their attitudes, beliefs, values, norms, behaviours, and skills related to money and financial matters. This process typically begins in childhood and continues throughout life, influenced by various social factors such as family, peers, education, media, and

cultural context. Parents play an important role in financial socialisation.

Parental money management education imparts the fundamental knowledge and abilities required to manage one's own finances successfully. Adulthood frequently sees the persistence of the financial habits and behaviours observed and taught during childhood and adolescence (Zhao & Zhang, 2020). Responsible financial behaviours can be influenced later in life by positive financial socialisation experiences, such as budgeting, saving money, and making wise financial judgements. People get financially socialised and learn from the failures and achievements of others. Those aware of the negative effects of making bad financial decisions—like overspending or debt accumulation—can avoid comparable traps in their own financial lives (Karim et al., 2023). Setting financial goals and planning to accomplish them are key components of effective financial socialisation. A sense of financial responsibility and forethought is fostered by learning to save money for long-term objectives like retirement or school and short-term necessities like emergencies. Parents' financial socialisation can aid in developing resilience and coping mechanisms in their children so they can handle financial difficulties and disappointments (LeBaron-Black, Kelley, Hill, Jorgensen, & Jensen, 2023). Therefore, it is critical to comprehend how parental financial socialisation affects financial literacy. There are extremely few studies that have looked into how parental financial socialisation affects financial literacy worldwide through a review of the literature. This is one of the first studies to examine this problem, emphasising global space. The current study contributes to the body of existing knowledge. It fills the gap in the literature by investigating the impact of financial socialisation by parents on financial literacy worldwide through a literature review. Studies conducted on financial socialisation are reviewed to get a picture of the impact of parental financial socialisation on financial literacy.

The remainder of this article is structured as follows: Section 2 provides methodology. Section 3 covers an empirical review of the literature. Section 4 indicates the results of the review. Section 5 provides conclusions and recommendations.

2. Methodology

This study adopted an exploratory research design where an empirical literature review was undertaken to explore the impact of parental financial socialisation on financial literacy worldwide, both in developed and developing countries. Studies conducted on parental financial socialisation were reviewed to get a picture of the impact of parental financial socialisation on financial literacy. Studies were selected and included in the analysis if they focused on parental financial behaviour, teaching, discussions, monitoring and communication of finances to their children. This choice of criteria is to get a broader view of parental financial socialisation and its influence on financial literacy. Moreover, these are mainly identified as mechanisms for parents to facilitate financial socialisation. Scientific search engines searched articles, and keywords such as financial literacy and financial socialisation were used. The researcher re-examined academic literature on the subject, regardless of publication age. The reviewed publications were downloaded using four key database search engines: Web of Science, Scopus, JSTOR, Education Resources Information Center (ERIC), ProQuest, Science Direct, Google Scholar, and Z-library. The selected resources are among the most popular and largest internet search engine databases for financial literacy and socialisation studies. Both quantitative and qualitative studies that indicated parental financial socialisation were included. A total of 212 articles were screened, and 86 articles were included in the review.

3. Empirical review of literature

First, studies that revealed a strong relationship between parental financial socialisation and financial literacy are reviewed, followed by those that found a weak or insignificant association.

A study by Mehta and Keng (1985) examined how family affects financial behaviour, attitudes, knowledge, and social and economic spending incentives in 359 Singaporean teenagers. The study found that family discussions on consumption concerns boost adolescent economic consumption impulses. An examination of 512 Kentucky children's money knowledge and use and parents' money education strategies indicated that parents' financial habits and money training affect children's financial understanding, management, and attitude (Marshall & Magruder, 1960).

Cude, Lawrence, Lyons, Metzger, LeJune, Marks, and Machtmes (2006) found that parents influence young adults' money management the most. Jorgensen (2007) examined parental influence on student financial knowledge, attitude, and behaviour. Parental influence was seen in pupils with higher financial attitudes, behaviour, and knowledge ratings.

Shim et al. (2009) examined parental financial socialisation, financial knowledge, and financial well-being in US young adults. Parents' financial interactions were highly linked to higher financial awareness, financial well-being, and academic performance in young adults. Lusardi et al. (2010) found that college students with parents who invested in equities and retirement savings comprehend risk diversification better. Serido et al. (2010) surveyed 2,098 first-year university students in the US to evaluate how parents affect their children's financial behaviour, well-being, and financial emancipation as adults. They found that parental financial ties improve children's financial coping, well-being, competence, and emancipation as adults. In a panel research of 2002/2003 income data, Kim et al. (2011) examined how parental financial monitoring, warmth, and parent-child finance communications affected the financial behaviour of 1,471 US teenagers. More parent-child donation conversations improve children's ability and willingness to save and donate. A favourable relationship between parental warmth and saving for the future was observed, and providing children with an allowance was reported to decrease financial concerns.

Research by Kim and Chatterjee (2013) studied how childhood financial participation affects financial behaviour, practices, and asset selections in US young adults. The study indicated that financial socialisation in childhood is linked to good financial habits and asset ownership in young adulthood. The young adults whose parents witnessed their spending and financial behaviour as children were financially confident. Akben-Selcuk and Altiok-Yimaz (2014) examined parental financial teaching and financial literacy among 853 Turkish university students. Financial literacy was also positively correlated with parental financial education.

In Bangkok, Grohmann and Menkhoff (2015) examined how parents affect children's financial behaviour. Parental training affects young adults' financial behaviour the most. Grohmann, Kouwenberg, and Menkhoff (2015) examined financial literacy in 500 Thai middle-class persons. They found that family improves young adults' financial

literacy. Serido et al. (2015) examined how parental financial socialisation affects 2,098 US young adults' financial attitudes and behaviours through romantic relationships. The study found that romantic partners' and parents' financial behaviour positively affects young adults' financial behaviour and attitude. Akben-Selcuk (2015) evaluated budgeting, saving, and debt repayment trends among 1,539 Turkish college students. The results demonstrated that parental financial education improves debt repayment, budgeting, and saving.

In an investigation, Mahapatra et al. (2016) examined financial literacy determinants in 425 college students in Hyderabad and Secunderabad, India. The results showed that respondents' family income, parents' educational level, and profession strongly influence students' financial literacy in saving, borrowing, and investing, but parents' education levels do not. Parents who manage their finances have a big impact on students' insurance knowledge. The results also showed that parental financial discussions and instruction about finances and saving hurt students' financial literacy. The study also indicated that kids look up to their parents in money management. Sundarasen, Rahman, Othman, and Danaraj (2016) examined money management, financial literacy, financial socialisation agents, and parental norms among Malaysian postgraduate students. The study showed that financial literacy, socialisation agents, and family standards affect young adults' money management. Homan (2016) examined 2,000 Dutch homes to evaluate how parental financial education affects children's savings and borrowing. The study indicated that financial education encourages saving and reduced borrowing. Parental financial education throughout childhood was also found to be more beneficial. Mohamed (2017) evaluated the financial socialisation, conduct, knowledge, and well-being of 391 young Malaysian workers. Parental financial socialisation was positively correlated with financial knowledge and good financial behaviour. Rosenberg (2017) examined wealth, financial literacy, and parental financial guidance among US teenagers. Financial knowledge and parental financial guidance are favourably connected with young adult wealth.

Palaci, Jimenez, and Topa (2017) revealed that parental economic socialisation improves Spanish young adults' retirement financial planning. Kim and Torquati (2019) discovered that parents' financial practices strongly influence college kids' financial attitudes. Fan and Chatterjee (2019) studied how financial socialisation affects

student loan repayment and stress. Results show that students who learned about finances from their parents worry less about student debt.

A cross-sectional survey of 446 young adults by Utkarsh, Pandey, Ashta, Spiegelman, and Sutan (2020) examined how financial socialisation, literacy, and attitude towards money affect financial well-being. Results demonstrated that financial discussions with parents as children improve financial well-being.

Family financial socialisation affects financial outcomes, literacy, conduct, and well-being, according to Zhao and Zhang (2020). The results showed that parental financial socialisation improves financial literacy, behaviour, and well-being. LeBaron, Holmes, Jorgensen, and Bean (2020) investigated whether parental financial education during childhood increases good money management behaviours in emerging adults. Parents' financial education during childhood was associated with healthier financial behaviours in emerging adults. Li, Zuiker, Mendenhall, and Montalto (2021) examined how family financial socialisation affects Asian college students' financial attitudes, knowledge, and behaviours. Asian college students' financial behaviour was favourably correlated with family financial socialisation. According to LeBaron-Black et al. (2023), financial socialisation affects spending behaviour. There was more parental effect on spending behaviour. Ghafoor and Akhtar (2024) examined how parental financial socialisation affects Generation Z's finances. The findings showed that parents involve children in savings, financial decisions, and household and personal finances to financially socialise them. Fletcher and Wright (2024) investigated the relationship between financial socialisation and financial understanding among young children. The results showed that financial understanding is about 10% higher for children whose parents regularly discuss with their children how they spend their money. Ahmad (2024) investigated the influence of parental financial socialisation and financial literacy on the subjective financial well-being of community college students in Johor. Using correlation analysis, the study found that parental financial socialisation has a direct and significant influence on financial literacy. Additionally, these teachings affected financial well-being.

Financial socialisation research in Africa is scarce. Ansong and Gyensare (2012) examined the financial literacy of 250 working University of Cape Coast students in Ghana. A moderate correlation was established between financial literacy and mother's education.

Chowa and Despard (2014) examined how apparent financial socialisation by parents and guardians affected the financial conduct of 3,623 12-to-19-year-olds in eight Ghanaian areas. Parental financial socialisation and youth financial conduct were strongly correlated in the study.

Nomlala (2021) examined the financial socialisation of 1,582 accounting students at South African universities. Accounting students are financially socialised by their immediate family, and parents' education level is statistically relevant. Antoni and Saayman (2021) explored how financial socialisation methods affected 263 young financial professionals in the Eastern Cape concerning financial literacy. The results showed that parental financial training and modelling improve young financial professionals' financial literacy.

Antoni, Rootman, and Struwig (2019) examined how parental financial socialisation affects 350 students' finances. Financial socialisation methods include financial instruction and monitoring, modelling, and reinforcement greatly affect students' financial behaviour. Antoni (2018) examined 350 Nelson Mandela University students to investigate how family structure and financial socialisation affect financial abilities. The study indicated that family patterns and financial socialisation affect student finances. Sallie (2015) examined how socialisation affects financial literacy and security among 300 urban financial services workers. Financial literacy was not significantly affected by parents, friends, colleagues, and peers. However, the study revealed that financial education, books, multimedia, and formal schooling affect financial literacy.

We know little about parental financial socialisation in Africa, particularly South Africa, among black African parents and their children in rural and low-income communities.

Few empirical investigations on parental financial socialisation reported weak or insignificant relationships. Webley and Nyhus (2006) examined the influence of Dutch parents on children's future orientation and saving. The results demonstrated that parents' financial conversations with their kids have little impact on their financial behaviour.

Brau, Holmes, and Israelsen (2010) state that learning sources affect financial literacy among 1,500 US young adults. The study found that family and background had little effect on financial literacy. However, Brau et al. (2010) claim that experience learning boosts financial literacy in young adults. Jorgensen and Salva (2010)

examined 420 young adults in Tennessee, Nevada, Oklahoma, South Dakota, Idaho, and Virginia to see if parents affect financial literacy. Results demonstrated a beneficial impact on the financial mindset. However, parents did not affect young adults' financial understanding. The financial mindset had little effect on financial behaviour. Albeerdy and Gharleghi (2015) evaluated financial socialisation agents and literacy in 105 Malaysian students. Financial literacy and financial socialisation agents were weakly correlated. They also found that 77% of students depended on their parents for financial information. Sohn et al. (2012) found that in South Korea, family, the most important source of financial information, does not affect teenagers' financial literacy as much as schools, media, and friends. Schooling, family income, and parents' occupation and qualifications do not affect students' financial literacy through parental financial socialisation, according to Kaur, Vohra, and Arora (2015). Ameer and Khan (2020) discovered no correlation between family and friend financial socialisation and financial literacy and confidence.

Parental financial socialisation is criticised. Williams (2009) claims that young individuals learn most of their financial information at home but warns that most parents teach based on their personal money feelings. Drever et al. (2015) suggest starting parental financial socialisation with their children early so they can progress through each developmental stage and improve financial understanding and money management. The timing of financial socialisation is crucial. Parents must understand their role in their children's financial socialisation and how it will affect their money management (Head, 2014).

4. Analysis and discussions

This study conducted a literature review of studies on the impact of parental financial socialisation on financial literacy. Table 1 indicates studies that were reviewed and analysed to obtain the results.

Table 1

Literature review results

Measurement	Frequency	Percentage
Parental financial socialisation positively impacts financial literacy	67	78%
No impact of parental financial socialisation on financial literacy	10	12%
Weak association between parental financial socialisation and financial literacy	6	7%
A negative association between parental financial socialisation and financial literacy	3	3%
Total	86	100%

Source: Authors' compilation

As shown in Table 1, 86 studies were included in the analysis to obtain the results. Most of the studies (78%) revealed a positive influence of parental financial socialisation on financial literacy. 12% of the studies indicated that parental financial socialisation does not impact financial literacy. 7% of the studies showed a weak association between parental financial socialisation and financial literacy. 3% of the studies indicated a negative association between parental financial socialisation and financial literacy. These studies also revealed that financial socialisation and financial literacy have several components used as measures by different studies.

Table 2 indicates measurements of parental financial socialisation and financial literacy.

Table 2

Measurements of parental financial socialisation and financial literacy

Parental financial socialisation	Financial literacy
Parental financial teaching	Financial knowledge
Parental financial discussions	Financial behaviour
Parental financial communication	Financial attitudes
Parental financial monitoring	Financial decision-making
Parental financial behaviour	

Source: Authors' compilation

As indicated in Table 2, the measurements of parental financial socialisation are parental financial teaching, monitoring, discussions, financial behaviour of parents and financial communication to foster financial literacy. Studies indicated that parents use these mechanisms to facilitate financial socialisation, which, in the long run, influences children's financial literacy. The proxies used by various studies to measure financial literacy are financial knowledge, financial behaviour, financial attitude, and financial decision-making when financial socialisation is investigated. The results categorised by these measurements revealed a significant positive relationship between parental financial socialisation and financial knowledge. The present study also showed a significant positive relationship between parental financial socialisation and financial behaviour. The results showed that financial attitude has a significant positive relationship with parental financial socialisation. Concerning financial decision-making, the results showed a significant positive relationship with parental financial socialisation. Thus, overall results indicate a significant positive relationship between parental financial socialisation and financial literacy. Thus, their parents influence individuals who achieve higher scores on financial knowledge. Similarly, it was found that financial discussions with parents around budgeting and savings positively correlate with students' better financial knowledge. Parental influence is a key determinant of positive financial behaviours. Accordingly, the results showed that parental financial socialisation influences adolescents' financial behaviour.

Financial education by parents during childhood is linked with a greater frequency of healthy financial behaviours in emerging adulthood. Furthermore, the results revealed that young adults' financial attitudes are shaped by parental financial monitoring. Thus, parental financial monitoring fosters children's early financial independence. It teaches them to make their own decisions, which leads to experience in making financial decisions. However, it is important to note that few studies, as reported in the literature review, found no, weak, and negative association between parental financial socialisation and financial literacy. Therefore, there seems to be an ongoing contestation and debate around this matter.

Based on the comprehensive review of the literature and the majority of studies that supported the influence of parental financial socialisation on financial literacy, this study concluded that parental financial literacy has a positive impact on financial literacy.

5. Conclusions

This study aimed to investigate the impact of parental financial socialisation on financial literacy worldwide through a literature review. Studies conducted on parental financial socialisation and financial literacy were reviewed to get a complete picture of whether financial socialisation by parents influences individuals' financial literacy levels. The results showed that parental financial socialisation generally influences financial literacy globally, despite some studies contradicting this view. The current study makes a unique contribution to the body of knowledge by reviewing various studies conducted on the influence of parental financial socialisation on financial literacy. Although most studies reviewed were conducted in developed countries, few were also conducted in developing studies which is encouraging. However, a gap in parental financial socialisation studies in developing countries still warrants more investigation.

The practical implications and the multiplier effects of this study are clear demonstrations that parental financial socialisation is very important, and the role of parents is substantial in ensuring that children learn financial matters, which will affect their level of financial literacy and how they manage their finances now and also in future. Parents with good financial behaviour and sound financial management practices are more likely to pass on these skills to their children, those children are more likely to develop strong financial literacy skills. When these children grow up, they are likely to adopt similar practices with their own offspring, leading to a generational improvement in financial literacy. A population with higher financial literacy tends to make better financial decisions, leading to increased savings, reduced debt levels, and more prudent investment choices. This can contribute to long-term economic stability at both the household and national levels.

Policymakers could use the research to design initiatives that support parental financial education, such as workshops or incentives for parents to engage in financial literacy activities with their children. This can lead to more widespread financial literacy in society.

The innovative scientific contribution is that this study introduced new or improved measurement tools for assessing both parental financial socialisation practices and financial literacy outcomes. These tools will capture more nuanced aspects of financial education, such as the impact of digital financial tools, informal discussions about money, or emotional aspects of financial decision-

making. This could lead to more accurate and comprehensive assessments in future research, improving the ability to measure the effectiveness of financial education efforts.

This study recommends that parents should be mindful that their money behaviours and financial decisions may have a lasting impact on their children. Parents should communicate more directly with their kids about money. This may include including the child in family finances, discussing difficulties, and offering financial options. Parents should discuss buying decisions with children and include them in budget conversations. Parents should be conscious of their direct teachings and how their financial actions affect their children's skills. Parents should urge their kids and young people to take formal financial education classes. Parents should also learn about personal financial management to educate their children on proper financial management and be good financial role models. Financial educators, practitioners, and the government should create financial programmes for educated parents to improve their financial literacy and young adults' financial well-being. The limitations of this study centre around the fact that the review might be biased towards studies published in peer-reviewed journals, potentially overlooking relevant studies that have not been published due to negative results or lack of significance or unpublished dissertations and thesis.

Future research can focus on other financial socialisation agents to determine the impact on financial literacy through empirical investigation and also through literature review and review studies from university repositories.

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