

Day-of-the-Week Anomaly in Stock Returns: A Study of Pre- and Post-Merger Analysis of Canara Bank

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Abstract: *Stock market anomalies such as the day-of-the-week effect challenge the weak-form Efficient Market Hypothesis by suggesting that returns can be predicted using past information. This study examines whether a day-of-the-week effect exists in the daily returns of Canara Bank (CANBK) and the Nifty Bank index, and whether the pattern changed after the amalgamation of Syndicate Bank into Canara Bank in April 2020. Using daily closing prices, the study computes daily returns and applies one-way ANOVA across weekdays, as well as independent sample t-tests to compare pre- and post-merger CANBK returns and CANBK versus Nifty Bank returns. Across all tests, the null hypotheses could not be rejected, indicating no statistically significant day-of-the-week effect in either CANBK or Nifty Bank, and no significant difference in weekday patterns before and after the merger or between CANBK and Nifty Bank. These findings support weak-form efficiency with respect to day-of-the-week anomaly in the Indian banking segment during the sample period and suggest that simple timing strategies based on weekdays are unlikely to generate abnormal returns in these securities.*

Keywords: Day-of-the-week effect, Calendar anomalies, Canara Bank, Nifty Bank, Merger

1. Background

Stock market analysis remains a dynamic field because predicting returns is central to investment decisions, particularly for short-term traders. The Efficient Market Hypothesis (EMH) states that prices fully reflect available information, making it impossible to consistently outperform using past data [1].

However, over time, many market anomalies have been identified, whose existence challenges EMH. One such market anomaly is the day-of-the-week anomaly, which is a pattern where returns differ based on the weekday. Some weekdays show repeated low returns while other weekdays show higher returns, suggesting that timing the buying of securities on low return days and timing the sale of securities on high return days could lead to profit. Studies document lower Monday returns and higher Friday returns in various markets [2], [3]. In India, research on BSE Sensex, BSE-200, and Nifty confirms significant Monday and Friday effects [4]-[7].

However, more recent research suggests that the Indian banking sector-wise results within India are mixed [8]-[11]. The Indian banking sector is heavily regulated and sensitive to monetary policy, macroeconomic news and regulatory changes. Within this context, Canara Bank (CANBK) is a large public sector bank and a constituent of the Nifty Bank index. In April 2020, Syndicate Bank was amalgamated into Canara Bank, creating a larger merged entity and potentially altering its risk-return profile and trading behaviour. It is therefore relevant to test (i) whether the day-of-the-week effect exists in CANBK and Nifty Bank, and (ii) whether the weekday return patterns changed after the merger.

This paper uses daily return data for CANBK and Nifty Bank to test for day-of-the-week anomaly before and after the merger and to compare CANBK with Nifty Bank. The main result is that all tests fail to reject the null hypotheses: there is no statistically significant day-of-the-week effect in either series, and no evidence that the merger changed the weekday pattern. This outcome supports weak-form efficiency with respect to the day-of-the-week anomaly for these banking securities over the sample period.

1.1 Global and Indian day-of-the-week anomaly studies:

Global studies consistently document Monday negativity and Friday positivity. Gibbons & Hess [2] found strong Monday losses across S&P 500, Dow 30, and CRSP portfolios using dummy regressions. Vidal-Garcia and Vidal [3] confirmed this pattern in equity funds from 35 countries (1990-2024).

Indian evidence also shows the existence of the day-of-the-week anomaly. Singhal et al. [4] detected Monday-Friday effects in BSE Sensex, BSE 200, and Nifty using t-tests. Kaushik [5] found day-of-the-week effects were strongest in small-caps via GARCH models and weaker in large/mid-caps. Dutta and Das [6] and Kedia and Satpathy [7] confirmed Monday effects in Nifty data using dummy regressions.

1.2 Day-of-the-week anomaly in the Banking sector:

Banking sector studies show weakening anomalies. Arora & Bajaj [8] found day-of-the-week effects in 2 out of 6 banks (Canara and BoB) but not in the remaining 4 banks (2003-2016). Singh & Das [9] found no day-of-the-week effect in BSE Bankex (2010-2019) via OLS/GARCH. Daliwala [10] reported negligible effects in Nifty Bank/Nifty 50 (2000-

2022). Bhatia et al. [11] showed mixed results across different events.

Prior studies focus on indices rather than individual bank stocks post-merger. Arora & Bajaj [8] examined Canara Bank stock, but the sample period ended in 2016, missing the 2020 Syndicate merger impact. This study fills the gap by testing pre- (2015-2020) vs post-merger (2020-2025) day-of-the-week effects in Canara Bank stock returns.

2. Objectives and Hypotheses

The study has four main objectives:

- 1) To examine whether a day-of-the-week effect exists in the daily returns of Canara Bank during the pre-merger period.
- 2) To examine whether a day-of-the-week effect exists in the daily returns of Canara Bank during the post-merger period.
- 3) To compare the weekday pattern in CANBK returns before and after the Canara–Syndicate merger.
- 4) To compare the weekday pattern in CANBK returns with that of Nifty Bank.

Corresponding null and alternative hypotheses are:

H1: Pre-merger day-of-the-week effect (2015-2020)

- H0₁: There is no significant difference in the mean daily returns of CANBK across the five trading days of the week during the pre-merger period (2015–2020)
- H1₁: There is a significant difference in the mean daily returns of CANBK across the five trading days of the week during the pre-merger period (2015–2020)

H2: Post-merger day-of-the-week effect (2020-2025)

- H0₂: There is no significant difference in the mean daily returns of CANBK across the five trading days of the week during the post-merger period (2020-2025)
- H1₂: There is a significant difference in the mean daily returns of CANBK across the five trading days of the week during the post-merger period (2020-2025)

H3: Average weekday returns comparison between CANBK pre- and post- merger

- H0₃: There is no significant difference in the pattern of mean daily returns across the days of the week between the pre-merger and post-merger periods for Canara Bank

- H1₃: There is a significant difference in the pattern of mean daily returns across the days of the week between the pre-merger and post-merger periods for Canara Bank

H4: CANBK average weekday returns vs Nifty Bank Index average weekday returns

- H0₄: There is no significant difference in the pattern of mean daily returns across the days of the week between CANBK and the Nifty Bank index
- H1₄: There is a significant difference in the pattern of mean daily returns across the days of the week between CANBK and the Nifty Bank index

3. Data and Methodology

The study uses daily closing prices of Canara Bank (CANBK) and the Nifty Bank index from Google Finance for a sample period covering both pre-merger window (2015-2020) and post-merger window (2020-2025) around the amalgamation of Syndicate Bank into Canara Bank on 1 April 2020. Non-trading days and holidays are excluded. Daily returns are computed as: $r_i = \left(\frac{P_t}{P_{t-1}}\right) - 1$

Where r_i is the daily returns of stock i , P_t is the current day's price, and P_{t-1} is the previous day's price.

Variables

- **Dependent variable:** Daily return (r)
- **Independent variable:** Day of the week (Monday to Friday), represented by dummy variables for ANOVA and t-test.

The following tests are applied:

- 1) **One-way ANOVA** tests mean return differences across weekdays (Mon-Fri) separately for CANBK and Nifty Bank returns. Non-significant F ($p > 0.05$) implies no day-of-the-week effect (H0₁, H0₂).
- 2) **Pairwise two-sample t-tests** (unequal variances) compare: (a) CANBK pre- vs post-merger daily returns (H0₃: no pattern shifts post-2020 merger); (b) CANBK vs Nifty Bank returns over common periods (H0₄: no stock-sector difference).

4. Result and Discussions

- i) **Pre- merger and post-merger day-of-the-week effect (2015-2025)**

Table 1 (a): ANOVA Descriptive Statistics (CANBK & Nifty Bank Index)

SUMMARY								
Groups	Pre-Merger CANBK (2015-2020)				Post-Merger CANBK (2020-2025)			
	Count	Sum	Average	Variance	Count	Sum	Average	Variance
Monday	244	-0.55418	-0.00227	0.001065	243	0.05623	0.000231	0.000895
Tuesday	246	-0.24106	-0.00098	0.000624	248	0.781272	0.00315	0.000692
Wednesday	247	0.107428	0.000435	0.001155	245	0.645674	0.002635	0.000564
Thursday	247	-0.33642	-0.00136	0.000614	251	0.34216	0.001363	0.000455
Friday	244	0.182207	0.000747	0.000668	242	0.163517	0.000676	0.000616

SUMMARY								
	Pre-Merger Nifty Bank Index (2015-2020)				Post-Merger Nifty Bank Index (2020-2025)			
Groups	Count	Sum	Average	Variance	Count	Sum	Average	Variance
Monday	244	-0.27702	-0.00114	0.000321	243	0.034537	0.000142	0.000301
Tuesday	246	-0.07858	-0.00032	0.000118	248	0.786243	0.00317	0.000208
Wednesday	247	0.17	0.000688	0.000168	245	0.279681	0.001142	0.000161
Thursday	247	0.029064	0.000118	0.000166	251	0.078287	0.000312	0.000152
Friday	244	0.365917	0.0015	0.000157	242	-0.01883	-7.8E-05	0.000192

Source: Computed by author based on daily closing prices from Google Finance

Table 1b: One-way ANOVA Results for Weekday Returns of CANBK and Nifty Bank Index (Both pre- and post-merger)

ANOVA								
	Pre-Merger CANBK		Post-Merger CANBK		Pre-Merger Nifty Bank Index		Post-Merger Nifty Bank Index	
	Between Groups	Within Groups	Between Groups	Within Groups	Between Groups	Within Groups	Between Groups	Within Groups
SS	0.002	1.009	0.002	0.787	0.001	0.227	0.002	0.248
df	4.000	1223.000	4.000	1224.000	4.000	1223.000	4.000	1224.000
MS	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000
F	0.472		0.596		1.308		2.159	
P-value	0.756		0.665		0.265		0.072	
F crit	2.379		2.379		2.379		2.379	

Source: Computed by author based on daily closing prices from Google Finance

The one-way ANOVA for CANBK tests H_{01} and H_{02} . Table 1b shows $F = 0.47$ ($p = 0.76$, $df = 4.00$) for the pre-merger period and $F = 0.60$ ($p = 0.67$, $df = 4.00$) post-merger. Both p-values are above 0.05, not rejecting the null hypothesis of equal mean returns across weekdays at the 5% significance level. A statistically significant day-of-the-week effect does not exist in CANBK returns for both periods. Table 1b shows the one-way ANOVA results for Nifty Bank Index weekday

returns, where $F = 1.31$ ($p = 0.26$, $df = 4.00$) for the pre-merger period and $F = 2.16$ ($p = 0.07$, $df = 4.00$) post-merger. As P values are above 0.05, we do not reject the null hypothesis, indicating that the day-of-the-week effect does not exist in the Nifty Bank Index for both periods.

ii) Average weekday returns comparison between CANBK pre- and post- merger

Table 2: Weekday return t-Tests (CANBK Pre- vs Post-Merger Returns)

t-Test: Two-Sample Assuming Unequal Variances											
	Monday		Tuesday		Wednesday		Thursday		Friday		
	Pre-merger	Post-merger	Pre-merger	Post-merger	Pre-merger	Post-merger	Pre-merger	Post-merger	Pre-merger	Post-merger	
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Variance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Observations	244.00	243.00	246.00	248.00	247.00	245.00	247.00	251.00	244.00	242.00	
Hypothesized Mean Difference	0.00		0.00		0.00		0.00		0.00		
df	482.00		491.00		440.00		483.00		483.00		
t Stat	-0.88		-1.79		-0.83		-1.31		0.03		
P(T<=t) one-tail	0.19		0.04		0.20		0.09		0.49		
t Critical one-tail	1.65		1.65		1.65		1.65		1.65		
P(T<=t) two-tail	0.38		0.07		0.41		0.19		0.98		
t Critical two-tail	1.96		1.96		1.97		1.96		1.96		

Source: Computed by author based on daily closing prices from Google Finance

Table 2 depicts the test result of H_{03} (no significant difference in CANBK weekday return patterns pre- vs post-merger), pairwise two-sample t-tests were conducted (Table 2). All two-tailed p-values exceed 0.05 across weekday comparisons (range: 0.0741–0.9753), with t-statistics ranging from $t = -1.79$ to 0.03 (none exceeding t-critical = 1.965 at $\alpha = 0.05$). Therefore, H_{03} cannot be rejected; that is, no statistically

significant change exists in Canara Bank's weekday return patterns between pre-merger (2015-2020) and post-merger (2020-2025) periods.

iii) CANBK average weekday returns vs Nifty Bank Index average weekday returns

Table 3.1: Weekday return t-Tests (CANBK vs Nifty Bank Index) – pre-merger

t-Test: Two-Sample Assuming Unequal Variances (pre-merger period: 2015-2020)										
	CANBK Monday	Nifty Bank Monday	CANBK Tuesday	Nifty Bank Tuesday	CANBK Wednesday	Nifty Bank Wednesday	CANBK Thursday	Nifty Bank Thursday	CANBK Friday	Nifty Bank Friday
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Variance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Observations	244.00	244.00	246.00	246.00	247.00	247.00	247.00	247.00	244.00	244.00

Hypothesized Mean Difference	0.00	0.00	0.00	0.00	0.00
df	377.00	335.00	316.00	370.00	351.00
t Stat	-0.48	-0.38	-0.11	-0.83	-0.41
P(T<=t) one-tail	0.32	0.35	0.46	0.20	0.34
t Critical one-tail	1.65	1.65	1.65	1.65	1.65
P(T<=t) two-tail	0.63	0.70	0.91	0.41	0.68
t Critical two-tail	1.97	1.97	1.97	1.97	1.97

Source: Computed by author based on daily closing prices from Google Finance

Table 3.2: Weekday return t-Tests (CANBK vs Nifty Bank Index) – post-merger

t-Test: Two-Sample Assuming Unequal Variances (post-merger period: 2020-2025)										
	CANBK Monday	Nifty Bank Monday	CANBK Tuesday	Nifty Bank Tuesday	CANBK Wednesday	Nifty Bank Wednesday	CANBK Thursday	Nifty Bank Thursday	CANBK Friday	Nifty Bank Friday
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Variance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Observations	243.00	243.00	248.00	248.00	245.00	245.00	251.00	251.00	242.00	242.00
Hypothesized Mean Difference	0.00		0.00		0.00		0.00		0.00	
df	388.00		383.00		373.00		401.00		378.00	
t Stat	0.04		-0.01		0.87		0.68		0.41	
P(T<=t) one-tail	0.48		0.50		0.19		0.25		0.34	
t Critical one-tail	1.65		1.65		1.65		1.65		1.65	
P(T<=t) two-tail	0.97		0.99		0.39		0.50		0.68	
t Critical two-tail	1.97		1.97		1.97		1.97		1.97	

Source: Computed by author based on daily closing prices from Google Finance

Table 3.1 and 3.2 presents pairwise t-tests between Canara Bank stock returns and Nifty Bank Index returns across weekdays from 2015 to 2025. All two-tailed p-values exceed 0.05 in both periods (pre-merger range: 0.4057–0.9129; post-merger: 0.3856–0.9916), failing to reject H0. No significant weekday-specific differences exist between CANBK and the Nifty Bank index. This suggests that CANBK weekday return patterns are in line with that of the Nifty Bank index weekday return pattern.

5. Discussion and Implications

The empirical results indicate that there is no statistically significant day-of-the-week effect in CANBK or Nifty Bank over the sample period, and no significant change in CANBK’s weekday return pattern after the merger. This has several implications. First, the absence of a day-of-the-week anomaly supports weak-form market efficiency with respect to this anomaly. For these banking stocks, past weekday price patterns do not help predict future returns in a way that yields abnormal profits. This is consistent with EMH, which expects that once an anomaly becomes known and easy to exploit, competition among investors reduces the arbitrage opportunities.

Second, the findings differ from some earlier Indian studies that reported significant Monday and Friday effects in broad market indices and certain size-based portfolios. One possible explanation is that over time, as markets have matured, technology improved, and institutional participation increased, such simple calendar patterns have become less exploitable, especially in large, liquid banking stocks and indices. Both CANBK and Nifty Bank are highly traded, which may contribute to faster information incorporation and the disappearance of basic timing opportunities.

Third, sector-level evidence in the literature has always been mixed for banking. Some studies have found Monday effects in specific banks, while others have not observed significant weekday patterns in banking indices. The current results are more in line with those that report no day-of-the-week effect in banking indices and suggest that the Indian banking segment may now behave more efficiently, at least with respect to this particular anomaly.

Fourth, the merger between Canara Bank and Syndicate Bank does not appear to have introduced a new day-of-the-week pattern. While mergers can change size, risk and investor perception, any such changes did not translate into systematic weekday return differences in the post-merger period. This can suggest that the market quickly absorbed the merger information, causing no opportunities to exploit based on weekdays alone.

Overall, the study confirms the idea that not all anomalies found in earlier periods or in other contexts will hold in current data or specific sectors. For practitioners, this means that relying on simple “buy Monday, sell Friday” strategies in CANBK or Nifty Bank is unlikely to yield reliable excess returns. Hence, attention may be better focused on fundamentals, risk management and broader portfolio construction rather than on basic weekday timing strategies in large banking stocks. For regulators and policymakers, the results are consistent with an increasingly efficient market environment in which obvious arbitrage opportunities are not easily found in highly traded banking assets.

6. Conclusion

This paper tested for the day-of-the-week effect in the daily returns of Canara Bank and the Nifty Bank index and examined whether the pattern changed after the amalgamation of Syndicate Bank into Canara Bank. Using

one-way ANOVA and independent samples t-tests on daily stock returns, the study found no statistically significant day-of-the-week effect in either CANBK or Nifty Bank index. There is no significant difference in weekday returns before and after the merger, and no significant difference between CANBK and Nifty Bank mean returns.

These findings support weak-form efficiency with respect to the day-of-the-week anomaly in the Indian banking segment over the sample period and suggest that simple calendar-based trading strategies are unlikely to be profitable in these securities. Investors should avoid simple weekday timing strategies in CANBK and Nifty Bank, as they yield no reliable excess returns. They should focus instead on fundamentals, risk management, and portfolio construction. The results indicate no obvious arbitrage opportunities for regulators and policymakers.

7. Limitations and Scope for Future Research

The study has some limitations. It focuses on one public sector bank and one sectoral index; results may differ for smaller or less liquid banking stocks. The analysis uses daily closing prices. Intraday data could reveal short-lived patterns that are not visible at the daily frequency.

Future research can extend this work by:

- Including more individual banking stocks (public and private) for comparison.
- Using intraday data to examine high-frequency patterns.
- Studying other anomalies (e.g., month-of-the-year, holiday effects) jointly with the day-of-the-week effect for CANBK and related banks.

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Author Contributions

- Mokshitha Dirisala (sole author): 100% contribution across conceptualisation, methodology, data collection (Google Finance), analysis (ANOVA/t-tests), writing, and revisions.
- Dr. Raghavendra K.S. (Guide): Provided academic supervision through feedback on methodology, results interpretation, and manuscript structure.

Conflict of Interest

The author declares that there is no conflict of interest related to this research work. The study was conducted independently, and no personal or financial relationships could have appeared to influence the results and interpretations presented in this paper.

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