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Market Structure and Manipulation Risk in India's Derivatives Segment: A Leverage-Multiplier Framework Applied to the Jane Street Case

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ABSTRACT

India's equity derivatives segment has become the largest in the world by contract volume, and by late 2024 its notional turnover reached roughly 400 times that of the cash market, a ratio that fell to around 300 times by early 2025 after regulatory intervention. On a premium basis, a more economically meaningful measure of actual capital at risk, the same ratio was only about 0.5 to 0.6 times, a distinction this paper argues is essential and frequently blurred. This paper documents two mechanically distinct strategies alleged in SEBI's 2025 interim order against Jane Street Group, the Intraday Index Manipulation pattern and the Extended Marking the Close variant, and develops a leverage-multiplier framework connecting the cost of moving an underlying index through cash-and-futures trading to the profit available on a derivatives position sized against that move. Three estimates of this multiplier are computed under increasingly precise assumptions: a naive headline figure of approximately 9.9, a per-day average of approximately 0.55 once the alleged profit is spread evenly across the eighteen expiry days SEBI cites, and a precisely matched same-day estimate of approximately 11.9 once cost is correctly measured as net trading loss rather than notional capital deployed. This range illustrates how sensitive a headline manipulation-profitability figure is to measurement choices that are rarely made explicit. The paper situates the case within a longer history of Indian market manipulation dating to 1992, extends the framework qualitatively using price-impact theory, and classifies both SEBI's six-measure 2024-25 reform package and its informant mechanism against the framework developed here. It concludes that measures targeting notional exposure on the derivatives side are better matched to the mechanism this paper describes than cash-side cost increases alone.

Keywords: market manipulation; derivatives-to-cash ratio; index options; trade-based manipulation; price impact; SEBI; Indi

1. Introduction

Over the past five years, India's exchange-traded equity derivatives segment has grown from a large but ordinary market into the biggest derivatives market in the world by contract volume. Much of this growth has come from weekly index options, contracts with a short life and a payoff structure that rewards a large, sudden move in the underlying index far more than it rewards a small one. That structural fact matters for reasons beyond the retail losses this growth has produced, which earlier work in this research programme has documented in detail. It also matters for market integrity, because a derivatives market that is very large relative to the cash market it references creates a specific kind of opportunity: a participant who can move the cash-and-futures price by a modest amount, at a modest cost, may be able to capture a much larger gain on a pre-positioned options book that pays off on exactly that move.

This is precisely the pattern the Securities and Exchange Board of India (SEBI) alleged against Jane Street Group in its interim order of July 2025. Regardless of how that matter is ultimately resolved, the allegations offer a rare, numerically specific illustration of a mechanism that market manipulation theory has described for decades but that is unusually difficult to quantify with real figures. This paper takes SEBI's own alleged numbers and asks a narrower, more tractable question than whether manipulation occurred: given the market structure India actually has, how large would the payoff from this kind of pattern need to be relative to its cost, how sensitive is that figure to reasonable changes in assumption, and what does the answer imply for how regulators should design a response?

The paper makes seven contributions. It documents, in technical detail, the two mechanically distinct strategies SEBI's order alleges, the Intraday Index Manipulation pattern and the Extended Marking the Close variant, including the risk-reversal options construction each relies on. It develops a transparent leverage-multiplier framework connecting cash-side cost to derivatives-side profit. It computes this multiplier three separate ways, a naive full-period estimate, a per-day average, and a precisely matched same-day estimate that corrects a notional-versus-net-cost conflation present in the naive version, showing the three estimates span a range from below breakeven to nearly twelve times cost. It extends the framework qualitatively using established price-impact theory to explain why the alleged scheme targeted large, liquid stocks rather than smaller ones. It situates the Jane Street case within a longer history of Indian market manipulation stretching back to the 1992 securities scam. It classifies both SEBI's six-measure reform package

and its informant mechanism against the framework, asking which measures address which side of the leverage ratio and which address detection rather than cost. And it draws an explicit distinction between the notional and premium bases on which India's derivatives-to-cash ratio is measured, correcting an ambiguity present in some of the authors' earlier work on this subject.

2. Literature Review

2.1. Theories of market manipulation

The modern theoretical literature on market manipulation begins with Allen and Gale (1992), who classified manipulation into three types: information-based manipulation, which relies on spreading false or misleading information; action-based manipulation, which relies on actions that change the real or perceived value of the underlying asset; and trade-based manipulation, in which a trader profits purely from the act of buying and selling, without any accompanying false statement or real economic action. Trade-based manipulation is the most difficult of the three to detect and prosecute, precisely because every individual trade in the pattern can be entirely legal in isolation. Kyle (1985) provides the foundational formal model of how a strategic trader's activity moves prices in the presence of market makers and noise traders, a framework later authors extended specifically to manipulation.

Aggarwal and Wu (2006) extend the Allen and Gale framework and provide empirical evidence from SEC enforcement actions, finding that manipulators are typically informed parties such as insiders or brokers, that prices rise through the manipulation period and fall afterward, and that manipulation tends to increase both volatility and trading volume. This pattern, a price run-up followed by a reversal once the manipulative position is unwound, maps closely onto the two-part morning-and-afternoon structure SEBI alleged in the Jane Street case.

2.2. Closing-price and expiry-day manipulation

A related strand of literature focuses specifically on manipulation concentrated around a known, fixed pricing event, such as the close of trading or the expiry of a derivatives contract. Hillion and Suominen (2004) study the manipulation of closing prices directly, and Comerton-Forde and Putnins (2011) develop a formal index for measuring the probability and intensity of closing-price manipulation. Chow, Hung, Liu and Shiu (2013) examine expiration-day effects and manipulation specifically in Taiwan's derivatives market, a market structurally similar to India's in that a single index underlies a very large options market. This literature is directly relevant here because SEBI's own reform package, discussed in Section 3.6, treats expiry-day activity as the specific point of greatest concern, not derivatives trading in general.

Within the Indian market specifically, Chaturvedula, Bang, Rastogi and Kumar (2015) study price manipulation, front-running and bulk trades using Indian data and find evidence consistent with the broader trade-based manipulation literature. That paper predates the weekly-options boom this paper is concerned with by several years, and no published academic study has yet examined a manipulation episode of the scale and specificity SEBI alleges in the Jane Street matter.

2.3. Manipulation surveillance and regulatory design

A separate literature addresses not how manipulation occurs but how regulators can deter or detect it. Position limits, caps on the size of a derivatives position any single participant may hold, are among the oldest tools in this area and are used extensively by the US Commodity Futures Trading Commission for exactly this purpose. Real-time surveillance systems that flag unusual patterns of coordinated cash and derivatives activity around expiry are a newer, technology-dependent complement to position limits. Both approaches share a common logic with the framework developed in Section 4 of this paper: they aim to raise the cost, or lower the feasible scale, of the derivatives-side position a manipulator can establish, rather than relying solely on making the cash-side trading itself more expensive. Execution-cost theory, most notably Almgren and Chriss (2000), provides the underlying model of how the cost of moving a price through trading scales with trade size, a relationship this paper draws on qualitatively in Section 4.4 to explain why liquid, large-capitalisation stocks are the natural target for a cash-side manipulative leg.

3. Institutional Background

3.1. A history of manipulation in Indian equity markets

The Jane Street case is not the first time Indian equity markets have faced a manipulation episode large enough to force a regulatory response. The 1992 securities scam, in which stockbroker Harshad Mehta diverted funds estimated at approximately Rs 4,000 to 5,000 crore from the interbank government securities market into equity speculation using forged bank receipts, is generally credited with forcing the transformation of SEBI from a body with limited powers into a full statutory regulator under the SEBI Act, 1992. The Ketan Parekh episode of 2000-01 is closer in kind to the pattern this paper examines: Parekh allegedly used circular trading and bank financing, drawn substantially from Madhavpura Mercantile Cooperative Bank, to inflate the prices of a set of ten thinly traded technology and media stocks known as the 'K-10' stocks, a scheme unwound when the dot-com crash removed the financing that sustained it. Estimates of the direct fraud in the Ketan Parekh case range from approximately Rs 1,200 crore to a considerably larger figure exceeding Rs 40,000 crore cited by India's Serious Fraud Investigation Office, a range that likely reflects the same kind of methodological difference, direct fraud versus total market impact, that Section 3.2 discusses for the notional-versus-premium distinction in today's derivatives market. The Satyam Computer Services case of 2009, by contrast, was an information-based rather than trade-based manipulation in the Allen and Gale (1992)

taxonomy: chairman Ramalinga Raju falsified the company's accounts over several years, inflating revenues, profits and cash balances by an amount subsequently estimated at approximately Rs 7,800 crore, with no requirement to move a market price through trading at all.

Table 1 places these three historical cases alongside the Jane Street allegations, classified by manipulation type. Figure 1 plots the estimated scale of each case, on a logarithmic axis given the range involved, and shows the alleged Jane Street profit figure as an order of magnitude larger than any of the three historical comparators, consistent with the scale of growth in the derivatives market itself described in Section 3.2.

Table 1 - Major manipulation and fraud cases in Indian equity markets, 1992-2025.

Case (year)	Allen-Gale type	Estimated amount	Regulatory response
Harshad Mehta (1992)	Trade-based	Rs 4,000-5,000 cr	SEBI Act, 1992; statutory powers; demat, rolling settlement
Ketan Parekh (2001)	Trade-based	Rs 1,200 cr (direct); Rs 40,000+ cr (SFIO estimate)	Badla abolition; circular-trading curbs
Satyam (2009)	Information-based	Rs 7,800 cr	Corporate governance reform; audit oversight
Jane Street (2025, alleged)	Trade-based	Rs 43,289 cr (alleged)	Six-measure reform package (Section 3.6)

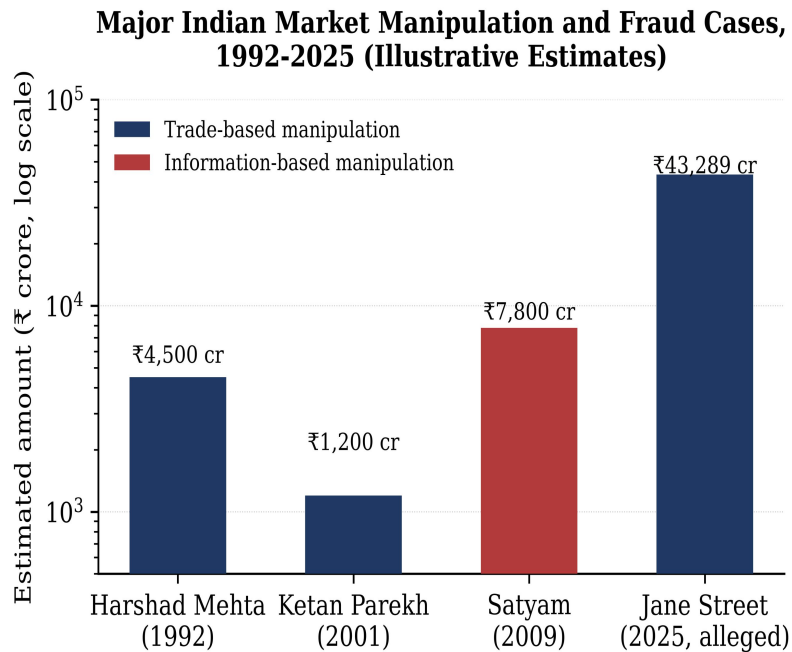


Fig. 1 - Estimated scale of major Indian market manipulation and fraud cases, 1992-2025, log scale.

3.2. India's derivatives market structure

India's equity derivatives market is regulated by SEBI under the Securities Contracts (Regulation) Act, 1956 and the SEBI Act, 1992, with the National Stock Exchange and Bombay Stock Exchange as the two principal venues. The market's defining structural feature is the size of its derivatives segment relative to its cash segment. On a notional basis, the value implied by outstanding options contracts, this ratio reached approximately 400 times in November 2024 before declining to roughly 300 times by February 2025 following SEBI's reform measures. On a premium basis, the actual cost of the options traded rather than the notional value they reference, the ratio is far smaller, on the order of 0.5 to 0.6 times over the same period. Both figures are real and both are published by SEBI and NSE; they answer different questions. The notional ratio describes how much economic exposure the derivatives market references relative to the cash market. The premium ratio describes how much money actually changes hands. This distinction matters for manipulation risk specifically because it is the notional ratio, not the premium ratio, that determines how much leveraged exposure a trader can accumulate relative to the cost of moving the underlying.

3.3. The Jane Street case

On 3 July 2025, SEBI issued an interim order against Jane Street Group and related entities, alleging a manipulative trading pattern in Bank Nifty index derivatives repeated on at least eighteen expiry days between January 2023 and March 2025. The alleged pattern had two parts within a single trading day. In the morning session, the entities allegedly conducted aggressive buying of Bank Nifty constituent stocks and futures, worth approximately Rs 4,370 crore on the illustrative date SEBI examined in detail (17 January 2024), which pushed the index level upward. Simultaneously, the entities allegedly built a large bearish options position, buying puts and selling calls, sized to profit from a subsequent decline. In the afternoon session, the entities allegedly reversed the morning's cash and futures purchases, contributing to a decline in the index level, a decline on which the bearish options position paid off. SEBI's order states that this pattern generated alleged profits exceeding Rs 43,289 crore, of which Rs 4,843 crore was directed to be impounded pending further proceedings. The amount was deposited into an escrow account on 14 July 2025, and trading privileges were restored subject to conditions on 21 July 2025. Jane Street has contested the allegations, and the matter remains before the relevant authorities; nothing in this paper should be read as an independent finding on the merits.

3.4. The Intraday Index Manipulation strategy: technical mechanics

SEBI's order identifies two distinct alleged strategies, not one. The first, which SEBI's own order terms the 'Intraday Index Manipulation' strategy, was identified on fifteen of the eighteen expiry days examined, including the illustrative date of 17 January 2024. The mechanics, as alleged, work as follows. In the opening hour of trading on an expiry day, the entities purchased Bank Nifty constituent stocks and index futures in large volume, pushing the index level upward. On 17 January 2024 specifically, this leg amounted to approximately Rs 4,370 crore in futures and constituent-stock purchases. Simultaneously, as the index rose and index put options consequently became cheaper to buy while call options became more expensive to sell, the entities allegedly built a large short options position, selling Bank Nifty options worth approximately Rs 32,115 crore that same morning, reaching a peak short options exposure of approximately Rs 46,620 crore. In options terms, buying puts while selling calls as the underlying rises constructs a risk reversal, a combined position whose payoff depends not only on the index's direction (its delta) but on how implied volatility differs across strikes (its skew), and, given this was executed in weekly, same-day-expiry contracts, on the sharp time decay such contracts carry. This is a materially more sophisticated construction than a simple directional bet, and SEBI's order specifically notes the strategy was 'vol- and skew-sensitive' rather than purely directional.

In the afternoon session, the entities allegedly reversed the morning's cash and futures purchases, selling aggressively enough to push the index back down into the close, a technique generally known in market-manipulation literature as marking the close (Hillion & Suominen, 2004). Because the short options position was sized against exactly this kind of decline, the reversal allegedly generated a large profit on the options book. On 17 January 2024, SEBI's order states the options-side profit was approximately Rs 734.93 crore, while the cash-and-futures leg registered a net intraday loss of approximately Rs 61.6 crore, the difference between the price at which the morning's stocks and futures were bought and the lower price at which they were sold back in the afternoon. This distinction matters for the framework in Section 4: the Rs 4,370 crore figure is the notional value of stock and futures purchased, the capital temporarily deployed, not the cost actually borne, which was the much smaller net trading loss of Rs 61.6 crore on the round trip. Section 4.6 returns to this distinction and recomputes the leverage multiplier using the correctly matched same-day figures.

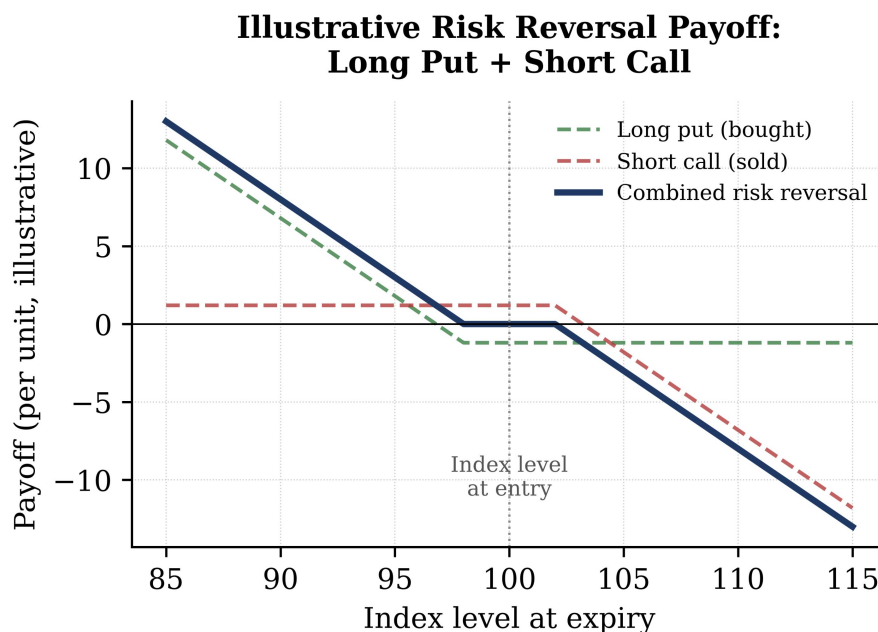


Fig. 2 - Illustrative combined payoff of a long put and a short call (a risk reversal), the options construction SEBI's order alleges. The position gains as the index falls and loses as it rises, the opposite of a simple long position in the index.

Figure 2 illustrates why this construction is described as vol- and skew-sensitive rather than purely directional. Away from the two strike prices, the combined position behaves much like a short position in the index itself, gaining as the index falls and losing as it rises. Near the strikes, however, its sensitivity to a further move (its delta) changes at a different rate than a simple short index position would, and its value responds to changes in implied volatility and to the skew between put and call implied volatilities in a way a linear position does not. Executed in same-day-expiry contracts, this construction also carries the sharp time decay characteristic of options in the final hours before expiry, which is precisely the window in which SEBI alleges the afternoon reversal took place.

3.5. The Extended Marking the Close strategy

The second alleged strategy, which SEBI's order terms 'Extended Marking the Close', appears on three of the eighteen days, including 10 July 2024 and a cluster of days in May 2025. Where the Intraday Index Manipulation strategy spans a full trading day, morning accumulation followed by afternoon reversal, the Extended Marking the Close variant concentrates entirely on the final one to two hours before expiry-day settlement. On 10 July 2024, SEBI's order states the entities aggressively sold Bank Nifty futures worth approximately Rs 2,800 crore in this window while holding a short options position of approximately Rs 44,154 crore, pushing the settlement price down to benefit the pre-existing short options book. In the May 2025 instances, the direction reversed: the entities aggressively bought Nifty futures and constituent stocks worth approximately Rs 4,911 crore in the closing window, consistent with a short-dated options position sized to profit from a late upward move instead. The common mechanism across both variants, and across both directions, is the same: a position in the far more liquid options market, sized well beyond what the cash-and-futures leg could support on its own capital, combined with trading late in the session specifically timed to influence the reference price used for settlement. Table 2 compares the two strategies directly.

Table 2 - The two alleged strategies compared.

Feature	Intraday Index Manipulation	Extended Marking the Close
Days identified	15 of 18	3 of 18
Window of activity	Full session (morning and afternoon)	Final 1-2 hours before settlement only
Cash/futures action	Buy in morning, sell in afternoon	One-directional, late-session only
Options construction	Risk reversal (long puts, short calls)	Pre-positioned short or long options book
Illustrative date	17 Jan 2024	10 Jul 2024; May 2025 (3 days)
Illustrative cash/futures figure	Rs 4,370 cr (futures bought)	Rs 2,800 cr (futures sold, 10 Jul 2024)

3.6. SEBI's 2024-25 reform package

In response to the loss patterns documented in its own studies of retail traders, and to broader concerns about derivatives market structure, SEBI introduced a six-measure reform package effective from October 2024 through April 2025. Table 3 lists each measure and classifies it according to the leverage-multiplier framework developed in Section 4: whether it primarily raises the cost of establishing a large derivatives position (targeting the profit side, P, of the ratio), the cost of cash-side trading (targeting the cost side, C), or neither directly.

Table 3 - SEBI's six reform measures, classified against the leverage-multiplier framework.

Measure	Effective	Primarily targets
Higher minimum contract size	Nov 2024	P (raises cost per unit of notional exposure)
Single weekly index expiry per exchange	Nov 2024	P (reduces expiry-day concentration opportunities)
Expiry-day Extreme Loss Margin surcharge	Nov 2024	P (raises cost of holding derivatives into expiry)
Removal of calendar-spread margin benefit	Feb 2025	P (raises effective margin on expiry-day structures)
Upfront collection of options premium	Feb 2025	P (limits leveraged options accumulation)
Intraday position-limit monitoring	Apr 2025	P (caps derivatives position size directly)

On this classification, all six measures target the derivatives side of the ratio; none directly raises the cost of cash-and-futures trading itself. Section 5 returns to this observation and connects it explicitly to the sensitivity results in Section 4.3.

3.7. Positive institutional responses: the informant mechanism

Alongside capacity-based measures such as those in Table 3, SEBI has also built institutional capacity to detect manipulation and insider trading before it reaches the scale of the cases in Table 1. On 26 December 2019, SEBI added Chapter IIIA to the SEBI (Prohibition of Insider Trading) Regulations, 2015, formally establishing an Informant Mechanism and an independent Office of Informant Protection. Under this framework, an individual with credible, original information about insider trading can submit a Voluntary Information Disclosure Form, have their identity kept confidential from the accused throughout the process, and receive a monetary reward, set at 10 percent of the monetary sanction recovered, where the information leads to a disgorgement of at least Rs 1 crore. This is a structurally different response to manipulation risk than the position-limit and margin measures discussed above: rather than raising the cost of establishing a position, it raises the probability that a scheme is detected while it is still in progress, by giving insiders and counterparties a direct financial incentive to report what they observe. Whether such a mechanism would have surfaced a pattern of the kind alleged in the Jane Street case, which did not obviously depend on any single insider's cooperation to execute, is a separate question this paper does not attempt to answer, but the mechanism is a genuine complement to the capacity-based measures in Table 3 rather than a substitute for them.

3.8. Jane Street's defence: index arbitrage or manipulation?

Fairness to the framework this paper develops requires stating Jane Street's own position clearly rather than only SEBI's. Jane Street has denied wrongdoing and has characterised its trading as a form of index arbitrage: cash-settled Bank Nifty index options are considerably more liquid than the twelve underlying constituent stocks combined, and price discrepancies between the options-implied level of the index and its cash-market level can, in principle, be closed by trading both legs, precisely the kind of activity that keeps derivatives prices aligned with their underlying and that many participants undertake daily without any manipulative intent. On this account, the morning purchases were a legitimate hedge against the options position rather than a device to inflate the index artificially, and the afternoon reversal simply unwound that hedge as the position matured toward expiry.

Two features of SEBI's order are what push the allegation from ordinary arbitrage toward manipulation in the regulator's account, and both are worth stating precisely rather than left implicit. First, the scale asymmetry: SEBI's order emphasises that the options-side exposure, in the tens of thousands of crore, dwarfed what would be needed merely to hedge the morning's cash-and-futures purchases, suggesting the cash-side trade was sized to move the index rather than merely to track it. Second, the timing concentration: ordinary arbitrage activity would not obviously need to cluster so heavily in the final hour before an expiry-day settlement specifically, the pattern that gives the Extended Marking the Close strategy in Section 3.5 its name. Whether these two features are sufficient to distinguish unlawful manipulation from aggressive but lawful arbitrage is precisely the legal question now before the relevant authorities, and this paper, as stated throughout, does not purport to resolve it. What the leverage-multiplier framework in Section 4 offers is orthogonal to that legal question: it quantifies the scale of profit the alleged pattern would generate relative to its cost under either characterisation, since the arithmetic of the trades themselves does not depend on which label is ultimately applied to them.

4. A Leverage-Multiplier Framework

4.1. Model setup

Consider a trader who spends an amount C in the cash-and-futures market to move an underlying index by a given amount over a trading session, and who holds, before that session begins, a derivatives position sized to profit from exactly that move. Denote the profit realised on that derivatives position P . Define the realised leverage multiplier as

$$LM = P / C \quad (1)$$

This is a deliberately simple ratio. It does not model the price-impact function linking cash-side trading to a given index move, nor the options market's depth directly. It takes two figures a regulator or researcher can usually observe after the fact, the cost of the cash-side activity and the profit on the derivatives side, and asks how large the second was relative to the first. A multiplier above one means the derivatives-side profit exceeded the cash-side cost; a multiplier below one means it did not, in which case the pattern would not have been profitable on these two legs alone.

4.2. Applying the framework to the Jane Street allegations

Using SEBI's own alleged figures, C is approximately Rs 4,370 crore and P exceeds Rs 43,289 crore, giving a headline realised leverage multiplier of approximately 9.9. Every rupee of alleged cash-and-futures cost was associated with almost ten rupees of alleged options profit, on these figures.

4.3. Sensitivity to cash-side cost

A useful question for policy purposes is how much higher cash-side costs would need to be before this kind of pattern stopped being attractive. Table 4 reports the leverage multiplier at various multiples of the actual alleged cash-side cost, holding the alleged profit figure fixed.

Table 4 - Leverage multiplier at higher assumed cash-side cost.

Cost multiple	Implied cash cost (Rs cr)	Leverage multiplier
1x (actual)	4,370	9.91x
2x	8,740	4.95x
3x	13,110	3.30x
5x	21,850	1.98x
7x	30,590	1.42x
10x	43,700	0.99x

Figure 3 plots this relationship across a continuous range.

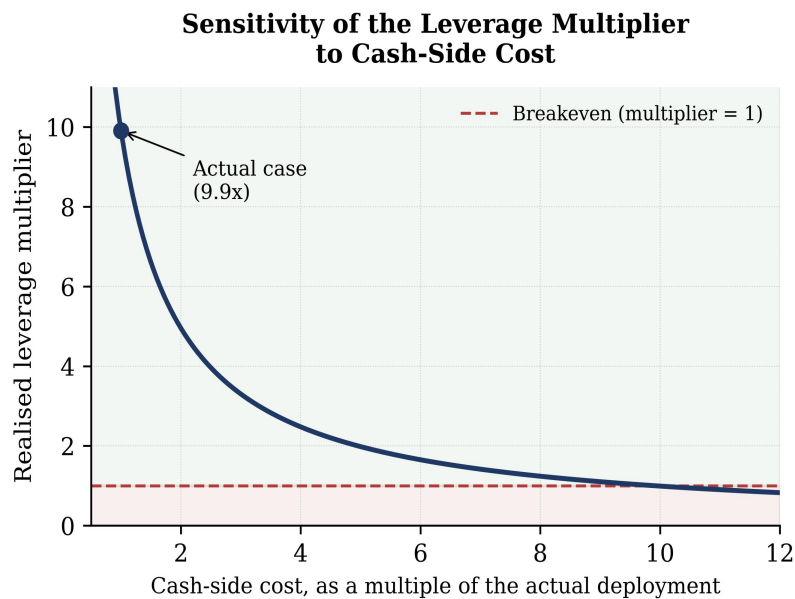


Fig. 3 - Leverage multiplier as a function of cash-side cost, relative to the actual alleged cost.

On these figures, cash-side costs would need to rise to roughly ten times their actual alleged level before the pattern would reach breakeven on these two legs alone, purely on the single-date arithmetic examined here. Section 4.5 shows this picture changes substantially once the multi-day nature of the alleged scheme is taken into account.

4.4. Why liquid, large-capitalisation stocks minimise the cost side

Execution-cost theory, following Almgren and Chriss (2000), models the cost of moving a security's price through trading as increasing with trade size but at a decreasing rate relative to the security's typical trading volume; moving a highly liquid stock's price by a given percentage generally costs less, per unit of capital deployed, than moving a thinly traded stock's price by the same percentage, because liquid stocks can absorb larger orders without the price moving as much per rupee traded. This is a qualitative application of a well-established principle, not a fitted estimate specific to this case, since the order-book data needed to fit such a model is not available in the public record. It nonetheless offers a coherent explanation for why the alleged scheme concentrated its cash-side activity in Bank Nifty constituents specifically: these are among the most liquid large-capitalisation stocks in the Indian market, and a given percentage move in the index would be cheaper to engineer through these stocks than through a less liquid, smaller basket. The choice of underlying is therefore not incidental to the mechanism this paper describes; it is close to what the mechanism would predict a cost-minimising actor to choose.

4.5. Robustness to the multi-day averaging assumption

The headline multiplier in Section 4.2 combines a single-day cash-cost estimate, since SEBI's order provides its most granular cash-side figures for the single illustrative date of 17 January 2024, with an aggregate profit figure spanning the full alleged period of at least eighteen expiry days. This mismatch is a genuine limitation, and it is worth confronting directly rather than leaving it as a caveat. If the alleged aggregate profit of Rs 43,289 crore is instead spread evenly across the eighteen expiry days SEBI cites, the average alleged profit per expiry day is approximately Rs 2,405 crore.

Measured against the same Rs 4,370 crore single-day cash cost, this gives a per-day leverage multiplier of approximately 0.55, below the breakeven threshold of one.

This does not mean the alleged scheme was unprofitable; it means the simple even-split assumption is probably wrong in one of two directions. Either the cash-side cost was smaller on most of the other seventeen days than on the illustrative date SEBI examined in detail, which would restore a multiplier above one on those days, or the per-day profit was uneven, concentrated on a smaller number of days with larger moves. Section 4.6 shows that the first of these two possibilities is, in fact, closer to the truth.

4.6. A precisely matched single-day estimate

Section 3.4 distinguished between the Rs 4,370 crore notional value of stocks and futures purchased on 17 January 2024 and the much smaller Rs 61.6 crore net loss actually realised on that leg once the morning's purchases were reversed in the afternoon. This distinction resolves the mismatch identified in Section 4.5. The Rs 43,289 crore aggregate profit figure spans the full alleged period and should not be divided by a single day's notional exposure; but SEBI's order does provide same-day figures for both legs on 17 January 2024 specifically: an options-side profit of approximately Rs 734.93 crore against a cash-and-futures net loss of approximately Rs 61.6 crore. Using these correctly matched, same-day figures, the leverage multiplier for 17 January 2024 alone is

$$LM(17 \text{ Jan } 2024) = 734.93 / 61.6 \approx 11.9 \quad (2)$$

This is higher than the headline naive estimate of 9.9 in Section 4.2, not lower, because the true cash-side cost, the net trading loss on the round trip, was far smaller than the notional value of capital temporarily deployed to move the index. Table 5 summarises all three estimates produced in this paper side by side.

Table 5 - Three leverage-multiplier estimates compared.

Method	Profit (Rs cr)	Cost (Rs cr)	Multiplier
Naive (Sec. 4.2): aggregate profit / single-day notional	43,289 (18-day total)	4,370 (notional)	9.91x
Per-day average (Sec. 4.5): even split / single-day notional	2,405 (per-day avg.)	4,370 (notional)	0.55x
Precisely matched (Sec. 4.6): same-day profit / same-day net cost	734.93 (17 Jan only)	61.6 (17 Jan only)	11.93x

The lesson is not that any single one of these three numbers is the correct multiplier; it is that the multiplier is highly sensitive to whether cost is measured as notional capital deployed or as net trading loss, and to whether profit and cost are measured over matching time windows. The precisely matched estimate in this section is the most methodologically defensible of the three, since it compares like with like on the one day for which SEBI's order provides sufficiently granular figures on both legs, and it suggests the true incentive this paper describes may be understated, not overstated, by the paper's own headline figure. Applying the same correction to the other seventeen alleged days would require cash-side net-loss figures the public record does not currently provide.

5. Reading the Reform Package Through the Framework

Section 3.6 classified all six of SEBI's 2024-25 reform measures as primarily targeting the derivatives side of the leverage ratio, P, rather than the cash-trading side, C. Section 4.3 showed that cash-side costs would need to rise roughly tenfold to neutralise the specific case examined here on a naive single-day basis, a very large margin for any single cash-side measure, such as a securities transaction tax increase, to close on its own. Read together, these two findings are mutually reinforcing rather than contradictory: because cash-side cost increases would need to be very large to matter, and because SEBI's actual measures instead concentrate on raising the cost or capping the scale of the derivatives-side position, the regulatory design is, on this framework, better matched to the mechanism than an equivalent set of cash-side measures would have been.

This reading also suggests a specific direction for future measures, should the loss and manipulation patterns documented in this research programme persist. Because Section 4.5 shows that day-by-day variation in the alleged pattern's profitability is likely substantial, surveillance measures capable of distinguishing an unusually large single-day options position from routine trading, rather than blanket position limits applied uniformly across all days, may offer a more targeted complement to the capacity-based measures SEBI has already introduced.

6. Discussion

The leverage-multiplier framework developed here is not a test for manipulation and cannot substitute for the evidentiary and legal standards that determine whether a given trading pattern is unlawful. What it offers is a way to connect a market's structural features, specifically the gap between its notional derivatives-to-cash ratio and its premium-based ratio, to the scale of incentive that structure creates for a pattern of the kind SEBI has alleged. A market where the notional ratio is high but the premium ratio is modest is a market where a comparatively small amount of capital, deployed to move

the underlying, can be paired with a comparatively large derivatives position, because that large notional exposure did not require a correspondingly large premium outlay to establish.

It is also worth restating what this framework does not show, given the robustness results in Sections 4.5 and 4.6. A high headline leverage multiplier is a necessary feature of a profitable trade-based manipulation scheme on any given day, but it is not sufficient evidence that one occurred, and it is not even a stable single number: this paper's own three estimates, in Table 5, range from 0.55 to 11.93 depending on how cost and profit are matched and measured. A large, correctly directional bet on index movement driven by genuine information or analysis could produce an identical single-day ratio without any manipulative intent. The multiplier developed here measures the scale of what was structurally possible and, on SEBI's own alleged figures for the one date examined in most detail, apparently realised at a multiple even larger than this paper's original headline estimate once cost is measured correctly. Whether the broader trading pattern that produced it, across all eighteen alleged days, was lawful is a separate question this paper does not and cannot resolve.

7. Limitations

Several limitations qualify these findings. The price-impact discussion in Section 4.4 is qualitative; it applies a general, well-established principle rather than a fitted model calibrated to Bank Nifty-specific order-book data, which is not available in the public record. The robustness checks in Sections 4.5 and 4.6 rely on the single illustrative date of 17 January 2024 for the only same-day cost-and-profit pair SEBI's order discloses in enough detail to compute a precisely matched multiplier; the other seventeen alleged days could behave very differently, and the public record does not permit extending the Section 4.6 calculation to them. The allegations underlying the case study are, at the time of writing, contested and unresolved, and this paper's use of SEBI's figures should not be read as an endorsement of their accuracy or an independent finding on the merits. Finally, the notional-versus-premium distinction in Section 3.2, while well documented in SEBI and NSE data, is drawn from a small number of published data points around late 2024 and early 2025, and the two ratios could behave differently over a longer horizon.

8. Conclusion

This paper has developed a leverage-multiplier framework connecting the cost of moving an underlying index to the profit available on a derivatives position sized against that move, and applied it to SEBI's alleged Jane Street figures under three different, increasingly precise measurement approaches. The naive headline multiplier of approximately 9.9, computed by dividing the full-period alleged profit by a single day's notional cash-side exposure, falls to approximately 0.55 once that same profit is instead spread evenly across the eighteen expiry days SEBI cites, but rises to approximately 11.9 once cost and profit are both measured over the same single day and cost is correctly defined as the net trading loss on the round trip rather than the notional value of capital temporarily deployed. This range, from below breakeven to nearly twelve times cost, illustrates how much a headline manipulation-profitability figure depends on measurement choices that are rarely made explicit, and the precisely matched estimate, the most methodologically defensible of the three, suggests this paper's own original headline figure may have understated rather than overstated the incentive at stake. The paper has also documented two mechanically distinct alleged strategies, the Intraday Index Manipulation pattern and the Extended Marking the Close variant, extended the framework qualitatively using price-impact theory to explain the choice of liquid, large-capitalisation stocks as the manipulative leg, situated the case within a longer history of Indian market manipulation stretching back to 1992, and classified both SEBI's six-measure reform package and its informant mechanism against the framework developed here. Future work with access to day-by-day and order-level data could extend the Section 4.6 calculation to the other seventeen alleged days, resolving definitively whether the scheme's profitability was concentrated or evenly spread, a question the public record cannot currently answer.

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