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Fake team, real sponsors, unexpected returns: Prediction and stock market responses to authentic brand integration in F1 The Movie

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Prediction and stock market responses to authentic brand integration in *F1 The Movie*

The interface of marketing and finance in the literature has traditionally treated marketing-related announcements as an information event to be evaluated by investors, whose performance expectations are immediately reflected in the stock prices of affected firms. However, capturing market expectations and the financial impact when reality deviates from those expectations has historically been a rather crude science given that evolving expectations for marketing can be difficult to quantify, particularly within the noise of stock prices. Play-money markets such as the Hollywood Stock Exchange offered early glimpses of these expectations (Elberse 2007; Spann and Skiera 2003), and real-money prediction markets such as Kalshi and Polymarket now provide tangible, continuously updated measurements of expectations that were previously opaque (Wolfers and Zitzewitz 2004).

The event study in this paper examines a deviation in expected performance for a key marketing asset. Specifically, *F1 The Movie* was a summer blockbuster that grossed more than $540M globally in its first six weeks of release in 2025, making it the highest-grossing sports movie of all time (McClintock 2025a). Yet, on the eve of its U.S. release, industry tracking pointed to a domestic opening weekend of $40–50 million (McClintock 2025b), and traders on Polymarket, the popular prediction market that processed nearly $600,000 in contracts on the outcome, priced an opening above $55 million as roughly a coin flip. Moreover, the movie went far beyond typical product placement to realize an unexpected degree of authentic brand integration for sponsoring firms that enhanced the narrative reality. These two features, sponsors woven authentically into the story and a property that outperformed expectations, are distinct but related explanations for how investors might value the brands embedded in the film, and together

they make *F1 The Movie* a compelling setting in which to observe the interface of marketing and financial markets.

From the beginning, the stated goal of producers Jerry Bruckheimer and Lewis Hamilton was to create the most authentic racing movie ever produced. Researchers have deemed authenticity to be foundational to consumer engagement, particularly in sponsorship-linked marketing (Cornwell 2019; Charlton and Cornwell 2019). "F1's willingness to open the paddock doors to the film-makers on grand prix weekends helped provide a level of authenticity that hasn't been seen in other recent sports movies," noted the New York Times (Smith 2025 p. 4-5). "The fictional APXGP team simply became part of the real-world travelling circus, complete with its own garage setup and hospitality unit at select races across 2023 and 2024."

Even the sponsors were real. Actual brands, including several current F1 sponsors, were authentically integrated into the film's content, including branding on team liveries, firesuits, and on backdrops during a mock press conference (Stern 2023). To help offset the movie's reported $300 million budget, Apple, Warner Bros., and Jerry Bruckheimer Films generated $40 million in revenue from these sponsorships (Stern 2025a). Expensify, the title sponsor of Pitt's fictitious racing team, invested heavily in the assumption that its brand integration would deliver tangible results. "There's so much attention and marketing juice behind the movie, and the fact that we were able to secure the spot on the drivers' chest and on the car…has made it where anyone who is promoting the movie is also promoting Expensify," noted Expensify Chief Financial Officer (CFO) Ryan Schaffer (Stern 2025a, p. 4). "Ultimately though, we want this to turn into revenue. The jury is still out on that."

Thus, this study's research question echoes that of Schaffer, but from the perspective of financial market investors: How does a marketing property's performance against expectations

influence shareholders' assessments of the associated brands? More specifically, as related to the case in this paper: When *F1 The Movie*'s commercial performance proved stronger than expected, did investors revalue the brands authentically integrated into it?

To answer this question, we utilize the event study methodology based on Fama's (1970) efficient market hypothesis, which provides a time-series measure of the financial market's judgment of the investment. Given that the sponsorships were public long before the film opened (Stern 2023), we treat the revelation of the film's performance—rather than the sponsorship announcement—as the information event, and we use Polymarket prices to establish when and to what degree that performance departed from expectations. The analysis covers seven publicly-traded firms that received brand integration in the movie, around its U.S. release on June 27, 2025: Electronic Arts, Expensify, GEICO, Heineken, Mercedes-Benz, SharkNinja, and T-Mobile.

This study makes three contributions. First, it demonstrates how prediction markets can serve as an expectation benchmark in marketing event studies, identifying an information event even when the marketing commitment was announced previously. Second, it demonstrates that sponsorship value can be realized when the sponsored property's performance is revealed, not only when the sponsorship is announced. Third, it extends horizontal marketing partnership authenticity (Charlton and Cornwell 2019) to capital markets by positioning authenticity as the mechanism that binds a sponsor's value to the property's performance.

Theoretical Framework

Saturated impressions to horizontal relationship authenticity

The conceptual evolution of sponsorship-linked marketing has systematically distanced itself from the traditional sponsorship-as-advertising paradigm, which views corporate

partnerships merely as vehicles for static brand exposure or buying commercial impressions (Cornwell 2019). This exposure-centric model routinely triggers consumer persuasion knowledge and defensive coping mechanisms, ultimately diluting the strategic value of the firm's sponsorship investment (Cornwell et al. 2005). Based on brand authenticity, characterized as "the extent to which consumers perceive a brand to be faithful and true toward itself and its consumers, and to support consumers being true to themselves" (Morhart et al. 2015, p. 202), the modern sponsorship-linked marketing framework emphasizes authentic engagement that leverages the pre-existing emotional connection of a passionate fanbase to facilitate a meaningful brand relationship (Cornwell 2019).

Crucially, the strategic efficacy of contemporary sponsorship-linked marketing hinges not on basic brand-to-object congruence, but on what Charlton and Cornwell (2019) conceptualize as horizontal marketing partnership authenticity (HMP-Authenticity). Rather than assessing isolated, static brand attributes, HMP-Authenticity requires that the collaborative relationship itself is perceived as unforced, intrinsically compatible, and integrated into the narrative of the sponsored property (Charlton and Cornwell 2019).

Cinematic product placement has evolved along a similar trajectory to sponsorship-linked marketing. Early conceptualizations distinguished visual screen placement, auditory script mentions, and plot connection, which evaluates how deeply a brand is woven into the storyline (Russell 2002). Gillespie and colleagues (2012) demonstrated that high visual prominence without a corresponding high degree of plot connection disrupts a viewer's narrative transportation and triggers persuasion knowledge, undermining the placement's effectiveness. Within this cinematic context, HMP-Authenticity operates as the realization of plot connection (Charlton and Cornwell 2019). When highly visible brands act as realism cues within a narrative

construction, visual blatancy ceases to be a commercial interruption and instead enhances narrative transportation.

In *F1 The Movie*, this partnership authenticity achieves an extraordinary expression. By integrating real-world, recognizable brands (e.g., Heineken and T-Mobile) into the physical assets and competitive setting of an entirely fictional racing outfit (APXGP), the brand integration transcends standard cinematic product placement (Wiles and Danielova 2009). Rather than distracting overlays, the brands become part of the narrative of the sport by appearing on team liveries, firesuits, and mock press conferences alongside F1 stars like Max Verstappen and Lewis Hamilton. Thus, the integration establishes a layer of HMP-Authenticity that bridges the fictional with the sport's genuine commercial ecosystem. Importantly, such integration also binds the brands to the film itself. The more authentically a brand is woven into the story, the more its exposure and meaning depend on how widely and how favorably the film is received.

Market Expectations and the Revaluation of Marketing Assets

Quantifying how relationship authenticity translates into measurable shareholder wealth requires an understanding of capital market behavior. Grounded in the efficient market hypothesis, the event study methodology is the accepted research standard for isolating the economic value of marketing initiatives because stock price movements around marketing events capture the aggregate, forward-looking assessments of investors (Sorescu et al. 2017). Given that investors price the expected value of a marketing commitment when it is announced, a later revaluation should occur only when new information changes the expected performance of the underlying marketing asset (Fama 1970).

Historically, however, capital markets have greeted high-expenditure sport sponsorships with profound skepticism. A meta-analytic review of sponsorship event studies by Kwon and

Cornwell (2021) revealed that the aggregate stock market response to sport sponsorship announcements is statistically nonsignificant, largely due to pre-announcement information leakage and mature asset-market positioning. In Formula One, sponsorships have drawn significant negative abnormal returns, indicating that investors often interpret these global outlays as managerial agency conflicts rather than instruments for cash flow generation (Cobbs et al. 2012).

Evidence from entertainment and sport suggests where revaluations should occur. Joshi and Hanssens (2009) found that studio stock returns following a film's release depend on its box-office performance relative to pre-launch expectations, such that a film exceeding modest expectations is rewarded more than a heavily promoted film that merely meets them. Similarly, sponsors of Indianapolis 500 teams have gained market value when their sponsored cars achieved on-track success (Cornwell et al. 2001). In both cases, however, expectations had to be inferred indirectly. Prediction markets make them observable, aggregating traders' beliefs into probabilities that have proven to be informative forecasts (Wolfers and Zitzewitz 2004), including motion picture performance (Elberse 2007; Spann and Skiera 2003).

Authentic Integration and Performance Surprise

In their foundational study, Wiles and Danielova (2009) established that product placements in successful films are generally associated with positive movements in firm stock prices around opening weekend. However, these financial returns are sensitive to execution-related factors (Wiles and Danielova 2009), such as audience absorption (where the narrative distracts from the brand) and blatancy (which triggers commercial skepticism).

Relationship authenticity may reduce this friction. The brand integrations in *F1 The Movie* are foundational to the film's pursuit of realism: the blue-chip brands appear in their

natural, authentic environment of the highly commercialized F1 pit lane, where blatancy serves as confirmation of realism rather than a trigger of persuasion filters (Charlton and Cornwell 2019). The movie's sponsorships were public well before release, but the value they would deliver depended on the film's true reach, global box-office footprint, and cultural cachet, all of which remained uncertain until the film's opening weekend. Before release, investors could price only an expectation of that performance, which uniquely, a prediction market made observable.

Authenticity and unexpected performance therefore play distinct but complementary roles. Authenticity determines how tightly a sponsor's value is bound to the property. Brands woven into the narrative as realism cues share in the film's reach and meaning, whereas peripheral placements that audiences discount gain little from the film's success (Charlton and Cornwell 2019; Wiles and Danielova 2009). Performance surprise determines when, and how much, that bound value is revalued. Investors should respond when the property's performance departs from what they expected (Joshi and Hanssens 2009). The film's release revealed both at once, as audiences and critics first experienced the authentic integration and box-office results confirmed the film's reach. We therefore expect that sponsors authentically integrated into *F1 The Movie* experienced positive abnormal returns when the film's opening performance exceeded market expectations.

Data and Method

Our sample includes seven publicly-traded firms whose brands were integrated into *F1 The Movie* through the production's sponsorship program (Stern 2023, 2025b): Electronic Arts, Expensify, GEICO, Heineken, Mercedes-Benz, SharkNinja, and T-Mobile. Day 0 is the film's U.S. release on Friday, June 27, 2025, the first trading day on which box-office results,

beginning with Thursday preview grosses, were public. The opening-weekend estimate of $55.6 million was reported before trading resumed on Monday, June 30 (day 1) (Boxoffice Pro 2025). To benchmark expectations, we use Polymarket's contract on the film's domestic opening-weekend gross (Polymarket 2025). The contract, which opened on June 24, 2025, offered five mutually exclusive outcome ranges (less than $43 million; $43–47 million; $47–51 million; $51–55 million; more than $55 million), resolved on the final three-day figure reported by The Numbers (Nash Information Services n.d.), and attracted roughly $596,000 in trading volume. Each outcome's price represents its market-implied probability because a share pays $1 if the opening lands in that range and $0 if it doesn't, so it trades between $0 and $1 (Wolfers and Zitzewitz 2004). We retrieved hourly prices for all five outcomes from Polymarket's public price-history interface. As Figure 1 shows, the implied probability of an opening above $55 million stood at about 50% at the close of U.S. trading on June 26 (day -1), and rose to 87% by 11:00 a.m. ET on the U.S. release day. Using range midpoints (and $58 million for the open-ended top range), the implied expected opening rose from approximately $54 million to $57 million between the close of day -1 and the close of day 0. The contract therefore resolved in the highest range.

The event study methodology has been well-established and extensively utilized in the academic literature as a way to identify the abnormal stock market returns associated with an event, thereby capturing the market's perception of the financial impact of the event on the firm's value. Generally, the event being studied is informational in nature, and in this study, the information revealed is the performance of the film relative to expectations, which the Polymarket prices enable us to accurately date.

While the method originated in the accounting and finance literature (Ball and Brown 1968; Fama et al. 1969), it has also been applied extensively to assess the financial impact of sponsorship announcements (see Kwon and Cornwell 2021 for a meta-analytic review), including teams participating in the Indianapolis 500 (Cornwell et al. 2001), Formula One sponsorships (Cobbs et al. 2012), and basketball jersey sponsorships (Jensen et al. 2023). To capture the abnormal return associated with the studied event, the method must first identify the expected return for the stock absent the event. We utilize the Market-Adjusted Returns Model and the Market Model, the two most commonly-utilized event study models.

The Market-Adjusted Returns Model starts with the assumption that the stock's return absent the event would have been equal to the return of the associated market index. While a more simplistic model than the Market Model, the Market-Adjusted Returns Model has been shown to perform well, even when compared to more complex event study models (Brown and Warner 1980, 1985). The abnormal return for each day in the event window is simply the return of the stock minus the return of the market index, as shown in Equation 1:

$$AR_{i,t} = R_{i,t} - R_{m,t} \quad (1)$$

such that $AR_{i,t}$ represents the abnormal return for stock *i* on day *t*, $R_{i,t}$ represents the return for stock *i* on day *t*, and $R_{m,t}$ represents the market return for stock *i* on day *t*.

To ensure that our results are robust to more complex event study models, we also calculate abnormal returns using the Market Model, which uses the relationship between the stock and the market during an estimation window to determine the stock's expected return. The α and β for stock *i* are estimated using Equation 2:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (2)$$

such that $R_{i,t}$ and $R_{m,t}$ are as defined in Equation 1 and $\varepsilon_{i,t}$ represents the error term. The α_i and β_i terms are then used to calculate the expected return portion that is subtracted from the actual return to identify the abnormal return as shown in Equation 3 below:

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{m,t}) \quad (3)$$

such that $AR_{i,t}$ represents the abnormal return for stock *i* on day *t*, $R_{i,t}$ represents the return for stock *i* on day *t*, $\hat{\alpha}_i$ represents the calculated α for stock *i* from the estimation window, $\hat{\beta}_i$ represents the calculated β for stock *i* from the estimation window, and $R_{m,t}$ represents the market return for stock *i* on day *t*. Therefore, $\hat{\alpha}_i + \hat{\beta}_i R_{m,t}$ represents the expected return for stock *i* absent the event.

For the Market Model, we use the commonly used estimation window of 250 trading days, representing approximately one trading year. In both models, daily abnormal returns (ARs) are summed across the event window to calculate each firm's cumulative abnormal return (CAR), and these CARs are averaged across firms in the sample to calculate the cumulative average abnormal return (CAAR).

Results

The results of the event study analysis are presented in Table 1, with Panel A reporting the Market-Adjusted Returns Model and Panel B the Market Model. In both panels, the market reacted positively on the release day and the following days for the firms sponsoring F1 The Movie. The cumulative average abnormal returns (CAARs) on the release day (day 0) are 1.88% and 1.51% for the Market-Adjusted Returns Model and Market Model, respectively. We assess statistical significance with the parametric test of Boehmer, Musumeci, and Poulsen (1991) (henceforth BMP), which addresses event-induced variance, and the nonparametric Corrado and Zivney (1992) test (henceforth CZ), which is less reliant on distributional assumptions given the

small sample size of our study. Because all firms share the same event date, we also apply the Kolari and Pynnönen (2010) adjustment (henceforth KP) to the BMP test for cross-sectional correlation of abnormal returns. Despite our sample of only seven observations, the day-0 CAAR is statistically significant at the 95% confidence level for the Market-Adjusted returns using BMP, and at the 90% confidence level for the Market-Adjusted returns using CZ, as well as the Market Model using both BMP and CZ.

Across the entire opening weekend (event interval 0 to 1), the CAARs increase to 2.75% using the Market-Adjusted Model and 2.00% using the Market Model, significant at the 99% confidence level using BMP and at the 95% confidence level using CZ and KP for both models. The timing of these returns mirrors the Polymarket benchmark: the day-0 abnormal return coincides with the rise in the implied probability of an opening above $55 million from approximately 50% at the prior day's close to 87% by late morning of the release day, and the additional return on day 1 follows the weekend in which the opening total was confirmed. The CAARs continue to increase through day 3, but reverse some (and become less significant as more noise is introduced) when expanded to include the entire following trading week. We also examine the three trading days before release (event interval −3 to −1) to assess whether the returns were anticipated. The Market-Adjusted Model results in Panel A of Table 1 show that there was some anticipation by the market, with positive cumulative abnormal returns of 1.81% in the days leading up to the premiere and statistical significance at the 99% confidence level using BMP and 95% using Kolari. However, when including the additional factors of the Market Model, the results become non-significant. To ensure that our results are robust to the removal of Mercedes-Benz, given Mercedes is both a sponsor and constructor of the car in the movie, and their F1 team competed in the Austrian Grand Prix on the weekend of the release, we have also

examined the results with the remaining six firms. Overall, the results are similar and materially unchanged, though the CAARs tend to be slightly lower, with mixed impact on the statistical significance as some windows become slightly more significant and others slightly less significant.

Discussion

The positive market reaction to the sponsoring firms embedded in *F1 The Movie* indicates that investors revalued the brands authentically integrated in the film when its commercial performance proved stronger than expected. Sponsoring firms realized a statistically significant cumulative average abnormal return (CAAR) of 1.88% on the U.S. release day, when the Polymarket-implied probability of an opening above $55 million rose from about 50% to 87%, and 2.75% across the opening weekend utilizing the Market-Adjusted Returns Model. Some revaluation preceded release (1.81% over days -3 to -1, Market-Adjusted Model only), consistent with the optimism in Polymarket prices on June 25 (Figure 1). For the median sponsor, this abnormal return represents a market capitalization increase of approximately $230 million.

First, this study advances the marketing–finance interface by demonstrating how prediction markets can serve as an expectation benchmark for marketing event studies. Event studies conventionally rely on the announcement of a marketing action to identify an information event (Sorescu et al. 2017). Here, the sponsorships were public two years before the film's release (Stern 2023), yet a real-money prediction market allowed us to observe when, and to what degree, expectations for the underlying marketing asset changed. This extends the logic of Joshi and Hanssens (2009), who inferred expectations from pre-launch advertising to explain studio returns, to the brand partners embedded in a film, and it complements Wiles and

Danielova (2009) by linking the opening-weekend return to a measured revision of expectations rather than to the release date alone. As prediction markets expand, researchers can use them to identify information events that were previously invisible.

Second, the findings suggest that sponsorship value is realized not only when a sponsorship is announced but also when the sponsored property's performance is revealed. The efficient market hypothesis asserts that stock prices immediately reflect investors' expectations of future marketing performance when the marketing commitment is announced, so a recalibration of stock prices should be observable only when performance deviates from those expectations (Fama 1970). Such moments of deviation have been elusive for researchers to capture, and sponsorship research has observed them mainly when sponsored teams achieved on-track success (Cornwell et al. 2001). *F1 The Movie* offers a marketing analogue. The positive returns documented here, in contrast to the skepticism with which investors have greeted F1 sponsorship announcements (Cobbs et al. 2012), indicate that the timing of information in relation to the property's performance versus expectations shapes the market's verdict on sponsorship.

Third, the findings extend horizontal marketing partnership authenticity (Charlton and Cornwell 2019) from consumer-level outcomes to capital markets and clarify how authenticity and performance surprise work together. Performance surprise explains when sponsors were revalued, whereas authenticity explains why the film's success accrued to its sponsoring partners. Placement research shows that brand prominence without plot connection disrupts narrative transportation and invites persuasion knowledge (Gillespie et al. 2012; Russell 2002). In *F1 The Movie*, branding on liveries, firesuits, and press-conference backdrops functioned as realism cues within the narrative, so the film's reach extended to its sponsors rather than being

discounted as commercial clutter. Our results are consistent with this account, although a single-film design cannot separate the contribution of authenticity from that of the film's performance, a distinction we return to below.

For managers, the findings carry three implications. First, the payoff from an entertainment integration depends on how the property performs relative to expectations, so sponsors should prepare activation that can scale quickly once strong performance is confirmed. Second, because evidence of revenue arrives late, prediction markets offer executives an early, public signal of a property's expected reach. Third, for rights holders such as Apple and Formula One, authentic integration is valuable inventory that can reduce production costs while creating value for the brands that purchase it (Stern 2025a).

Limitations and Future Research

Despite these contributions, several limitations warrant future research. First, the sample is restricted to seven publicly-traded firms integrated into a single film that shares one event date. While non-parametric tests and the Kolari and Pynnönen (2010) correction support the opening-weekend results, future research should construct broader samples across multiple entertainment properties. Second, this design cannot separate the effect of authentic integration from the effect of the film's performance. Comparing sponsors with differing depths of integration across films whose performance is benchmarked by prediction markets would allow a direct test of their interplay. Third, the Polymarket contract was relatively thin and its highest range was open-ended, so it captures the timing of the surprise more precisely than its magnitude. Finally, event studies cannot measure realized cash flows, and concurrent marketing campaigns may have contributed to the returns.

To conclude, Expensify's CFO observed that the jury was still out on whether the company's integration in *F1 The Movie* would turn into revenue. Investors, however, reached an early verdict indicated by the rise in market value for the brands authentically woven into its story when the film's opening exceeded expectations. For researchers, the case demonstrates that prediction markets can make visible the expectations against which marketing performance is judged.

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Table 1.
Cumulative Average Abnormal Returns (CAARs) to Sponsoring Firms Following the U.S. Release of F1 The Movie (n=7)

Panel A.
Market-Adjusted Cumulative Average Abnormal Returns (CAARs)

Event Interval	CAAR	BMP	CZ	Kolari
-3 to -1	1.81%	***		**
0	1.88%	**	*	
0 to 1	2.75%	***	**	**
0 to 3	3.68%	***	**	*
0 to 5	2.55%	**		

Panel B.
Market Model Cumulative Average Abnormal Returns (CAARs)

Event Interval	CAAR	BMP	CZ	Kolari
-3 to -1	0.39%			
0	1.51%	*	*	
0 to 1	2.00%	***	**	**
0 to 3	2.54%	*	**	
0 to 5	1.26%			

Notes. Day 0 = June 27, 2025 (U.S. release).
BMP = Boehmer et al. (1991) test; CZ = Corrado and Zivney (1992) test.
*, **, and *** denote statistical significance at the $p < .10$, .05, and .01 levels, respectively.

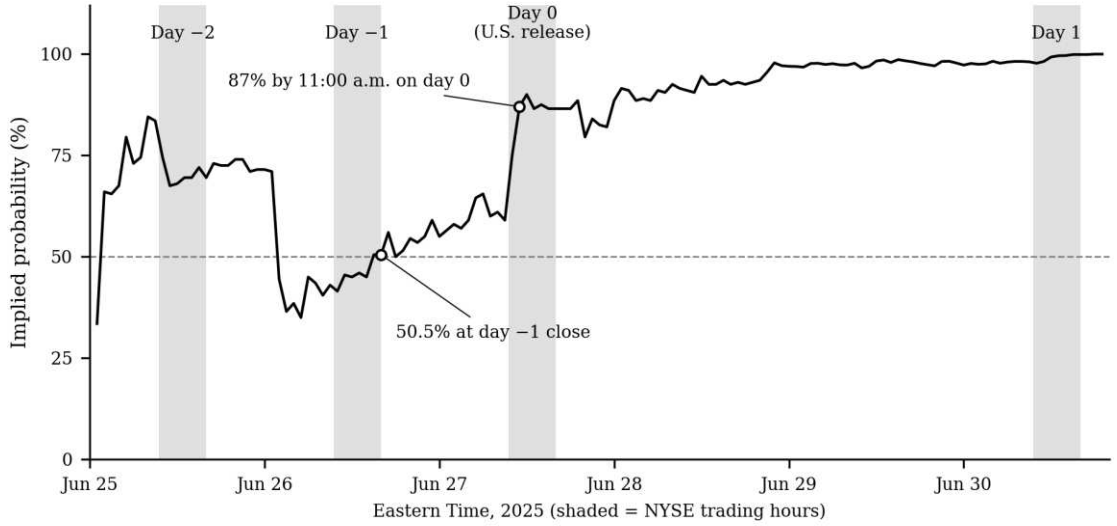


Figure 1.
Polymarket-implied probability of a domestic opening weekend above $55 million for *F1 The Movie*, June 25–30, 2025

Note. The implied probability is inferred from the > $55 million share price. A ‘yes’ (i.e., ultimately accurate) contract share pays $1 and $0 otherwise; so before settlement, it trades between $0 and $1.