Investment sentiment in the Structured Equity Product: Evidence from the Korean Stock Market

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Abstract

This study investigates whether issuance activity in the structured equity product (SEP) market contains information about the future performance and risk of the underlying stocks in the Korean market. Building on prior research of Henderson et al. (2023), I construct a stock-level SEP sentiment measure that captures the intensity of SEP issuance, reflecting retail-investor-driven demand. Using this measure, I find that SEP sentiment does not predict raw stock returns but strongly predicts *market-adjusted* returns: stocks with higher sentiment values exhibit significantly lower future abnormal returns in both panel and Fama–MacBeth regressions. Moreover, SEP sentiment is positively associated with downside risk, as evidenced by higher probabilities of default. Portfolio analyses further reinforce these findings, showing that sentiment-weighted portfolios deliver persistent negative abnormal returns and a steadily declining cumulative abnormal return over the 2006–2023 period. Overall, the results indicate that SEP issuance embeds time-varying sentiment, providing a forward-looking signal of negative return dynamics and elevated downside risk at the individual-stock level.

Keyword: Structured equity product market, crash signal, timing behavior, retail investors, investment sentiment

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1. Introduction

In standard asset pricing theory, derivatives are valued under the assumption that they do not affect the prices of their underlying assets. In practice, however, a growing literature documents that derivative trading can feed back into the underlying market, even in simple exchange traded option markets. This feedback channel is likely to be stronger for complex over the counter (OTC) products, where payoff structures are nonlinear and investor sophistication is limited. In this paper, I study this channel using structured equity products (SEPs) in Korea and use SEP issuance on a given stock as an investment sentiment signal about that stock's future return.

The main purpose of this paper is to examine whether sentiment originating from the SEP market helps predict future expected returns and risk of the underlying stocks in the Korean market, using monthly data from September 2006 to December 2023. While prior studies construct sentiment measures from exchange-traded derivatives or market-wide issuance indicators, this paper focuses on the retail SEP market because SEPs are predominantly purchased by unsophisticated retail investors rather than informed institutional investors (Celerier and Vallee, 2017; Egan, 2019; Shin, 2018). As retail investors generate the primary demand for SEPs, issuers introduce new products in response to this demand, and the resulting issuance patterns therefore reflect these investors' expectations about future returns and risk.

A central question is: under what conditions are SEPs issued in large volume, and what does that imply for future stock returns? Henderson and Pearson (2011) and Choi, Kim, and Liu (2014) show that issuers tend to sell retail structured products when information asymmetry is large and when products can be sold at a price above their model implied fair value. In this paper, I focus on SEPs with a down in knock in barrier put option feature, which is the dominant payoff type in the Korean SEP market and is widely used in other developed markets such as the United States, Switzerland, and Germany. Structurally, these products resemble reverse convertibles: the issuer is effectively long a put option and short a digital call option. When the underlying stock price declines, the embedded put option becomes more valuable, and issuers benefit from having sold the product at an initial premium to retail investors.

From the demand side, retail investors are attracted to these products when past performance is strong. As SEPs typically include early redemption conditions, positive recent returns of the underlying stock increase the likelihood of early call and coupon payment, which in turn improves reported historical performance of the product. Unsophisticated investors tend to chase such high past performance and high coupon rates, leading to concentrated demand exactly when the underlying has done well.

From the supply side, issuers have strong incentives to launch SEPs in periods when past returns are high but future returns are expected to be lower. They can embed generous coupons and still collect a premium because the pricing of the embedded put options reflects elevated variance risk and expected downside, which retail investors do not fully understand. Choi, Kim, and Liu (2014) show that issuers optimally sell such products when they expect negative excess returns and rising idiosyncratic volatility of the underlying stocks, implying that SEP contracts can be overpriced relative to fundamentals. Moreover, from the supply side, issuers have stronger incentives to launch these products when market volatility is elevated. Because the issuer's hedging strategy generates gamma profits, buying the underlying when prices fall and selling when prices rise, the expected hedging gains increase with volatility. These gains allow issuers to offer higher coupon rates while still maintaining a favorable margin, making high-volatility periods particularly attractive for issuing SEPs. As a result, SEP issuance tends to cluster in periods and on stocks with elevated volatility, further reinforcing issuance waves.

Information asymmetry is also amplified in volatile periods. When volatility rises, the theoretical value of the embedded put option increases, enhancing the issuer's ability to offer products with high coupon rates while still preserving a comfortable margin. At the same time, higher volatility makes the payoff structure more complex and the mapping from volatility to fair value harder for retail investors to understand. This combination of high past returns, high volatility, and retail demand for high coupons creates a natural environment for pricing bubbles in SEPs and for issuer timing behavior. In the language of the variance risk premium literature, high past returns and bullish sentiment can be associated with a high variance risk premium and low subsequent stock returns (Bollerslev, Tauchen, and Zhou, 2009; Drechsler and Yaron, 2011; Bollerslev, Todorov, and Xu, 2015; Kilic and Shaliastovich, 2019; Pyun, 2019). SEP issuance can therefore be interpreted as a stock level sentiment signal that future expected returns are low.

This mechanism closely parallels the investment sentiment measure of Baker and Wurgler (2006, 2007), who construct a market wide sentiment index using IPO activity, first day IPO returns, and the equity share in total new issues. Their interpretation is that equity issuance activity is high when stocks are overvalued, thus issuance-based sentiment predicts future market corrections. In a similar spirit, I treat SEP issuance as an issuance-based sentiment measure, but with two important differences. First, SEP sentiment is defined at the individual stock level rather than the aggregate market level, allowing a much finer cross-sectional signal. Second, while an IPO is a one-time event for a given stock, SEPs referencing the same stock are repeatedly issued, so the SEP sentiment is a time varying series that provides a continuous signal for the underlying firm's future performance.

The Korean SEP market provides an especially ideal environment for examining these questions. First, relative to the size of the underlying equity market, SEP issuance in Korea is exceptionally large. Using the SRP Structured Product Database, Auh and Cho (2023) show that Korea accounts for about 16 percent of global open interest in knock-in barrier type SEPs and exhibits the highest ratio of SEP outstanding volume to stock market capitalization (about 4.3 percent in Korea versus 0.3 percent in the United States). These figures suggest that feedback effects from SEP issuance on underlying stock prices can be quantitatively meaningful. In addition, Table 1 (Panel B and Panel C) and Figure 1 show that although total SEP proceeds have increased over time, the number of distinct underlying stocks has declined, implying that SEP issuance has become increasingly concentrated in a small set of stocks.

Second, more than 90 percent of Korean SEPs are sold to retail investors (Financial Supervisory Service, 2025).[1] Since these investors have limited knowledge of option pricing models and little negotiation power, pricing bubbles are more likely to occur.

Lastly, the Korean SEP market is highly standardized in terms of payoff structures. More than 70 percent of products pay coupons only when the underlying stock price exceeds a specified strike or hurdle level on observation dates. Only a small fraction of SEPs adopt alternative structures such as range-type hurdles or inverse conditions that pay coupons when the stock price falls below a threshold. This concentration on upward-hurdle coupon structures allows empirical analysis to focus on a dominant and relatively homogeneous payoff type.

On the other hand, several firm-level measures capture retail-investor sentiment through alternative channels. To control for these factors, I incorporate an additional sentiment measure that reflects how retail investors respond to firm-specific information delivered through the media. Prior literature shows that retail investors react strongly to news coverage and that news tone meaningfully influences retail trading and belief formation. In a related spirit, Henderson et al. (2023) control investor attention using the Google Search Index when examining derivative-based sentiment. Similar to this approach, I incorporate a firm-level news sentiment measure to capture shifts in broad retail sentiment that are less distinct from SEP issuance activity. By controlling news-based sentiment, the empirical analysis isolates the incremental predictive power of SEP sentiment and ensures that the results are not driven merely by contemporaneous media tone or retail attention shocks.

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[1] According to the FSS (2025) report, SEP investors consist of bank-channel purchasers (21.8%), public offering investors (23.9%), retirement pension accounts (45.9%), asset-management accounts (2.1%), and others (6.3%). The “others” category includes proprietary trading of banks and securities firms, pension funds, and corporations. Excluding this category, the vast majority of SEP purchasers can be regarded as individual retail investors.

The main findings are as follows. First, I find that when SEP issuance on a stock is high, that stock subsequently experiences lower future *abnormal* returns. The portfolio constructed using the SEP sentiment measure exhibits steadily declining cumulative abnormal returns based on the market model. Second, SEP sentiment is positively associated firm-level downside risk, as reflected in higher future probabilities of default. This suggests that issuer timing behavior and pricing distortions in the retail SEP market create a bubble at issuance, and the eventual correction of this bubble is manifested in negative future returns of the underlying stocks. Third, these results remain robust even after controlling firm-level news sentiment, indicating that the predictive power of SEP sentiment is distinct from and incremental to retail attention or sentiment captured through media tone.

This paper makes several contributions. First, it provides new evidence on a feedback channel from complex OTC derivatives to the prices and risk of underlying stocks in the Korean market, which offers an especially suitable environment for examining these effects. Second, it proposes a new issuance-based sentiment measure at the individual stock level, which complements existing market wide measures such as Baker and Wurgler's index and is particularly suitable for the Korean market where IPO based sentiment is less informative. Third, it shows that this sentiment measure is not only statistically significant but also economically meaningful from a portfolio perspective: a simple strategy that weights stocks by SEP sentiment generates persistent negative abnormal returns using large, liquid stocks that are readily tradable. Finally, by focusing on a setting where unsophisticated retail investors face sophisticated issuers, the paper sheds light on how information asymmetry and product complexity in the structured product market can create systematic mispricing and investment sentiment that is visible in issuance data.

The remainder of the paper is organized as follows. Section 2 describes the construction of the SEP sentiment measure, the data, and the empirical design. Section 3 presents the main empirical results, and Section 4 reports robustness analyses, including alternative specifications. Section 5 concludes.

2. Research design

2.1. Payoff structure of Structured equity product (SEP) in the Korean Market

This section provides an overview of the typical payoff structures of structured equity products (SEPs) in the Korean market. Most SEPs are designed as autocallable notes, and they are marketed in two primary forms: equity-linked securities (ELS) and equity-linked bonds (ELB). The two product types share nearly identical payoff structures. The key distinction lies in principal protection: ELS exposes investors to potential losses of principal, whereas ELB guarantees the principal regardless of the performance of the underlying assets. Aside from this feature, their coupon-generating payoff mechanisms are essentially the same.

The payoff structure for a standard ELS is as follows. SEP investors receive their principal along with a fixed coupon if, on designated observation dates, the price of the underlying asset exceeds the strike level of a digital call option (for example, 80 percent of the initial price). If the product references a basket of underlying assets, the redemption condition is determined by the worst-performing stock in the basket. Observation dates include both the maturity date and predetermined interim dates, typically set monthly or quarterly. Because coupon payments are contingent on these discrete checks, the investor is effectively long a sequence of digital call options with exercise dates matching the observation schedule. If the digital call condition is satisfied on any observation date, the product is automatically called, terminating all subsequent payoff opportunities.

If the product is not called before maturity, the investor may incur a loss depending on whether the knock-in barrier has been breached. Suppose the knock-in barrier is 70 percent of the initial fixing price. If the underlying asset never falls below this barrier at any point before maturity, the investor does not incur any loss of principal. Depending on the specific ELS structure, some products return only the principal at maturity without any coupon, whereas others return both the principal and the coupon. The receipt of the coupon depends on whether the digital call condition has been satisfied on any observation dates during the life of the product.

However, if the 70 percent barrier is breached, the maturity payoff becomes linked to the final performance of the underlying asset. In such cases, for example, a maturity return of –20 percent would result in a 20 percent loss of principal for ELS investors.

For ELB products, the payoff structure up to the coupon-generating digital call feature is identical, but the minimum payoff is bounded below by the principal. Thus, even if the barrier is breached and the underlying performs poorly, ELB investors do not lose principal, whereas ELS investors do.

2.2. Data construction

Structured equity products (SEPs) in Korea are traded over the counter, and detailed contract-level information is not centrally provided. Therefore, I construct the dataset through extensive hand-collection. I begin by obtaining issuance information and ISIN codes from FnGuide. Using these identifiers, I gather the corresponding prospectuses from the Korea Securities Depository (KSD) and the Financial Supervisory Service (FSS), and manually match each prospectus to the issuance record to extract contract information on payoff structures.

Through this process, I identify 155,078 SEP contracts issued between 2006 and 2023. I exclude Derivatives Linked Securities (DLS) and products whose underlings are indices or foreign stocks, and therefore retain only products linked to individual Korean stocks. After applying these filters, 25,818 SEPs remain in the sample. I then remove products that do not include a downside barrier, including those with only upside or range barriers, since these products are not suitable for capturing sentiment associated with downward risk (Auh and Cho, 2022; Henderson et al., 2023).[2] After this additional screening, the final sample consists of 24,819 SEPs. As reported in Panel A of Table 1, these filtering steps reduce the dataset from 155,078 to 24,819 contracts.

Panel B reports the issuance trends of SEPs in the Korean market. SEP issuance begins in 2003, and the primary product type is equity linked securities (ELS). However, issuance volume during the early years remains very small, and the market expands meaningfully only after 2006. For this reason, the empirical analysis in this study begins in 2006. A new product type, the equity linked bond (ELB), is introduced in 2013. Although ELB contracts share similar payoff structures with ELS, the key difference is the guarantee of the investor's principal. ELS exposes investors to potential losses, whereas ELB guarantees principal repayment. If under the condition where ELS investors lose their principals, ELB investors might receive only their principals without any coupons. After the introduction of ELBs, the relative popularity of ELS declines while ELBs gain increasing market share, as reflected in both issuance counts and proceeds.

The general characteristics of SEP contracts are reported in Panel C. SEP products has underlyings its average underlying 1.83 stocks. And the average maturity of SEP contract is about 2 years (1.98). Number of unique underlying stocks from contracts are increase to 82 in 2014, while the unique stocks are decline to 22 in 2023. However, according to Panel B, issuance and procced amounts of SEP is getting increased, this implies that SEP issuances are significantly concentrated in the certain stocks. This is very good characteristic to generate the downward sentiment of underlying stocks using SEP information.

Panel C summarizes the general characteristics of SEP contracts. On average, each SEP references 1.83 underlying stocks, and the average maturity is approximately 2 years. The number of unique

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[2] For the main analysis, I focus on SEPs that contain knock in down in put options, because these structures directly capture investor demand for downside exposure and provide a cleaner measure for identifying sentiment that anticipates negative returns. Restricting the sample to these structures yields 24,819 SEPs, covering 122 underlying stocks during the sample period.

underlying stocks increases steadily through 2014, reaching 82, but declines sharply to 22 by 2023. Combined with the increasing issuance and proceeding amounts in Panel B, this pattern suggests that SEP issuance has become increasingly concentrated in a limited set of stocks. This concentration is particularly useful for the purpose of this study, as it implies that SEP activity embeds strong signals about investor sentiment, especially regarding anticipated downward risk in the underlying stocks.

2.3. Measuring SEP sentiment

To quantify the information embedded in structured equity product issuances, I construct a stock-level SEP sentiment measure that reflects the intensity of issuance activity relative to each firm's trading environment. The idea is that when issuers and retail investors are heavily engaged in launching SEPs on a particular stock, such activity contains information about their expectations regarding future performance. This approach is conceptually related to the issuance-based sentiment measure in Henderson et al. (2023), although I adapt the construction by normalizing issuance amounts using trading volume rather than market capitalization. Volume-based normalization captures the market impact of SEP issuance more effectively, given that issuance scale is naturally tied to liquidity conditions.

Based on this intuition, the SEP sentiment measure for stock i in month t is defined as follows:

$$SENT_{i,t}^{SEP} = \frac{\sum_{j=1}^{J} IssueAmount_{i,j,t}}{AvgTradingVolume_{i,t}}, \quad (1)$$

where $IssueAmount_{i,j,t}$ is the total issuance amount of SEP contracts contract j of stock i on month t, $AvgTradingVolume_{i,t}$ is the six-month average trading volume of stock i in month t.[3] When an SEP includes multiple underlying assets, its issuance amount is divided equally across the underlying stocks.[4] As one underlying stock has multiple SEP contracts on month t, J refers to the total number of SEP contract of stock i on month t.

Normalizing issuance by trading volume accounts for the fact that larger and more liquid stocks naturally accommodate larger contract sizes. By scaling issuance relative to each stock's liquidity, the

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[3] Not reported results shows that 1-month, 3-month, 1-year average trading volume does not change the main results. Also, following the Henderson et al. (2024), where divide by market equity also results remain the same.

[4] Assume that one SEP issued by 10 million dollars with two underlying assets. The issuance amount of contract j of each underlying asset, then, is assigned to 50 million dollars.

measure captures the relative issuance pressure exerted on the stock rather than its absolute contract size.

I expect that higher SEP sentiment values—indicating more intense issuance activity—are associated with lower future stock returns and higher future volatility, reflecting the negative information embedded in SEP issuance.

2.4. Portfolio construction based on SEP sentiment measure

To test the hypothesis that SEP sentiment can expect the future return more systemically, I construct the portfolio based on SEP sentiment measure, following Henderson et al. (2023).

For firm I on month t,

$$w_{i,t} = \frac{SENT_{i,t}}{\sum_{i=1}^{N} SENT_{i,t}}, \tag{2}$$

where $SENT_{i,t}$ is defined in Equation (1), and $\sum_{i=1}^{N} SENT_{i,t}$ is the sum of $SENT_{i,t}$ of all stocks (*i=1, 2, ..., N*) on month t. Using this weight, portfolio can be constructed by weighing more on stocks with higher SEP sentiment. I expect ,therefore, that the portfolio's future return will be negative.

Using this weight, I construct the three different portfolios, based on the expectation period. For stock I on month t, I construct portfolios:

$$R_{p,t+m} = \sum_{i=1}^{N} w_{i,t} * R_{i,t+m}\,, (m = 1, 2, 3) \tag{3}$$

where $R_{p,t+m}$ is the constructed portfolio returns using current sentiment weight ($w_{i,t}$) and individual stock returns m month after t ($R_{i,t+m}$).

2.5. News sentiment measure

Since the SEP sentiment measure reflects the behavior of retail investors, it is essential to control for other forms of investor sentiment that may also influence stock returns. To account for this, I incorporate a news-based sentiment measure that captures firm-level information flow from the media. Prior studies show that textual information in news articles contains meaningful signals about investor beliefs and future stock performance (Tetlock, 2007; Tetlock, Saar-Tsechansky, and Macskassy, 2008;

Engelberg and Parsons, 2011). More recent work also highlights that media tone affects retail trading behavior and market-wide sentiment (Boudoukh, Feldman, Kogan, and Richardson, 2019; Ke, Kelly, and Xiu, 2019).

Using the DeepSearch Database, I collect monthly news articles for each firm from the economics and business sections of major Korean newspapers. For each stock-month, I classify all articles into positive, negative, and neutral categories based on the sentiment labels provided by the database. I then construct a firm-level news sentiment score as:

$$NewsSent_{i,t} = \frac{Positive_{i,t} - Negative_{i,t}}{Positive_{i,t} + Neutral_{i,t} + Negative_{i,t}}. \quad (4)$$

As different firms may receive systematically different levels of media attention or tone, I standardize the sentiment score within each firm using a firm-specific mean and standard deviation. This normalization mitigates persistent cross-firm heterogeneity and allows the news sentiment measure to reflect time-varying changes in sentiment rather than level differences across firms.

2.6. Empirical models

2.6.1. Panel regression

To examine whether SEP sentiment predicts future stock performance and firm-level risk, I estimate panel regressions with firm and time fixed effects. The panel specification for return predictability is given by:

$$Return_{i,t+m} = \alpha_i + \alpha_t + \beta_1 SENT_{i,t} + \beta_2 I\big(SENT_{i,t} = 0\big) + \gamma X_{i,t} + \varepsilon_{i,t}, \quad (5)$$

where $Return_{i,t+m}$is either the raw return (Ret) and risk-adjusted return (*AdjRet*) of stock i in month $t + m$, with forecast horizons $m = 1,2,3, \ldots ,6$. Risk-adjusted returns are computed using the market model, as proxy for abnormal returns. The vector $X_{i,t}$includes firm size (log market capitalization; *Size*), the stock return in month t (Ret_t), and news sentiment measure (*NewsSent*). The dummy variable $I(SENT_{i,t} = 0)$ equals one when the SEP sentiment measure is zero, allowing the model to control for the average performance of stocks without SEP issuance in month t. Firm fixed effects α_i absorb time-invariant unobserved firm characteristics, and calendar-month fixed effects α_t capture market-wide shocks common across firms. Standard errors are clustered at the firm level.

For firm-level risk, I estimate the corresponding panel model:

$$Risk_{i,t} = \alpha_i + \alpha_t + \beta_1 SENT_{i,t} + \beta_2 I(SENT_{i,t} = 0) + \gamma X_{i,t} + \varepsilon_{i,t}, \quad (6)$$

where $Risk_{i,t}$ includes three-year realized volatility (*Vol*), probability of default (*PD*), and 3-year market beta (*Beta*). Three-year volatility is computed using monthly returns over a rolling 36-month window. The probability of default, $PD_{i,t}$, is estimated following Bharath and Shumway (2008) and serves as a proxy for firm-level downside risk.[5] Three-year market beta is estimated using 36 months of returns. The key coefficient of interest is again β_1. If SEP sentiment captures negative information about underlying firms, I expect β_1 to be negative for return regression in Equation (5) and positive for downside-risk measures in Equation (4).

2.6.2. Fama-MacBeth regression analyses

To complement the panel regression results, I estimate the following Fama–MacBeth (1973) cross-sectional regressions:

$$Return_{i,t+m} = \alpha + \beta_1 SENT_{i,t} + \beta_2 I(SENT_{i,t} = 0) + \gamma X_{i,t} + \varepsilon_{i,t}, \quad (7)$$

where $R_{i,t+m}$ denotes the abnormal return of stock i in month $t+m$, defined consistently with Equation (5). If SEP sentiment captures negative price pressure or deteriorating expectations embedded in SEP issuance, I expect negative β_1 and statistically significant across horizons. Standard errors are corrected using the Newey–West (1987) procedure with four lags.

To assess whether SEP sentiment predicts downside risk, I estimate an analogous specification in which the dependent variable is firm-level risk:

$$Risk_{i,t} = \alpha + \beta_1 SENT_{i,t} + \beta_2 I(SENT_{i,t} = 0) + \gamma X_{i,t} + \varepsilon_{i,t}, \quad (8)$$

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[5] The probability of default is estimated using the KMV model. The KMV-implied default probability is defined as:

$$PD = N(-DD) = N\left(-\frac{\ln\left(\frac{V}{F}\right) + (\mu_V - 0.5\sigma_v^2)T}{\sigma_V\sqrt{T}}\right),$$

where PD represents the probability of default, also known as the expected default frequency (EDF), and DD denotes the distance to default. The distance to default measures how far the current firm value is from the default boundary; a smaller DD implies a higher likelihood that the firm value will fall below the debt value. V is the market value of the firm's assets, F is the face value of debt, $\mu_V$and $\sigma_V$denote the expected annual return and volatility of the firm's assets, and T is the forecast horizon, set to one year in this study ($T = 1$).

where $Risk_{i,t}$ is measured by three-year volatility, probability of default, and three-year market beta. If SEP sentiment captures market perceptions of increasing downside exposure, β_1 is expected to be positive and statistically significant.

3. Empirical results

3.1. Panel regression

Table 2 reports the results of the main panel regressions. Each column presents estimates using forward-looking horizons from $t + 1$ to $t + 6$. Panel A examines raw stock returns as the dependent variable. Across all horizons, the coefficient on SEP sentiment ($SENT$) is negative, but the estimates are not statistically significant. The news sentiment measure ($NewsSent$) likewise shows no statistically significant relationship with future raw returns. These results suggest that raw returns are dominated by market-wide movements, making it difficult for either sentiment measure to explain cross-sectional variation in unadjusted returns.

As raw returns contain substantial variation unrelated to retail-investor-based sentiment, Panel B investigates abnormal returns computed from the market model. In Column (1), the coefficient on $SENT$ is negative and statistically significant at the 1% level, indicating that higher SEP sentiment predicts lower future abnormal returns after controlling for market effects. This negative relationship remains statistically significant up to six months ahead, although the magnitude declines slightly with the forecasting horizon. In contrast, $NewsSent$ enters with a positive and statistically significant coefficient, implying that more positive firm-level news is associated with higher abnormal returns. This pattern is consistent with the view that news tone captures information relevant to firm-specific performance once aggregated market movements are removed.

Panels C, D, and D analyze future risk measures. Panel C analyzes future realized volatility estimated from three years of monthly returns. SEP sentiment positively and significantly predicts future volatility across all horizons, indicating that higher SEP issuance is associated with elevated future uncertainty for the underlying stocks. The news sentiment measure also shows positive and significant coefficients, consistent with negative or uncertain news contributing to higher future volatility.

Panel D examines the probability of default (PD), a measure that more directly reflects downside risk. Across all horizons, $SENT$ is positively related to future PD with strong statistical significance. This indicates that SEP issuance captures information not only about return predictability but also about future distress risk of the underlying stocks.

Finally, Panel E reports regressions using market beta as the dependent variable. Since SEP sentiment reflects retail-investor-driven issuance patterns rather than exposures to systematic risk, I expect weak or no association. Consistent with this expectation, the coefficient on $SENT$ is statistically insignificant across all horizons, suggesting that SEP sentiment is orthogonal to market beta and is not capturing variation in systematic risk.

Taken together, the panel regression results show that SEP sentiment has little ability to predict raw returns or systematic risk, but it strongly predicts future *abnormal* returns and *firm-level risk*. Specifically, high SEP sentiment is associated with lower future market-adjusted returns, higher future volatility, and higher future probabilities of default. These findings support the interpretation that SEP issuance embeds information about time-varying investor sentiment and issuer timing behavior rather than fundamental exposures to aggregate risk.

3.2. SEP sentiment and Cumulative Abnormal Returns

Using the portfolio returns constructed from SEP sentiment, I compute the average abnormal returns based on the market model. The sentiment-weighted portfolio generates an average abnormal return of approximately –0.6% per month, indicating economically meaningful underperformance.

To examine the return dynamics over time, I compute the cumulative abnormal return (CAR) for the sentiment-weighted portfolio as follows:

$$CAR_t = \sum_{\tau=t_0}^{t} AR_\tau, \tag{9}$$

where AR_τ denotes the abnormal return in month τ, obtained as the residual from the market model:

$$AR_{p,t} = R_{p,t} - \left(\alpha_p + \beta_{MKT} MKT_t\right).$$

This formulation accumulates the monthly abnormal performance of the portfolio, allowing us to evaluate the long-run effect of SEP-based investment sentiment.

Figure 2 plots the cumulative abnormal returns from September 2006 to December 2023. The CAR series displays a persistent and monotonic decline throughout the sample period. Starting at zero, the cumulative abnormal performance drops steadily to –71.73% by the end of 2023. This long-horizon deterioration provides strong evidence that stocks with high SEP sentiment consistently underperform on a risk-adjusted basis. The sustained negative trajectory of CARs supports the hypothesis that SEP issuance embeds information about future negative return dynamics and issuer timing incentives.

4. Robustness Check: Fama-MacBeth Regression

To complement the panel regression results, I estimate Fama–MacBeth (1973) cross-sectional regressions. Table 3 reports the results for the same outcome variables used in Table 2: Panel A for raw stock returns, Panel B for market-adjusted returns, Panel C for three-year realized volatility, Panel D for probability of default, and Panel E for market beta.

Across specifications, the findings broadly mirror those from the panel regressions. First, as shown in Panel A, SEP sentiment does not predict raw returns; the coefficient on $SENT$ is negative but statistically insignificant across all horizons.

In Panel B, however, SEP sentiment strongly predicts market-adjusted returns. The coefficient on $SENT$ is negative and statistically significant, confirming that SEP sentiment captures variation in abnormal returns rather than total returns. This robustness check reinforces the conclusion that SEP issuance contains information about future risk-adjusted performance, consistent with issuer timing behavior and short-horizon return correction.

The results for the risk variables show notable differences from the panel regressions. In Panel C, SEP sentiment is negatively related to future realized volatility, which contrasts with the positive relationship reported in Table 2. Consistent with this interpretation, Panel D shows that $SENT$ continues to predict higher future probabilities of default, and the coefficients remain statistically significant across all horizons. Taken together, the Panel C and Panel D results suggest that once cross-sectional dependence is removed through the Fama–MacBeth procedure, SEP sentiment may be capturing a component more closely associated with downside risk rather than total return variability.

In Panel E, the coefficient on $SENT$ is positive but statistically insignificant, indicating that SEP sentiment is not systematically related to market beta. This is consistent with the expectation that retail-investor-based sentiment should not load on systematic risk factors.

The results for the news sentiment measure provide an informative contrast. In Panels A and B, $NewsSent$ enters with statistically significant coefficients but with opposite signs depending on the return measure. For raw returns, $NewsSent$ has a negative and significant coefficient, implying that positive firm-level news predicts lower subsequent raw returns. This pattern is consistent with prior literature showing that firm-specific news often leads to short-term return reversals rather than persistent trends (Tetlock, 2007; Tetlock, Saar-Tsechansky, and Macskassy, 2008; Engelberg, Reed, and Ringgenberg, 2012). By contrast, for market-adjusted returns, $NewsSent$ enters positively and significantly, reflecting the role of news tone in predicting the idiosyncratic component of future stock performance after controlling for market effects.

For the risk variables, news sentiment behaves as expected: it has no significant relationship with future volatility (Panel C), but it is significantly negative for the probability of default (Panel D) and significantly negative for market beta (Panel E), suggesting that positive news reduces firm-level downside risk and systematic exposure.

Taken together, the Fama–MacBeth results reinforce the main conclusion that SEP sentiment is a meaningful predictor of risk-adjusted returns and downside risk but is largely unrelated to raw returns or systematic risk. The robustness checks confirm that the predictive content of SEP sentiment is not an artifact of the panel structure and persists even after applying cross-sectional regression procedures.

5. Conclusion

This paper examines whether issuance activity in the Korean structured equity product (SEP) market contains information about the future performance and risk of the underlying stocks. Because SEPs are primarily sold to retail investors and issued by sophisticated financial institutions, SEP issuance provides a unique setting in which investor sentiment, product complexity, and issuer timing incentives interact. I construct a stock-level sentiment measure based on issuance amounts of SEPs with down-and-in knock-in put structures—by far the dominant payoff type in the Korean market—and evaluate its predictive content for returns and risk.

The empirical evidence shows that SEP sentiment does not predict raw stock returns or systematic risk, but it has strong explanatory power for market-adjusted returns and downside risk. Panel regressions demonstrate that higher SEP sentiment is associated with significantly lower future abnormal returns, higher realized volatility, and higher probabilities of default. These patterns hold across multiple forecast horizons and are robust to a range of controls, including firm characteristics and news-based sentiment measures. The results are further confirmed using Fama–MacBeth regressions, which show that SEP sentiment continues to predict lower abnormal returns and higher distress risk even after controlling for cross-sectional dependence.

Portfolio analyses reinforce these findings. A sentiment-weighted portfolio formed using monthly SEP sentiment generates persistent negative abnormal returns—approximately –0.6% per month—accumulating to a substantial long-term decline over the 2006–2023 sample period. This consistent underperformance suggests that SEP issuance is closely tied to issuer timing behavior and reflects periods in which underlying stocks are overpriced relative to fundamentals.

Overall, this paper contributes to the literature in several ways. First, it provides new evidence on a feedback channel from complex OTC derivatives to the prices and risks of their underlying assets. Second, it develops a novel issuance-based sentiment measure at the individual stock level, complementing traditional market-level sentiment indices such as Baker and Wurgler (2006, 2007). Third, the results highlight the important role of product complexity and information asymmetry in the structured product market, where sophisticated issuers interact with unsophisticated retail investors. Finally, the findings have practical implications for portfolio construction and risk management: SEP sentiment offers a readily observable signal that anticipates negative risk-adjusted returns and elevated downside risk.

In summary, SEP issuance provides valuable information about the cross-section of expected stock returns in the Korean market. By capturing the timing incentives of issuers and the behavioral biases of retail investors, SEP sentiment emerges as a powerful indicator of future return corrections and distress risk at the individual stock level.

References

Auh, J. K., and W. Cho. 2023. Liquidation cascade and anticipatory trading: Evidence from the structured equity product market. *Review of Asset Pricing Studies* 13:53–98.

Baker, M., and J. Wurgler. 2006. Investor sentiment and the cross-section of stock returns. *Journal of Finance* 61:1645–80.

Baker, M., and J. Wurgler. 2007. Investor sentiment in the stock market. *Journal of Economic Perspectives* 21:129–51.

Bharath, S. T., and T. Shumway. 2008. Forecasting default with the Merton distance to default model. *Review of Financial Studies* 21:1339–69.

Bollerslev, T., G. Tauchen, and H. Zhou. 2009. Expected stock returns and variance risk premia. *Review of Financial Studies* 22:4463–92.

Bollerslev, T., V. Todorov, and L. Xu. 2015. Tail risk premia and return predictability. *Journal of Financial Economics* 118:113–34.

Boudoukh, J., R. Feldman, S. Kogan, and M. Richardson. 2019. Information, trading, and volatility: Evidence from firm-specific news. *Review of Financial Studies* 32:992–1033.

Celerier, C., and B. Vallee. 2017. Catering to investors through security design: Headline rate and complexity. *Quarterly Journal of Economics* 132:1469–508.

Choi, Y. M., Y. S. Kim, and W. S. Liu. 2014. Does the moment timing ability of the issuer exist? Evidence in structured equity products. *Korean Journal of Financial Management* 31:23–53.

Drechsler, I., and A. Yaron. 2011. What's vol got to do with it? *Review of Financial Studies* 24:1–45.

Egan, M. 2019. Brokers versus retail investors: Conflicting interests and dominated products. *Journal of Finance* 74:1217–60.

Engelberg, J. E., and C. A. Parsons. 2011. The causal impact of media in financial markets. *Journal of Finance* 66:67–97.

Engelberg, J. E., A. V. Reed, and M. C. Ringgenberg. 2012. How are shorts informed? Short sellers, news, and information processing. *Journal of Financial Economics* 105:260–78.

Fama, E. F., and J. D. MacBeth. 1973. Risk, return, and equilibrium: Empirical tests. *Journal of Political Economy* 81:607–36.

Financial Supervisory Service. 2025. "Financial Status of Securities Companies' Issuance and Operation of Structured Products in 2024." Press Release. (in Korean)

Henderson, B. J., and N. D. Pearson. 2011. The dark side of financial innovation: A case study of the pricing of a retail financial product. *Journal of Financial Economics* 100:227–47.

Henderson, B. J., N. D. Pearson, and L. Wang. 2023. Retail derivatives and sentiment: A sentiment measure constructed from issuances of retail structured equity products. *Journal of Finance* 78:2365–407.

Ke, Z. T., B. T. Kelly, and D. Xiu. 2019. Predicting returns with text data. NBER Working Paper No. 26186.

Kilic, M., and I. Shaliastovich. 2019. Good and bad variance premia and expected returns. *Management Science* 65:2522–44.

Newey, W. K., and K. D. West. 1987. Hypothesis testing with efficient method of moments estimation. *International Economic Review* 28:777–87.

Pyun, S. 2019. Variance risk in aggregate stock returns and time-varying return predictability. *Journal of Financial Economics* 132:150–74.

Shin, D. 2018. Extrapolation and complexity. Working Paper, Kenan-Flagler Business School.

Tetlock, P. C. 2007. Giving content to investor sentiment: The role of media in the stock market. *Journal of Finance* 62:1139–67.

Tetlock, P. C., M. Saar-Tsechansky, and S. Macskassy. 2008. More than words: Quantifying language to measure firms' fundamentals. *Journal of Finance* 63:1437–67.

Table 1. Data description

Table 1 presents an overview of the data used in this study. Panel A details the construction of the final sample of structured equity product (SEP) contracts, starting from the full universe of issuances and sequentially excluding DLS products, index-linked or foreign-underlying SEPs, and products without a downside knock-in barrier. Panel B summarizes annual issuance activity in the Korean SEP market, reporting the number and total amount of issued contracts, as well as the number and amount of proceeds upon redemption, separately for ELS and ELB products. Panel C describes the characteristics of SEP issuances over time, including the average number of underlying assets per contract, average maturity, and the number of unique underlying stocks.

A. Sample selection

Filter	Sample size	Percentage
Total	155,078	100.0%
Exc: DLS	19,168	12.4%
ELS & ELB	135,910	87.6%
ELS	117,812	76.0%
ELB	18,098	11.7%
Exc: Index/Foreign Contracts	110,092	71.0%
SEP has domestic stocks	25,818	16.6%
ELS	17,576	11.3%
ELB	8,242	5.3%
Exc: Range or Upper KI case	999	0.6%
Only Downside	24,819	16.0%
ELS	16,606	10.7%
ELB	8,213	5.3%

B. Issuance trend of SEPs in Korea

	Issuance Number #				Issuance Amount (Bil KRW)			Proceeds Number #			Proceed Amount (Bil KRW)		
Year	Total	ELS	ELB	ELS(%)	Total	ELS	ELB	Total	ELS	ELB	Total	ELS	ELB
2003	4	4	.	100%	62.0	62.0	.	2	2	.	52.4	52.4	.
2004	9	9	.	100%	130.2	130.2	.	10	10	.	180.2	180.2	.
2005	5	5	.	100%	23.9	23.9	.	9	9	.	100.5	100.5	.
2006	194	194	.	100%	1,186.1	1,186.1	.	197	197	.	1,252.7	1,252.7	.
2007	684	684	.	100%	4,201.9	4,201.9	.	842	842	.	5,110.6	5,110.6	.
2008	705	705	.	100%	2,303.0	2,303.0	.	1,111	1,111	.	5,410.3	5,410.3	.
2009	1,122	1,122	.	100%	2,843.7	2,843.7	.	1,047	1,047	.	4,150.5	4,150.5	.
2010	1,820	1,820	.	100%	4,006.0	4,006.0	.	1,371	1,371	.	2,820.3	2,820.3	.
2011	2,300	2,300	.	100%	3,837.7	3,837.7	.	2,468	2,468	.	4,185.6	4,185.6	.
2012	2,202	2,202	.	100%	2,768.0	2,768.0	.	3,194	3,194	.	4,845.5	4,845.5	.
2013	1,730	1,668	62	96%	1,867.8	1,506.4	361.4	2,998	2,936	62	4,204.2	3,842.8	361.4
2014	975	748	227	77%	1,443.8	568.3	875.5	1,873	1,652	221	2,529.3	1,696.4	832.9
2015	371	182	189	49%	4,139.4	60.3	4,079.0	1,162	905	257	4,943.3	718.1	4,225.3
2016	786	193	593	25%	7,821.7	103.9	7,717.8	1,143	514	629	8,100.5	342.2	7,758.3
2017	813	339	474	42%	6,114.5	416.4	5,698.1	730	253	477	5,869.1	227.8	5,641.3
2018	1,064	436	628	41%	7,721.5	661.6	7,059.9	1,072	479	593	7,638.5	694.9	6,943.6
2019	1,410	689	721	49%	11,156.8	868.4	10,288.3	1,237	581	656	10,718.9	720.5	9,998.4
2020	2,065	1,049	1,016	51%	20,630.5	1,369.1	19,261.4	1,801	792	1,009	20,925.2	1,092.7	19,832.5
2021	2,416	1,272	1,144	53%	20,648.5	1,728.1	18,920.4	2,261	1,031	1,230	21,516.7	1,257.0	20,259.7
2022	1,844	400	1,444	22%	24,986.1	294.0	24,692.1	2,558	1,022	1,536	27,146.2	1,275.3	25,870.9
2023	2,300	585	1,715	25%	27,893.6	620.3	27,273.3	2,609	849	1,760	29,734.5	1,133.7	28,600.8
Total	**24,819**	**16,606**	**8,213**	**-**	**155,787**	**29,560**	**126,227**	**-**	**-**	**-**	**-**	**-**	**-**

C. Characteristics of SEPs issuance

	Average Number of Underlyings			Avg. Maturity (Year)			Number of Unique Underlyings		
Year	Total	ELS	ELB	Total	ELS	ELB	Total	ELS	ELB
2003	1.75	1.75	.	0.81	0.81	.	1	1	.
2004	1.78	1.78	.	1.84	1.84	.	4	4	.
2005	2.00	2.00	.	1.00	1.00	.	2	2	.
2006	2.11	2.11	.	2.01	2.01	.	48	48	.
2007	2.01	2.01	.	2.41	2.41	.	59	59	.
2008	2.00	2.00	.	2.17	2.17	.	55	55	.
2009	1.97	1.97	.	2.26	2.26	.	51	51	.
2010	1.94	1.94	.	2.78	2.78	.	74	74	.
2011	1.94	1.94	.	2.81	2.81	.	80	80	.
2012	1.97	1.97	.	2.85	2.85	.	80	80	.
2013	1.90	1.89	2.19	2.65	2.70	1.27	82	81	23
2014	1.90	1.95	1.72	2.46	2.77	1.45	83	73	26
2015	1.78	1.96	1.62	1.97	2.91	1.06	36	32	11
2016	1.42	1.98	1.24	1.52	2.99	1.04	30	23	13
2017	1.65	2.08	1.34	1.64	2.53	1.00	38	38	9
2018	1.75	2.48	1.24	1.64	2.60	0.97	31	31	7
2019	1.96	2.80	1.17	1.95	2.88	1.07	26	26	4
2020	1.85	2.46	1.22	1.84	2.49	1.16	34	34	4
2021	1.88	2.48	1.22	1.92	2.58	1.19	42	41	5
2022	1.50	2.57	1.20	1.47	2.69	1.13	20	18	4
2023	1.46	2.43	1.12	1.70	2.93	1.27	22	19	12
Average	**1.83**	**2.12**	**1.39**	**1.98**	**2.43**	**1.15**	**42.76**	**41.43**	**10.73**

Table 2. Panel Regression

Table 2 reports the panel regression results examining the predictive power of SEP sentiment for future stock performance and firm-level risk. Panel A presents results using raw stock returns, while Panel B reports results using market-adjusted returns based on the market model. Panel C shows regressions for three-year realized volatility, and Panel D reports results for the probability of default (*PD*), estimated following Bharath and Shumway (2008). Panel E presents regressions for the three-year market beta. Across all panels, SEP sentiment (*SENT*) and the dummy indicator for zero sentiment, $I(SENT = 0)$, are included along with standard control variables—firm size, the stock's return in month t, and firm-level news sentiment. All specifications include firm fixed effects and calendar-month fixed effects, with standard errors clustered at the firm level. Coefficients are annotated with statistical significance levels, where * denotes significance at the 10% level, ** at 5%, and *** at 1%.

Panel A. Raw returns

	(1) *Ret(t+1)*	(2) *Ret(t+2)*	(3) *Ret(t+3)*	(4) *Ret(t+4)*	(5) *Ret(t+5)*	(6) *Ret(t+6)*
SENT	-0.009	-0.005	-0.007	-0.007	-0.009	-0.010
	(-0.569)	(-0.392)	(-0.529)	(-0.537)	(-0.574)	(-0.650)
I(SENT=0)	-0.003	-0.004*	-0.004	-0.005**	-0.003	-0.002
	(-1.338)	(-1.696)	(-1.559)	(-2.005)	(-1.264)	(-0.985)
Size	-0.021***	-0.020***	-0.018***	-0.018***	-0.017***	-0.016***
	(-9.238)	(-9.018)	(-8.896)	(-8.947)	(-7.875)	(-8.019)
Ret(t)	0.015	-0.009	-0.018	0.012	-0.005	-0.015
	(1.187)	(-0.737)	(-1.633)	(1.280)	(-0.503)	(-1.248)
NewsSent	-0.000	-0.001	-0.002	-0.001	-0.002	-0.001
	(-0.437)	(-0.899)	(-1.438)	(-0.935)	(-1.519)	(-1.475)
Constant	0.660***	0.599***	0.466***	0.570***	0.515***	0.532***
	(9.675)	(9.086)	(7.644)	(9.583)	(8.192)	(8.588)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,971	20,953	20,935	20,917	20,899	20,881
Adj. R	0.269	0.268	0.266	0.263	0.262	0.261

Panel B. Market-adjusted returns

	(1) *AdjRet(t+1)*	(2) *AdjRet(t+2)*	(3) *AdjRet(t+3)*	(4) *AdjRet(t+4)*	(5) *AdjRet(t+5)*	(6) *AdjRet(t+6)*
SENT	-0.020**	-0.020**	-0.020**	-0.020**	-0.020***	-0.020***
	(-2.302)	(-2.370)	(-2.442)	(-2.520)	(-2.633)	(-2.746)
I(SENT=0)	0.002	0.002	0.002	0.002	0.002	0.002
	(1.070)	(1.088)	(1.107)	(1.117)	(1.158)	(1.208)
Size	0.015***	0.014***	0.013***	0.012***	0.012***	0.011***
	(10.014)	(9.581)	(9.145)	(8.732)	(8.307)	(7.848)
Ret(t)	0.012***	0.012***	0.011***	0.012***	0.012***	0.012***
	(9.928)	(11.426)	(9.555)	(9.586)	(9.849)	(9.480)
NewsSent	0.001***	0.001***	0.001***	0.001***	0.001**	0.001**
	(3.333)	(3.127)	(2.933)	(2.869)	(2.570)	(2.491)
Constant	-0.421***	-0.398***	-0.376***	-0.354***	-0.334***	-0.313***
	(-10.169)	(-9.751)	(-9.269)	(-8.829)	(-8.384)	(-7.872)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,525	20,527	20,529	20,531	20,533	20,535
Adj. R	0.288	0.264	0.239	0.221	0.201	0.183

Panel C. Realized Volatility (3-Year)

	(1) *Vol(t+1)*	(2) *Vol(t+2)*	(3) *Vol (t+3)*	(4) *Vol(t+4)*	(5) *Vol(t+5)*	(6) *Vol(t+6)*
SENT	0.033***	0.032***	0.032***	0.031***	0.031***	0.031***
	(3.415)	(3.443)	(3.474)	(3.503)	(3.539)	(3.551)
I(SENT=0)	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002
	(-0.483)	(-0.545)	(-0.609)	(-0.686)	(-0.789)	(-0.899)
Size	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(-0.934)	(-0.959)	(-0.959)	(-0.958)	(-0.956)	(-0.942)
Ret(t)	0.008***	0.006***	0.007***	0.007***	0.007***	0.008***
	(3.971)	(2.913)	(3.359)	(2.837)	(2.737)	(2.760)
NewsSent	0.001**	0.001**	0.001**	0.001**	0.002***	0.002**
	(2.205)	(2.378)	(2.445)	(2.479)	(2.629)	(2.581)
Constant	0.160***	0.161***	0.162**	0.162**	0.162**	0.161**
	(2.635)	(2.622)	(2.605)	(2.585)	(2.562)	(2.523)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,525	20,527	20,529	20,531	20,533	20,535
Adj. R	0.381	0.379	0.378	0.377	0.376	0.374

Panel D. Probability of default

	(1) *PD(t+1)*	(2) *PD(t+2)*	(3) *PD(t+3)*	(4) *PD(t+4)*	(5) *PD(t+5)*	(6) *PD(t+6)*
SENT	0.189**	0.189***	0.192***	0.195***	0.199***	0.203***
	(2.584)	(2.688)	(2.810)	(2.959)	(3.137)	(3.316)
I(SENT=0)	-0.021*	-0.018	-0.015	-0.011	-0.008	-0.005
	(-1.692)	(-1.409)	(-1.161)	(-0.856)	(-0.621)	(-0.376)
Size	-0.095***	-0.083***	-0.073***	-0.062***	-0.052***	-0.043***
	(-6.911)	(-6.188)	(-5.434)	(-4.648)	(-3.993)	(-3.338)
Ret(t)	-0.107***	-0.103***	-0.103***	-0.114***	-0.101***	-0.112***
	(-8.315)	(-8.969)	(-8.310)	(-9.044)	(-8.038)	(-8.500)
NewsSent	-0.000	-0.001	-0.001	-0.002	-0.003	-0.004
	(-0.079)	(-0.211)	(-0.340)	(-0.543)	(-0.910)	(-1.099)
Constant	2.767***	2.451***	2.143***	1.831***	1.549***	1.286***
	(7.173)	(6.494)	(5.680)	(4.824)	(4.129)	(3.471)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,525	20,527	20,529	20,531	20,533	20,535
Adj. R	0.197	0.174	0.157	0.143	0.129	0.120

Panel E. Market Beta

	(1) *Beta(t+1)*	(2) *Beta(t+2)*	(3) *Beta(t+3)*	(4) *Beta(t+4)*	(5) *Beta(t+5)*	(6) *Beta(t+6)*
SENT	0.611	0.624	0.636	0.645	0.655	0.667
	(0.398)	(0.403)	(0.408)	(0.410)	(0.413)	(0.416)
I(SENT=0)	-0.069	-0.073	-0.075	-0.079	-0.082	-0.085
	(0.052)	(0.053)	(0.054)	(0.054)	(0.054)	(0.054)
Size	-0.087**	-0.085**	-0.083*	-0.081*	-0.078*	-0.075*
	(0.042)	(0.043)	(0.043)	(0.043)	(0.044)	(0.044)
Ret(t)	0.086**	0.067*	0.087***	0.074**	0.056*	0.060*
	(0.036)	(0.035)	(0.033)	(0.032)	(0.033)	(0.035)
NewsSent	-0.007	-0.005	-0.005	-0.006	-0.005	-0.004
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Constant	3.588***	3.547***	3.479***	3.431***	3.344***	3.252**
	(1.215)	(1.231)	(1.249)	(1.260)	(1.270)	(1.276)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,525	20,527	20,529	20,531	20,533	20,535
Adj. R	0.031	0.033	0.035	0.037	0.039	0.041

Table 3. Fama-MacBeth Regression

Table 3 reports the Fama–MacBeth (1973) cross-sectional regression results examining whether SEP sentiment predicts future stock returns and firm-level risk. Panel A presents results for raw returns, and Panel B reports results for market-adjusted returns based on the market model. Panel C shows regressions for three-year realized volatility, Panel D for the probability of default (PD), and Panel E for the three-year market beta. Each monthly cross-sectional regression includes the SEP sentiment measure (*SENT*), an indicator variable for zero sentiment $I(SENT = 0)$, and control variables—firm size, the stock's return in month t, and firm-level news sentiment. The average coefficients and Newey–West corrected t-statistics (lag 4) are reported across all forecast horizons. Coefficients are annotated with statistical significance, where * denotes significance at the 10% level, ** at 5%, and *** at 1%.

Panel A. Raw returns

	(1) *Ret(t+1)*	(2) *Ret(t+2)*	(3) *Ret(t+3)*	(4) *Ret(t+4)*	(5) *Ret(t+5)*	(6) *Ret(t+6)*
SENT	-0.032	-0.041	-0.023	-0.036	-0.027	-0.034
	(-0.758)	(-1.008)	(-0.499)	(-0.812)	(-0.616)	(-0.890)
I(SENT=0)	-0.006**	-0.007**	-0.004**	-0.005**	-0.004	-0.003
	(-2.069)	(-2.529)	(-2.135)	(-2.172)	(-1.553)	(-1.560)
Size	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(-1.376)	(-1.566)	(-1.371)	(-1.296)	(-1.157)	(-1.255)
Ret(t)	0.034**	0.008	0.002	0.016	0.004	0.000
	(2.147)	(0.582)	(0.114)	(1.030)	(0.367)	(0.021)
NewsSent	-0.002***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
	(-3.039)	(-2.707)	(-3.173)	(-3.991)	(-3.483)	(-2.917)
Constant	0.059	0.070*	0.059	0.063	0.052	0.054
	(1.467)	(1.722)	(1.511)	(1.451)	(1.300)	(1.411)
Observations	20,971	20,953	20,935	20,917	20,899	20,881
Avg. R	0.110	0.102	0.100	0.097	0.097	0.094

Panel B. Market-adjusted returns

	(1) *AdjRet(t+1)*	(2) *AdjRet(t+2)*	(3) *AdjRet(t+3)*	(4) *AdjRet(t+4)*	(5) *AdjRet(t+5)*	(6) *AdjRet(t+6)*
SENT	-0.151***	-0.150***	-0.148***	-0.146***	-0.142***	-0.140***
	(-5.831)	(-5.839)	(-5.809)	(-5.801)	(-5.767)	(-5.785)
I(SENT=0)	0.001*	0.001	0.001	0.001	0.001	0.001
	(1.855)	(1.641)	(1.499)	(1.386)	(1.282)	(1.208)
Size	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***
	(21.725)	(20.481)	(19.260)	(17.984)	(17.015)	(16.406)
Ret(t)	0.022***	0.023***	0.022***	0.022***	0.023***	0.022***
	(7.154)	(7.112)	(6.715)	(7.020)	(6.843)	(6.933)
NewsSent	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(4.877)	(4.825)	(4.642)	(4.323)	(3.930)	(3.660)
Constant	-0.153***	-0.150***	-0.147***	-0.145***	-0.142***	-0.140***
	(-22.386)	(-21.016)	(-19.702)	(-18.337)	(-17.359)	(-16.738)
Observations	20,525	20,527	20,529	20,531	20,533	20,535
Avg. R	0.269	0.261	0.255	0.247	0.245	0.239

Panel C. Realized Volatility (3-Year)

	(1) *Vol(t+1)*	(2) *Vol(t+2)*	(3) *Vol (t+3)*	(4) *Vol(t+4)*	(5) *Vol(t+5)*	(6) *Vol(t+6)*
SENT	-0.091**	-0.094**	-0.098***	-0.102***	-0.107***	-0.110***
	(-2.306)	(-2.463)	(-2.643)	(-2.851)	(-3.042)	(-3.232)
I(SENT=0)	-0.005*	-0.005**	-0.005**	-0.005**	-0.005**	-0.005**
	(-1.947)	(-1.983)	(-2.023)	(-2.074)	(-2.160)	(-2.228)
Size	-0.010***	-0.010***	-0.010***	-0.010***	-0.010***	-0.010***
	(-10.348)	(-10.407)	(-10.454)	(-10.476)	(-10.490)	(-10.520)
Ret(t)	0.003	0.001	0.003	0.002	0.002	0.002
	(0.515)	(0.280)	(0.484)	(0.332)	(0.328)	(0.390)
NewsSent	0.000	0.000	0.000	0.000	0.001	0.001*
	(0.801)	(1.063)	(1.319)	(1.466)	(1.641)	(1.756)
Constant	0.389***	0.390***	0.391***	0.392***	0.392***	0.393***
	(13.273)	(13.355)	(13.418)	(13.451)	(13.478)	(13.517)
Observations	20,525	20,527	20,529	20,531	20,533	20,535
Avg. R	0.295	0.295	0.296	0.297	0.297	0.297

Panel D. Probability of default

	(1) *PD(t+1)*	(2) *PD(t+2)*	(3) *PD(t+3)*	(4) *PD(t+4)*	(5) *PD(t+5)*	(6) *PD(t+6)*
SENT	1.301***	1.278***	1.249***	1.222***	1.193***	1.166***
	(5.125)	(5.124)	(5.222)	(5.246)	(5.144)	(5.049)
I(SENT=0)	-0.029***	-0.026***	-0.023***	-0.021***	-0.018**	-0.016**
	(-4.210)	(-3.808)	(-3.451)	(-2.999)	(-2.519)	(-2.202)
Size	-0.057***	-0.054***	-0.053***	-0.051***	-0.049***	-0.048***
	(-10.434)	(-10.387)	(-10.408)	(-10.369)	(-10.215)	(-10.301)
Ret(t)	-0.153***	-0.146***	-0.147***	-0.160***	-0.143***	-0.146***
	(-6.870)	(-6.564)	(-6.610)	(-6.864)	(-6.361)	(-6.645)
NewsSent	-0.010**	-0.010**	-0.010**	-0.010**	-0.011**	-0.011**
	(-2.526)	(-2.409)	(-2.391)	(-2.228)	(-2.399)	(-2.501)
Constant	1.737***	1.673***	1.622***	1.569***	1.524***	1.485***
	(10.870)	(10.829)	(10.847)	(10.812)	(10.648)	(10.747)
Observations	20,525	20,527	20,529	20,531	20,533	20,535
Avg. R	0.193	0.186	0.179	0.173	0.168	0.163

Panel E. Market beta

	(1) *Beta(t+1)*	(2) *Beta(t+2)*	(3) *Beta(t+3)*	(4) *Beta(t+4)*	(5) *Beta(t+5)*	(6) *Beta(t+6)*
SENT	1.328	1.366	1.380	1.388	1.397	1.415
	(1.224)	(1.214)	(1.196)	(1.185)	(1.170)	(1.157)
I(SENT=0)	-0.083**	-0.084**	-0.084**	-0.086**	-0.089**	-0.090**
	(0.042)	(0.042)	(0.041)	(0.042)	(0.042)	(0.042)
Size	-0.082***	-0.082***	-0.082***	-0.081***	-0.081***	-0.081***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Ret(t)	-0.063	-0.086	-0.070	-0.082	-0.105	-0.098
	(0.108)	(0.111)	(0.111)	(0.110)	(0.109)	(0.110)
NewsSent	-0.024***	-0.022***	-0.021***	-0.022***	-0.020**	-0.020**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Constant	3.430***	3.424***	3.408***	3.407***	3.405***	3.400***
	(0.382)	(0.381)	(0.383)	(0.385)	(0.386)	(0.387)
Observations	20525	20527	20529	20531	20533	20535
Avg. R	0.191	0.192	0.193	0.193	0.193	0.193

Figure 1. Yearly structured equity product issuance, proceeds, and number of underlying stocks

Figure 1 displays annual issuance amounts and proceeds of structured equity products (SEPs) in Korea from 2003 to 2023, along with the number of underlying stocks referenced by issued SEPs. The white bars represent total issuance amounts, while the black bars denote proceeds upon redemption (left axis). The dotted line (right axis) tracks the number of distinct underlying stocks used in SEP issuances. The figure shows a sharp increase in issuance activity over time, particularly after 2018, alongside a decline in the number of underlying stocks, indicating increasing concentration of SEP issuances on a smaller set of stocks.

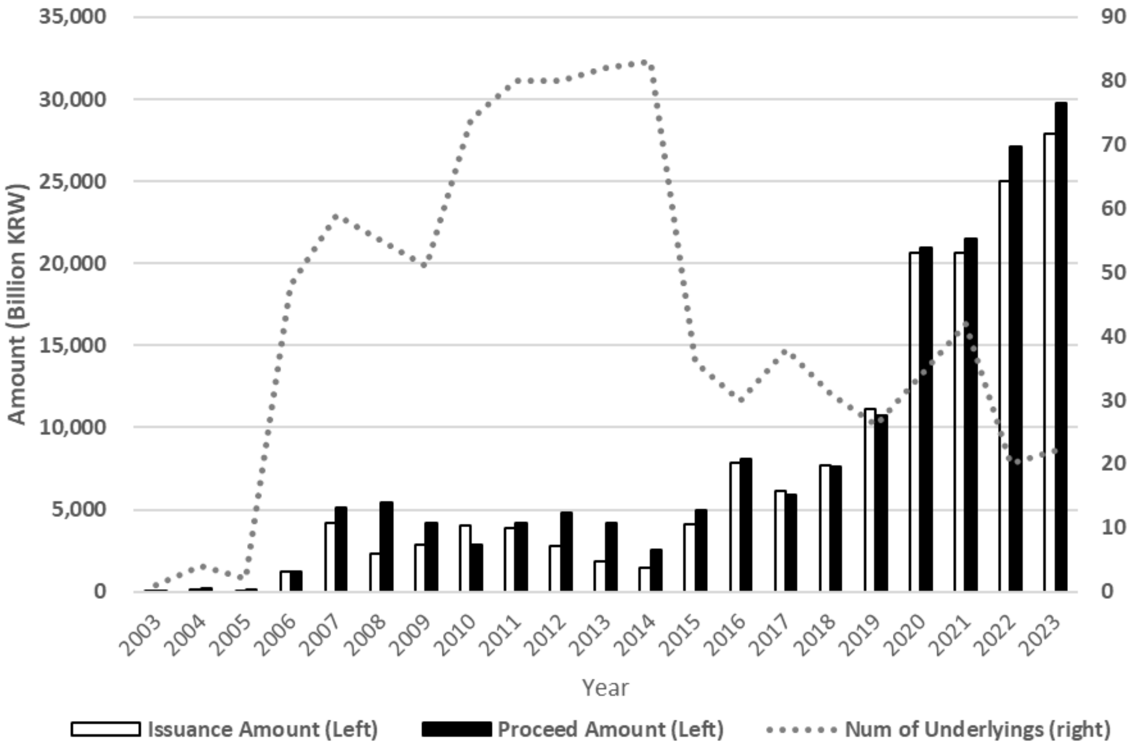

Figure 2. Monthly cumulative abnormal returns by the SEP-sentiment portfolio from September 2006 to December 2023

Figure 2 plots the cumulative abnormal returns (CAR) of the SEP-sentiment-weighted portfolio over the period September 2006 to December 2023. Abnormal returns are computed using the market model, and cumulative returns are formed by compounding monthly abnormal returns. The portfolio exhibits a persistent and monotonic decline, reaching approximately –72% by the end of the sample period, indicating that stocks with high SEP sentiment systematically underperform after issuance. The dashed red line represents the zero benchmark.