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Borrowing Costs as a Return Factor: Evidence from Daily U.S. Equity Data

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Abstract. This paper examines whether stock borrowing costs contain information about daily equity returns beyond standard risk factors. The study merges daily U.S. stock returns from CRSP with daily borrowing costs from Markit using a harmonized CUSIP8 identifier, and adds daily Fama-French factors from the Kenneth R. French Data Library. The study constructs a daily borrowing-cost factor by going long high-borrow-cost stocks and short low-borrow-cost stocks, rebalanced each day. In firm fixed-effects panel regressions of stock excess returns on the Fama-French three factors and the borrowing-cost factor, the loading on the borrowing-cost factor is positive and highly statistically significant. The results suggest borrowing costs are systematically related to daily excess returns, consistent with the idea that short-selling frictions are relevant for asset pricing. This finding fills the gap in the exploration of short-selling related friction factors in short-term asset pricing research, and also provides new empirical evidence on the daily dimension for understanding the linkage between micro transaction costs and stock returns, which has important reference value for the improvement of asset pricing theory and the formulation of actual investment strategies.

Keywords: borrowing costs, short-selling frictions, asset pricing, Fama-French

1. Introduction

Short selling is not frictionless. In practice, investors face securities lending fees and constraints that vary across stocks and over time. These borrowing costs may reflect short-selling demand, limited lendable supply, and other market frictions [1]. This paper tests whether borrowing costs are related to daily stock excess returns after controlling for standard risk factors. Traditional asset pricing research mostly focuses on classic factors such as market, scale, and value, but pays insufficient attention to micro friction factors such as margin financing cost in the process of short selling [2]. The existing research is mostly based on low-frequency data, such as monthly and quarterly, and the analysis of daily high-frequency data is relatively scarce [3]. This paper carries out an in-depth empirical test on this research gap, trying to reveal the mechanism of margin financing cost in short-term earnings pricing.

The study constructs a daily long-short factor based on borrowing costs and estimates stock-level panel regressions that include the Fama-French three factors [4]. The main finding is that the borrowing-cost factor remains strongly significant in a firm fixed-effects specification, suggesting

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that borrowing costs capture a systematic component of return variation not fully absorbed by traditional factors. This conclusion breaks through the interpretation boundary of the traditional factor model, shows that the cost of margin trading brought about by short-selling friction is not a random microtransaction cost, but a systematic factor affecting returns, and also provides a new direction and ideas for the follow-up expansion of asset pricing factors.

2. Data and sample construction

This study combines three datasets at a daily frequency: CRSP is for daily stock returns. Each observation contains the trading date and a security identifier together with the daily return. Markit is for the daily borrowing cost measured by the one-day indicative borrow fee. To ensure consistent matching across datasets, identifiers and dates are cleaned and standardized before merging. Dates are parsed into a common date format, and the security identifier is harmonized by constructing CUSIP8.

The main panel dataset is constructed via an inner join between CRSP daily returns and Markit borrowing cost. Observations with missing returns or missing borrowing costs are removed. The factor data are merged by date. The inner join method ensures that each observation in the final sample simultaneously contains valid information on stock returns and securities lending costs. The elimination of missing values further guarantees data validity, and the merging of factor data by date achieves accurate matching between individual stock data and market factor data, thus providing a sound data structure for subsequent factor regression analyses [5].

The sample period spans from January 31, 2024, to December 31, 2024. The sample period covers the trading days of the whole year of 2024, which can reflect the relationship between the cost of margin trading and stock returns in different market environments in the year [6]. The sample consists of over 200,000 observations and 5,523 firms, which ensures the representativeness of the research sample and the validity of statistical tests. This effectively reduces statistical biases caused by small samples and makes the research conclusions more convincing.

3. Variables and empirical strategy

Excess return is a core explained variable in asset pricing research. By excluding the impact of risk-free returns, it can more accurately reflect the incremental returns of stocks driven by market risks and other idiosyncratic risks, and realize the comparability of returns across different stocks and time periods [7]. It is a standard variable setting method to test the pricing power of various risk factors [8]. This classic definition has formed a consensus in academia and industry, and the use of this definition can make the research results consistent with the existing literature, which is convenient for follow-up research comparison and conclusion reference [9].

Let BC(i,t) denote the daily borrowing cost for stock i on day t, measured by Markit's one-day indicative borrow fee. Markit's one-day reference margin rate is based on the actual transaction quotation and transaction data in the market, which can reflect the cost of margin lending on that day in real time. It is a high-quality indicator to measure the cost of short-term margin trading. Compared with the annual and quarterly low-frequency margin trading cost indicators, its daily frequency is more in line with the research theme of short-term income pricing in this paper. Choosing this indicator as the proxy variable of securities lending cost not only ensures the timeliness and accuracy of the variable, but also enables the change of securities lending cost to form an accurate time match with the change of daily stock returns [10].

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On each trading day t, stocks are sorted into deciles based on BC(i,t). The borrowing-cost factor is constructed as a long-short portfolio: High-borrow-cost portfolio: top decile (decile 10). Low-borrow-cost portfolio: bottom decile (decile 1). Dividing stocks into 10 quantile groups according to the cost of margin trading is a classic practice in the construction of financial factors, which can effectively distinguish stock groups with different cost levels of margin trading, and choosing the highest and lowest quantiles to build a long short portfolio can maximize the difference in the cost of margin trading between the two groups of stocks, more clearly capture the impact of margin trading costs on stock returns, and avoid the problem of insignificant factor returns caused by too small grouping differences. As seen in model (1), the study first regresses the borrowing-cost factor on the Fama-French three factors:

$$BCF(t) = \alpha + \beta_M (M_{kt} - R_F)(t) + \beta_S SMB(t) + \beta_H HML(t) + \varepsilon_t \quad (1)$$

The intercept α tests whether the factor has abnormal returns after controlling for FF3. If the intercept term is significantly not 0, it shows that the cost factor of margin trading contains income information that can not be explained by traditional factors, and has independent pricing power; If the intercept term is not significant, it shows that the income of the cost factor of margin trading can be fully explained by the traditional factor, and its uniqueness is weak. This test method can intuitively judge the research value of the cost factor of margin trading, and is the key judgment basis for screening effective asset pricing factors. As seen in model (2), the main test uses stock-level panel regressions of daily excess returns:

$$r_e(i,t) = \alpha + \beta_M (M_{kt} - R_F)(t) + \beta_S SMB(t) + \beta_H HML(t) + \gamma BCF(t) + u(i,t) \quad (2)$$

Panel regression at the stock level can use the information of cross section dimension (different stocks) and the time dimension at the same time. Compared with simple time series regression or cross-sectional regression, it contains more abundant sample information and can more comprehensively test the explanatory power of margin financing cost factors on individual stock excess returns. By incorporating the Fama-French factor and the margin financing cost factor into the model at the same time, the independent pricing effect of the margin financing cost factor can be accurately identified on the premise of controlling the impact of traditional factors.

4. Results

4.1. Panel regression

Table 1 reports results from a regression of daily excess returns on the Fama-French three factors and the borrowing-cost factor. The unbalanced panel contains 5,523 firms and 203,186 firm-day observations (1 to 83 trading days per firm). In this study, the use of unbalanced panels is due to the suspension of trading and data loss of some stocks during the sample period, which is a common phenomenon in the study of high-frequency financial data. The rational use of unbalanced panels can maximize the use of effective sample information and avoid sample losses and conclusion errors caused by forced balancing panels. The observation period distribution of 1-83 trading days for each enterprise also reflects the actual situation of stock trading in the sample.

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Table 1. Variable coefficient

	Coefficient	t-stat
Mkt-RF	0.0079	32.95
SMB	0.0078	27.01
HML	0.0024	11.92
BCF	0.2131	19.43

The dependent variable is daily excess return re(i,t). The regression includes firm fixed effects. t-statistics are shown in parentheses. Within R^2 = 0.0199. F-statistic = 1000.76 ($p < 0.001$). The loading on the borrowing-cost factor is 0.2131 with a standard error of 0.0110 (t=19.43), significant at the 1% level. This implies that movements in the borrowing-cost factor are strongly associated with contemporaneous movements in stock excess returns even after controlling for market, size, and value factors and firm fixed effects. From the economic point of view, the coefficient of 0.2131 shows that for every unit change in the cost factor of margin trading, the average daily excess return of stocks changes by 0.2131 units, indicating that the cost factor of margin trading has a significant positive impact on the short-term return of stocks. This significant impact in the economic sense and statistical significance confirm each other, making the research conclusion more practical. At the same time, the coefficient of the Fama-French three-factor model is significantly positive, which is consistent with the conclusions of existing asset pricing studies, and also verifies the rationality of the regression results in this paper.

4.2. Summary statistics

Daily stock returns show substantial dispersion. The mean daily return is 0.105%, and the median is -0.089%, with extreme values from -98.5% to 918.6%. The daily risk-free rate has a mean of 0.0119% and is close to zero for most days. The large dispersion of daily stock returns is a typical feature of high-frequency financial data. Affected by short-term factors such as company announcements, market news, and trading behavior on that day, the existence of extreme values also reflects the extreme trading situation in the market, while the deviation between the mean and median shows that the distribution of daily stock returns is not symmetrical and has certain skewness characteristics. The average risk-free return is very low and close to zero, and also shows that excluding risk-free return has little impact on stock returns, and the change of stock daily returns is mainly driven by its own risk factors and market factors.

5. Discussion and limitations

Overall, the results suggest borrowing costs capture a component of return variation not fully explained by standard factors. One interpretation is that borrowing costs proxy for short-selling frictions and limits to arbitrage that matter for prices. High margin financing costs often mean that the demand for short selling of stocks is strong. The supply of loanable stocks is insufficient, the friction of short selling is large, and arbitrageurs find it difficult to correct the wrong pricing of stocks through short selling, so that stock returns include additional returns due to arbitrage restrictions. This logic is also consistent with the limited arbitrage theory, which provides a solid theoretical support for the empirical results of this paper. At the same time, this interpretation also connects the micro transaction cost of margin trading with the macro asset pricing theory, enriching the empirical evidence of the limited arbitrage theory.

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There are several limitations. First, the analysis uses daily returns, which are noisy and may obscure longer-horizon effects. Second, borrowing cost is proxied by an indicative fee, which may not match actual transaction-level costs. Third, the panel is unbalanced, and some firms appear for short windows, which may raise sample-selection concerns. The noise problem of daily data stems from random fluctuations in short-term trading, which may interfere with the identification of the real relationship between the cost of margin trading and stock returns. The deviation between the reference margin rate and the actual transaction cost stems from the difference between the compilation of indicators and the actual transaction, and the actual margin cost may also include handling fees, margin and other expenses; Enterprises with short observation windows may have some characteristics, and their securities lending costs and income characteristics are different from those of other enterprises, resulting in sample selection bias.

6. Conclusion

This study examines whether stock borrowing costs contain explanatory power for equity returns beyond standard risk factors. Using daily data from CRSP, the Kenneth R. French Data Library, and Markit, the study constructs a borrowing-cost factor and evaluates its relevance within a Fama-French framework. The borrowing-cost factor is strongly associated with stock excess returns even after controlling for market, size, and value factors and accounting for firm fixed effects. The results are consistent with the view that short-selling frictions are relevant for empirical asset pricing.

Future work could test weekly or monthly horizons, alternative borrowing cost measures, and interactions with market stress periods. The study based on longer time horizons can eliminate the noise of daily data and more clearly identify the long-term pricing effect of margin trading costs. Using alternative indicators, such as actual transaction-based borrowing fees and comprehensive margin costs, can verify the robustness of the research conclusions. Analyzing interactive effects during market stress periods can explore whether the pricing power of margin trading costs varies across different market conditions, further enrich the research content of the relationship between margin financing costs and asset pricing, and make the research conclusions more comprehensive.

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