Lottery Preference and Stock Return

Who gambles in the stock market
Alok Kumar, The Journal of Finance, 2009 08

Maxing out: Stocks as lotteries and the cross-section of expected returns
Turan G. Bali, et al., Journal of Financial Economics, 2010 08

Lottery Preference and Anomalies
Lei Jiang et al., Working paper, 2020 05

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1. Introduction

Background

1. The desire to gamble is deep-rooted in the human psyche. Markowitz (1952) conjectures that some investors might prefer to “take large chances of a small loss for a small chance of a large gain.”
2. Thaler and Ziemba (1988) find two prominent examples that are the favorite-longshot bias in horsetrack betting, and the popularity of lottery games despite the prevalence of negative expected returns.

1. Introduction

Motivation

1. It has been difficult to gather direct evidence of gambling-motivated investment decisions. (Kumar, 2009)
2. There is no study on the relationship between extreme positive return and stock future return. (Bali et al., 2010)
3. The explanatory power of lottery preference on anomalies has received little attention. (Jiang et al., 2020)

1. Introduction

Research question

1. Do investors have lottery preference?

   Yes

2. Is the relationship between lottery characteristics of stock and future earnings positive or negative?

   Negative

3. Do lottery factors have explanatory power for other anomalies?

   Yes

1. Introduction

Related researches

1. People’s risk-taking propensity in one setting predicts risky behavior in other(Barsky et al. 1997)

2. Barberis and Huang (2008) find that investors might overweight low probability events and exhibit a preference for stocks with positive skewness

3. The cumulative prospect theory indicates that errors in the probability weighting of investors cause them to over-value stocks that have a small probability of a large positive return (Tversky and Kahneman, 1992).

4. Daniel et al(2020) show that their risk-and-behavioral model outperforms both standard and recent enhanced factor models in explaining anomalies.

1. Introduction

Research Contents

1. By comparing the stock preference of individual investors and institutional investors, it is found that individual investors have stronger preference for stocks with lottery characteristics.

2. We examine the relationship between the lottery characteristics of stocks and cross-sectional returns.

3. We construct the lottery factor using both PLS and PCA combined approach, finding that the behavioral-motivated lottery factor adds significant explanatory power to the commonly-used factors.

1. Introduction

Contribution

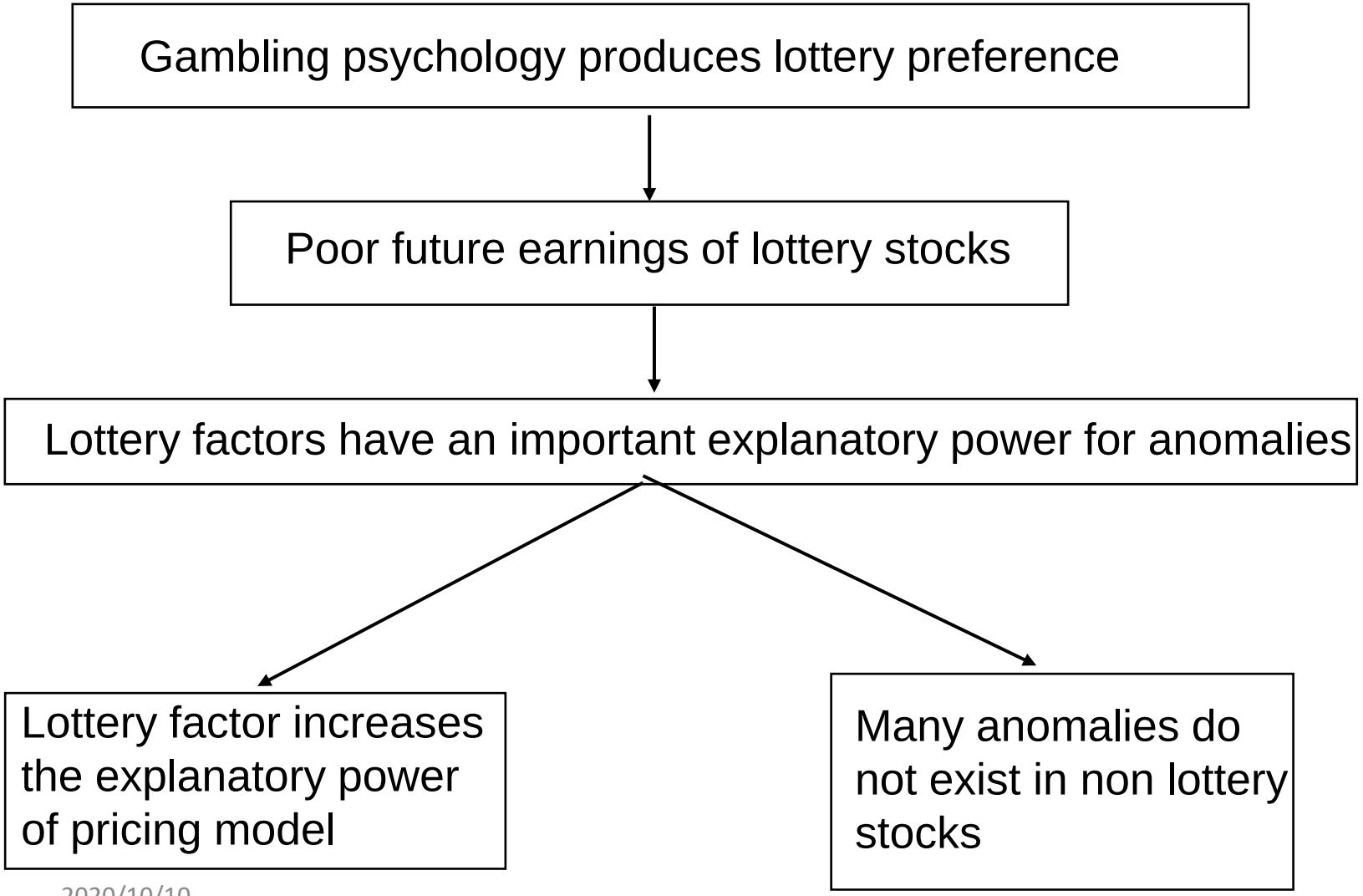
1. Kumar (2009) first proved that individual investors have gambling preference based on empirical results.

2. Bali et al. (2010) proved that extreme positive returns (MAX) is a good index to describe the lottery characteristics of stocks.

3. Jiang et al. (2020) suggested that lottery factor is an important factor to explain anomalies.

1. Introduction

Framework



2. Research design: Variable

Index of lottery stock:
Low price: investors are searching for cheap bets.

High skew: investors are likely to be attracted more toward stocks that occasionally generate extreme positive returns.

High idiosyncratic volatility: investors might believe that the extreme return events observed in the past are more likely to be repeated.

Extreme positive returns: Investors tend to think that stocks with extreme positive returns should also be more likely to exhibit this phenomenon in the future.

2. Research design: Variable

Abbreviation	Description	Authors, Date
$SKEW$	Skewness of daily return distribution	Arditti (1967, 1971)
$ISKEW$	Idiosyncratic skewness of daily return distribution	Harvey and Siddique (2000)
MAX	Maximum daily return within the month	Bali, Cakici, and Whitelaw (2011)
$MAX5$	Average of the 5 highest daily returns within the month	Bali, Cakici, and Whitelaw (2011)
$LTRY$	Lottery index	Kumar, Page, and Spalt (2016);Bali, Hirshleifer, Peng, and Tang (2020)
$MAXMIN$	Difference between the maximum and minimum daily return	Jiang, Wen, Zhou, and Zhu (2020)
$ESKEW$	Expected skewness	Boyer, Mitton, and Vorkink (2010)
$EISKEW$	Expected idiosyncratic skewness	Boyer, Mitton, and Vorkink (2010)
$SK_{0.90}$	Quantile-based skewness at 0.90	Ghysels, Plazzi, and Valkanov (2016)
$ISK_{0.90}$	Idiosyncratic quantile-based skewness at 0.90	Ghysels, Plazzi, and Valkanov (2016)
$SK_{0.95}$	Quantile-based skewness at 0.95	Ghysels, Plazzi, and Valkanov (2016)
$ISK_{0.95}$	Idiosyncratic quantile-based skewness at 0.95	Ghysels, Plazzi, and Valkanov (2016)
SK_{INT}	Quantile-based skewness by integrating over all quantiles	Ghysels, Plazzi, and Valkanov (2016)
ISK_{INT}	Idiosyncratic quantile-based skewness by integrating over all quantiles	Ghysels, Plazzi, and Valkanov (2016)
$E_{\varphi 2}$	Excess tail probability of stock return distribution	Jiang, Wu, Zhou, and Zhu (2020)
$IE_{\varphi 2}$	Idiosyncratic excess tail probability of stock return distribution	Jiang, Wu, Zhou, and Zhu (2020)

2. Research design: Variable

Aggregate weight in lottery-type stocks:

The aggregate investor preference for stock i in month t is the unexpected portfolio weight allocated to that stock. Specifically, this measure is defined as

$$EW_{ipt} = \frac{w_{ipt} - w_{imt}}{w_{imt}} * 100$$

Here, w_{ipt} is the actual weight assigned to stock i in the aggregate investor portfolio p in month t, and w_{imt} is the weight of stock i in the aggregate market portfolio in month t.

2. Research design: Data

Data Source： U.S. discount brokerage house、CRSP、 Compustat

Period： 1991 to 1996 daily data(Kumar, 2009),
1926 to 2005 daily data(Bali et al., 2010),
1962 to 2018 daily data and monthly time-series returns for the 32 anomalies from Novy-Marx's website (Jiang et al., 2020).

Sample: All New York Stock Exchange (NYSE), American Stock Exchange (Amex), and Nasdaq.

2. Research design: Method

PLS-PCA approach

For each lottery-preference proxy x_i, we run time-series regressions of $x_{i,t-1}$ on a constant and the realized jth anomaly return $Anom_{t,j}$,

$$x_{i,t-1} = \pi_{i,0,t-1} + \pi_{i,t-1} * Anom_{t,j} + u_{i,t-1,j}\,, \qquad t = 1,2,\dots,T \qquad (1)$$

We then run T cross-sectional regressions:

$$x_{i,t} = c_{t,j} + L_{t,j}^{PLS} * \hat{\pi}_{i,j} + v_{i,t,j}\,, \qquad i = 1,\dots,N \qquad (2)$$

where $L_{t,j}^{PLS}$ is the estimated lottery-preference for the jth anomaly return.

$$L_j^{PLS} = \left(L_{1,j}^{PLS}, \dots, L_{T,j}^{PLS} \right)' \qquad (3)$$

can be expressed as a linear combination of all $x_{i,t}$

2. Research design: Method

PLS-PCA approach

we then use the first principal component (PC) of the J lottery-preference indexes as the measure of lottery-preference factor.

$$LP_t = L_t^{PLS} * V_{max} \qquad (4)$$

where $L_t^{PLS} = (L_{t,1}^{PLS}, \dots, L_{t,J}^{PLS})$ and V_{max} is the eigenvector corresponding to the largest eigenvalue of the covariance matrix of vectors: $L_1^{PLS}, \dots, L_J^{PLS}$.

3. Empirical result: Characteristics of lottery stocks

Measure	Lottery-Type	Nonlottery-Type	Others
Number of stocks	1,553	1,533	8,945
Percentage of the market	1.25%	50.87%	47.88%
Total volatility	78.57	3.29	22.14
Idiosyncratic volatility	75.56	2.96	20.36
Total skewness	0.330	0.175	0.237
Systematic skewness	−0.202	−0.061	−0.110
Idiosyncratic skewness	0.731	−0.041	0.332
Stock price	$3.83	$31.68	$17.51
Market beta	1.090	0.906	0.897
Firm size (in million $)	31.41	1650.87	539.66
SMB beta	0.804	0.378	0.617
Book-to-market ratio	0.681	0.314	0.348
HML beta	0.272	0.186	0.151
Past 12-month return	16.52%	20.22%	18.14%
Amihud illiquidity	70.16	0.465	15.13
Monthly volume turnover	84.72%	64.16%	57.90%
Firm age (in years)	5.78	12.10	11.87
Percentage dividend paying	3.37%	44.59%	57.03%
Percentage without analyst coverage	71.30%	21.19%	36.87%
Mean number of analysts	3.93	12.40	6.49
Percentage institutional ownership	7.35%	49.34%	30.09%

The summary statistics indicate that lottery-type stocks have low market capitalization, a relatively high book-to-market ratio, lower liquidity, younger, low analyst coverage, and mostly non dividend-paying.

3. Empirical result: Lottery preference of investors

Panel A: Baseline Estimates

	Individuals					Institutions		
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.003	0.003	0.007			−0.041		
	(10.67)	(9.09)	(3.23)			(−6.31)		
Idiosyncratic or total volatility	0.056	0.055	0.049	0.059	0.046	−0.044	−0.048	−0.051
	(7.45)	(7.24)	(5.13)	(8.85)	(5.66)	(−4.37)	(−5.32)	(−5.78)
Idiosyncratic or total skewness	0.047	0.049	0.038	0.052	0.049	−0.071	−0.070	−0.066
	(5.06)	(5.27)	(5.01)	(9.28)	(6.14)	(−5.55)	(−4.04)	(−3.69)
Stock price	−0.191	−0.190	−0.137	−0.108	−0.124	0.061	0.062	0.059
	(−8.99)	(−9.93)	(−9.77)	(−7.97)	(−8.73)	(5.64)	(8.26)	(8.51)
Market beta			0.111	0.155	0.100	−0.006	−0.008	0.002
			(6.79)	(8.69)	(8.03)	(−2.47)	(−2.18)	(0.37)
Log(firm size)			−0.189	−0.200	−0.183	0.185	0.220	0.156
			(−10.41)	(−10.79)	(−8.81)	(4.95)	(10.57)	(3.16)
Book-to-market ratio			−0.071	−0.086	−0.064	0.052	0.058	0.065
			(−7.63)	(−10.92)	(−6.32)	(4.12)	(5.58)	(3.28)
Past 12-month stock return			−0.015	−0.013	−0.021	0.024	0.030	0.012
			(−2.51)	(−1.95)	(−2.53)	(3.40)	(6.96)	(1.87)
Systematic skewness			−0.012	−0.017	−0.011	0.020	0.014	0.001

The stock-level regression estimates indicate that individual investors exhibit a strong aggregate preference for stocks with lottery features.
Unlike individual investors, institutions exhibit a relative aversion for stocks with lottery features.

3. Empirical result: Return of lottery stocks

Portfolio	MeanRet	*SD*	CharAdjRet	Alpha	RMRF	SMB	HML	UMD	Adj. R^2
Lottery (L)	0.472	7.934	−0.375	−0.552	1.204	1.130	−0.049	−0.442	0.880
			(−2.95)	(−3.22)	(18.90)	(15.15)	(−0.78)	(−8.05)	
Nonlottery (NL)	1.135	4.025	0.040	0.041	0.920	−0.123	0.102	−0.008	0.963
			(0.47)	(0.84)	(28.39)	(−8.16)	(5.77)	(−0.82)	
Others (O)	1.033	4.644	−0.026	−0.033	0.959	0.099	−0.103	−0.010	0.981
			(−1.12)	(−0.83)	(18.39)	(7.90)	(−6.82)	(−1.19)	
L–NL	−0.663	5.882	−0.415	−0.592	0.284	1.253	−0.151	−0.433	0.728
	(−2.95)		(−3.14)	(−3.12)	(6.15)	(12.13)	(−2.17)	(−6.65)	
L–O	−0.562	4.846	−0.349	−0.519	0.244	1.031	0.051	−0.431	0.685
	(−2.57)		(−2.93)	(−3.08)	(5.96)	(10.61)	(0.83)	(−5.96)	

The performance estimates indicate that lottery-type stocks earn significantly lower average returns, relative to both nonlottery and other stock categories.

3. Empirical result: Return of lottery stocks

	VW Portfolios		EW Portfolios		
Decile	Average return	Four-factor alpha	Average return	Four-factor alpha	Average MAX
Low MAX	1.01	0.05	1.29	0.22	1.30
2	1.00	0.00	1.45	0.33	2.47
3	1.00	0.04	1.55	0.39	3.26
4	1.11	0.16	1.55	0.39	4.06
5	1.02	0.09	1.49	0.31	4.93
6	1.16	0.15	1.49	0.33	5.97
7	1.00	0.03	1.37	0.23	7.27
8	0.86	−0.21	1.32	0.20	9.07
9	0.52	−0.49	1.04	−0.09	12.09
High MAX	−0.02	−1.13	0.64	−0.44	23.60
10-1	−1.03	−1.18	−0.65	−0.66	
difference	(−2.83)	(−4.71)	(−1.83)	(−2.31)	

The difference between high and low portfolio is economically significant and statistically significant at all conventional levels.

cross-sectional regressions provide strong corroborating evidence for an economically and statistically significant negative relation between extreme positive returns and future returns.

3. Empirical result: Characteristics of LP factor

Panel A: Summary statistics

Factor	Mean (%)	Std dev(%)	Sharpe ratio	Skewness	Kurtosis
LP	1.810***	2.078	0.871	-0.957	3.246
	(19.21)				
MGMT	0.588***	2.859	0.206	0.299	4.970
	(4.42)				
PERF	0.698***	4.040	0.173	-0.039	6.669
	(3.71)				
FIN	0.675***	3.895	0.173	-0.098	9.310
	(3.82)				
PEAD	0.571***	1.897	0.301	0.299	7.226
	(6.63)				
MOM	0.613***	4.436	0.138	-1.368	13.936
	(3.05)				
LIQ	0.408***	3.425	0.119	-0.098	3.826
	(2.63)				
FMAX	-0.539**	5.211	-0.103	0.111	10.521
	(-2.28)				

Panel B: Correlations

Factor	LP	MGMT	PERF	FIN	PEAD	MOM	LIQ	FMAX
LP	1.000							
MGMT	0.193	1.000						
PERF	0.379	0.030	1.000					
FIN	0.314	0.793	0.185	1.000				
PEAD	0.251	-0.019	0.397	-0.068	1.000			
MOM	0.297	0.004	0.729	0.039	0.463	1.000		
LIQ	-0.019	-0.015	0.012	0.068	0.047	0.023	1.000	
FMAX	-0.293	-0.696	-0.224	-0.796	0.081	0.005	-0.003	1.000

The average monthly return of the LP factor is 1.81% per month, and has the highest Sharpe ratio of 0.87.

The lottery preference factor has a low or mild correlation with the other factors.

3. Empirical result: Characteristics of LP factor

Factors	LP					
	Mean	FF-5	Q-4	M-4	BF-3	FMAX-6
Constant	1.810***	1.801***	1.734***	1.800***	1.604***	1.786***
	(19.21)	(19.68)	(18.77)	(19.69)	(16.98)	(19.58)
MKT		-0.093***	-0.096***	-0.056**	-0.066***	-0.074***
		(-4.16)	(-4.46)	(-2.46)	(-2.96)	(-3.00)
SMB		-0.067**	-0.039	-0.092***		-0.088**
		(-2.00)	(-1.25)	(-2.89)		(-2.52)
HML		-0.169***				-0.076**
		(-3.95)				(-2.12)
RMW		0.207***				
		(4.76)				
CMA		0.169***				
		(2.65)				
I/A			0.015			
			(0.30)			
ROE			0.243***			

The regression intercepts (alphas) for the LP factor remain economically and statistically significant, in the range of 1.60% to 1.80% per month
All the R2s are small in the range of 16.7% to 20.4%, indicating large unexplained variation of the LP factor.

3. Empirical result: Explanatory power of LP factor

Panel A: Alphas

Anomaly	Unadjusted	MKT+LP	Q-4	Q-4+LP
Gross profitability	0.484***	0.289	0.258*	0.400**
ValProf	0.588***	0.967***	0.374**	0.484**
Accruals	0.214	0.521***	0.395***	0.505***
Net Issuance(A)	0.699***	0.455***	0.497***	0.280*
Investment	0.381***	0.385**	0.167	-0.005
Ohlson's O-score	0.534**	-0.413	0.421***	0.161
Net Issuance(M)	0.534***	0.164	0.333**	0.111
Failure probability	1.130***	-0.322	0.653***	0.121
ValMomProf	1.155***	0.752**	0.610***	0.340
Idiosyncratic volatility	0.823**	0.073	0.410**	0.309
Momentum	1.092***	-0.481	0.182	-0.562
PEAD(CAR3)	0.778***	0.312*	0.752***	0.363*
Return on market equity	0.800***	-0.079	0.124	0.048
Industry momentum	0.531*	-0.431	0.441	-0.440
Industry relative reversals	0.640***	1.015***	0.624***	1.061***
Highfrequency Combo	1.043***	0.331	0.904***	0.268
Seasonality	0.678***	0.018	0.704***	0.318
Ind relative reversals(L)	0.808***	1.017***	0.729***	0.901***
Highfrequency combowHS	1.012***	-0.045	0.956***	0.043

The two-factor model consist of the market factor and the lottery preference factor provides some explanatory power for anomaly returns: 11 of the 19 anomalies returns become economically and statistically insignificant.
The last column of Table 5 shows that lottery preference factor has the largest improvement in the explanatory power.

3. Empirical result: Explanatory power of LP factor

Panel A: 19 Anomalies, value-weighted, NYSE deciles				
Measure	Unadjusted	MKT+LP	Q-4	Q-4+LP
Average $\|\alpha\|$	0.733	0.425	0.502	0.354
Average $\|t\|$	3.77	1.76	2.92	1.54
GRS		4.93	8.88	4.09
p-value		1.15×10^{-10}	0	2.74×10^{-8}
Number of min$\|\alpha\|$	1	4	5	9
Panel B: 32 Anomalies, value-weighted, NYSE deciles				
Measure	Unadjusted	MKT+LP	Q-4	Q-4+LP
Average $\|\alpha\|$	0.590	0.437	0.350	0.313
Average $\|t\|$	3.03	1.72	2.07	1.34
GRS		4.08	6.27	3.56
p-value		7.44×10^{-12}	0	1.14×10^{-9}
Number of min$\|\alpha\|$	3	6	11	12

The last column of Table 6 in Panel A shows that the model has the lowest GRS test statistic as well as the lowest number of anomalies for which the model produces the smallest absolute value of alpha.
Overall, the results confirms the strong incremental power of the lottery preference factor for anomaly returns.

3. Empirical result: LP factor and anomalies

Anomaly	Long leg			Short leg			Long-short		
	High *SKEW*	Low *SKEW*	High-low	High *SKEW*	Low *SKEW*	High-low	High *SKEW*	Low *SKEW*	High-low
MOM	0.975***	0.857***	0.118	-0.779***	0.412	-1.191***	1.753***	0.445**	1.309***
t-stat	(4.05)	(4.09)	(1.12)	(-2.68)	(1.48)	(-11.61)	(9.65)	(2.55)	(10.61)
IVOL	0.877***	0.639***	0.239***	-0.995***	0.240	-1.236***	1.873***	0.399**	1.474***
t-stat	(5.52)	(4.29)	(4.14)	(-3.40)	(0.83)	(-10.11)	(9.63)	(2.01)	(11.64)
P_CHS	1.096***	0.994***	0.103	-0.854**	0.250	-1.104***	1.950***	0.744***	1.207***
t-stat	(5.09)	(4.41)	(1.21)	(-2.32)	(0.74)	(-7.00)	(8.14)	(3.78)	(7.60)
O_SCORE	0.908***	0.819***	0.090	-0.297	0.314	-0.611***	1.206***	0.505***	0.701***
t-stat	(3.49)	(3.05)	(0.94)	(-1.01)	(1.17)	(-4.57)	(6.96)	(3.15)	(4.92)
AG	0.388	0.335	0.054	-0.419	0.297	-0.716***	0.808***	0.037	0.770***
t-stat	(1.32)	(1.19)	(0.47)	(-1.28)	(1.07)	(-4.86)	(6.06)	(0.32)	(5.35)
OP	0.863***	0.655**	0.208	-1.244***	-0.458	-0.786***	2.107***	1.113***	0.994***
t-stat	(3.15)	(2.34)	(1.26)	(-3.66)	(-1.48)	(-3.80)	(9.75)	(5.43)	(4.24)
YB	0.782***	0.554**	0.228	-0.999***	0.012	-1.010***	1.780***	0.542**	1.238***
t-stat	(2.70)	(2.00)	(1.23)	(-2.74)	(0.04)	(-4.45)	(7.27)	(2.48)	(4.49)
ROA	1.158***	0.899***	0.259***	-1.019***	-0.264	-0.755***	2.177***	1.163***	1.013***
t-stat	(4.52)	(3.51)	(2.70)	(-2.77)	(-0.83)	(-5.00)	(10.19)	(6.91)	(6.68)

The economic significance of anomalies depend crucially upon stock lottery preference. The economic significance of anomaly returns is much smaller among stocks with low lottery preference.

The return spreads are mainly driven by the short leg of the anomalies among stocks with high lottery preference.

3. Empirical result: LP factor and anomalies

We now investigate the cross-sectional relation between lottery preference and anomaly returns using FM regressions.

$$R_{i,t+1} = \lambda_{0,t} + \lambda_{1,t} * Dum_{L_{i,t}} + \lambda_{2,t} * Anomaly_{i,t} + \lambda_{3,t} * Dum_{L_{i,t}} * Anomaly_{i,t} + \varepsilon_{i,t+1}$$

	MOM			*IVOL*			*P_CHS*		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
DUM_SKEW	-0.233***	-0.243***	-0.211***	-0.233***	-0.112***	0.366***	-0.239***	-0.177***	-0.144**
	(-4.35)	(-5.26)	(-4.52)	(-4.35)	(-3.14)	(4.51)	(-3.88)	(-3.16)	(-2.42)
ANOMALY		0.009***	0.007***		-0.246***	-0.137***		-0.887***	-0.651***
		(5.00)	(3.21)		(-6.93)	(-2.81)		(-6.44)	(-3.40)
DUM_SKEW × ANOMALY			0.004***			-0.165***			-0.323**
			(4.18)			(-6.04)			(-2.12)
Constant	0.688***	0.621***	0.601***	0.688***	1.331***	1.041***	0.663**	0.791***	0.771***
	(3.02)	(2.90)	(2.80)	(3.02)	(7.15)	(6.01)	(2.51)	(2.93)	(2.89)
R^2	0.002	0.015	0.016	0.002	0.019	0.021	0.001	0.008	0.010

The significance of the interaction terms imply that anomaly returns are more pronounced among stocks with high lottery preference than among stocks with low lottery preference.

3. Empirical result: The potential economic channel

We construct daily short volume ratio proxies. The SVRE is defined as the average ratio across markets using each individual stock short volume ratio.

	Mean	Median	Min
2010-2018			
Lowest skewness portfolio SVR_E	0.446	0.445	0.343
Highest skewness portfolio SVR_E	0.430	0.427	0.343
SVR_E difference	-0.016	-0.016	-0.064
Lowest skewness portfolio SVR	0.425	0.424	0.318
Highest skewness portfolio SVR	0.405	0.404	0.320
SVR difference	-0.019	-0.019	-0.072

The results show that stocks with high lottery features have lower short sale volumes on average and investors are reluctant to short sell stocks with high lottery features, which exacerbates the mispricing of lottery stocks.

4. Conclusion

1. Individual investors prefer to invest in stocks with lottery characteristics.
2. The lottery characteristics of stocks can negatively and significantly predict future returns.
3. Lottery factor has a strong explanatory power for the anomalies.

5. 中国市场上的博彩偏好

彩票类股票交易行为分析:来自中国A股市场的证据
郑振龙 孙清泉,经济研究, 2013（5）

基于1997-2011年的月度数据，以低股价、高历史日收益率和高换手率来识别股票的彩票特性，使用组合分析法和FM回归法，研究了彩票偏好与股票未来回报之间的关系。

研究发现：

1. 我国股票市场存在明显的彩票偏好。
2. 彩票类股票具有较小的公司规模、较高的账面市值比、较高的流动性、具有较高的市场系统性风险。
3. 彩票偏好无明显的行业聚集和个股持续现象。
4. 由于彩票类股票被彩票偏好投资者过度追逐，其年收益率至少低于其他股票5%。

5. 中国市场上的博彩偏好

价值性投资还是博彩性投机？——中国A股市场的MAX异象研究

朱红兵 张兵,金融研究,2020 02

基于1995-2017年的月频数据，使用组合分析法和FM回归法，研究了股票日最大收益率（MAX）与未来回报之间的关系。

研究发现：

1. 中国A股市场存在显著的MAX异象。
2. 短期内MAX具有惯性传递特征。
3. 低价值、高博彩特征股票的MAX异象要显著强于高价值、低博彩特征的股票。
4. 由于套利约束，投资者非理性投机行为导致的证券价格偏离在中短期内无法恢复至均衡水平，强化了MAX异象。

6. 启发

1. Jiang et al. (2020) 构建LP因子的步骤相对于FF5因子和q因子过于复杂，且构建过程中选择无法被q因子所解释的异象作为构建LP因子的基础，再使用LP因子解释这些异象，逻辑上似乎有点不太能自圆其说。
2. 中国市场上已经被证实存在彩票异象，但是还没有人检验过彩票因子对于其他异象的解释能力。