

Alternative lottery measure and cross-sectional returns

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1.Introduction

Background

- As a result of the limited attention of investors, investors in the stock markets are not able to screen thousands of stocks one by one.
- Stocks that perform excellently in some time period tend to attract investors' attention easier.
- Investors are likely to believe that the high volatility and large return tend to repeat in the future again. As a result of the preference, positively skewed stocks are inclined to be overvalued.

1.Introduction

Motivation

- Previous studies shows that MAX is a nice proxy for lottery asserts.
- But MAX is strongly affected by extreme values or outliers.
- ALM is different from MAX, which is the quantile of the excess stock return distribution, thus it cannot be easily influenced by some extreme values and it is robust.
- China becomes the second-largest economy in the world in recent years. Based on previous studies, is there any differences between China and US?

1.Introduction

Questions and Methods

- What's the role of ALM in the cross-sectional pricing of stocks as a proxy variable for the lottery?
 - portfolio sort and FM regressions.
- The differences between China and US.
- Since ALM is due to investor preference, is there any difference when investors have different sentiment?
- Robustness test

1.Introduction

Literature review

- MAX and IE or IS are found to be negatively related to expected stock returns by Bali, Cakici, and Whitelaw (2011) and Jiang, Wu, Zhou, and Zhu (2020).
- Fong (2013) finds that sentiment has a great influence on the return between the lottery and non-lottery stocks.
- Annaert et al. (2013) find in European markets the MAX effect can weaken the anomalous IV effect. Nartea, Kong, and Wu (2017) find that in the Chinese stock market, the MAX effect does not weaken the anomalous IV effect. Bali, Cakici, and Whitelaw (2011) document the MAX effect can reverse the anomalous IV effect in the U.S. market.

1.Introduction

Contributions

- different from the existing literature and contributes to the current literature as we find another lottery proxy that is different from commonly used proxies since the predictive power of the new lottery proxy cannot be captured by the existing lottery proxies during the high sentiment periods by using both the U.S. and Chinese stock markets.
- most results are similar for both the U.S. and Chinese stock markets, but we still find some differences. Retail investors have stronger lottery preference in the U.S., while the lottery preference is similar for retail and institutional investors in China.

2.Data and Method

Variables

- ALM
 - Similar to the methodology to calculate the value at risk
 - in each month by using the excess daily returns of the current one-year
 - the requirement of 200 non-missing return observations.
 - The $q\%$ ALM equals the value of the original $(1-q\%)$ quantile.
 - calculate 1%, 5%, and 10% ALM.
- ALM_E
 - The $q\%$ ALM_E of each stock equals the average of all gains greater than the associated $q\%$ ALM.

2.Data and Method

Data

- the U.S.
 - CRSP 1965.07-2018.12
 - all common stocks on NYSE, AMEX and NASDAQ.
 - restrict the sample to stocks with beginning-of-month prices of five dollars or more.
- China
 - CSMAR 1997.01-2019.12
 - All A-shares on Shanghai and Shenzhen Stock Exchanges.
 - FF5 monthly excess returns from the China Asset Management Research Center of Central University of Finance and Economics.
 - remove ST; six months' trading data after IPO; $BM < 0$; financial; 120 missing during past 12 months; 15 missing during past month.

2.Data and Method

Data

Panel A: The U.S. summary statistics for decile portfolios of stocks sorted by 1% ALM

Decile	1% ALM	1%ALM _E	SIZE	BM	MOM	TURN	ILLIQ	BETA	MAX5	SKEW	IVOL
1(lowest)	3.370	4.135	6.975	-0.361	4.837	1.139	0.294	0.546	1.533	-0.108	1.098
2	4.447	5.460	6.597	-0.478	5.241	1.323	0.306	0.735	2.009	-0.112	1.414
3	5.329	6.565	6.125	-0.491	5.631	1.421	0.354	0.813	2.346	-0.105	1.665
4	6.245	7.706	5.708	-0.504	5.684	1.528	0.421	0.883	2.689	-0.100	1.923
5	7.260	8.986	5.336	-0.538	6.005	1.624	0.508	0.962	3.069	-0.097	2.203
6	8.411	10.448	5.062	-0.574	6.018	1.726	0.577	1.051	3.496	-0.093	2.511
7	9.772	12.173	4.815	-0.630	7.029	1.820	0.675	1.143	3.970	-0.092	2.833
8	11.565	14.524	4.589	-0.700	9.060	1.899	0.815	1.217	4.570	-0.088	3.207
9	14.239	18.264	4.350	-0.838	16.040	1.984	1.012	1.279	5.455	-0.089	3.678
10(highest)	18.815	25.433	3.913	-1.033	31.475	2.040	1.474	1.233	6.870	-0.091	4.156

Panel C: China summary statistics for decile portfolios of stocks sorted by 1% ALM

Decile	1% ALM	5% ALM	1%ALM _E	5%ALM _E	SIZE	BM	TURN	MOM	REV	MAX	ISKEW	IVOL
1(lowest)	4.992	3.538	6.039	4.581	7.486	6.637	0.254	2.800	0.036	3.708	0.269	1.496
2	6.053	3.959	7.199	5.382	7.443	6.591	0.293	3.203	-0.078	4.362	0.335	1.633
3	6.629	4.208	7.823	5.801	7.431	6.533	0.315	6.141	-0.045	4.621	0.348	1.734
4	7.106	4.471	8.267	6.166	7.423	6.479	0.336	8.662	0.057	4.880	0.370	1.837
5	7.545	4.693	8.661	6.496	7.435	6.441	0.359	11.569	0.107	5.101	0.365	1.914
6	8.006	4.902	9.072	6.808	7.431	6.398	0.379	15.928	0.141	5.316	0.379	1.987
7	8.516	5.115	9.439	7.148	7.409	6.365	0.399	18.780	0.255	5.481	0.387	2.070
8	9.071	5.340	9.793	7.528	7.361	6.331	0.436	21.632	0.414	5.758	0.404	2.156
9	9.601	5.692	10.037	8.044	7.290	6.267	0.484	26.202	0.402	5.956	0.420	2.272
10(highest)	10.038	6.228	10.341	8.753	7.246	6.268	0.550	28.978	0.292	6.232	0.437	2.404

2.Data and Method

Method

- the single and double sorting methods
 - high- and low-sentiment periods
 - BW sentiment index in the U.S. stock market and consumer confidence index in the Chinese stock market.
- the Fama-MacBeth regression method.

$$ExR_{i,t+1} = b_{0,t} + b_{1,t}ALM_{i,t} + b_{2,t}X_{i,t} + \varepsilon_{i,t+1},$$

3. Empirical Result

Full sample: single sort.

- sort stocks by 1% ALM into ten deciles to examine their performance.
- the ALM is negatively related to expected returns.

Panel B	Value-weighted			
	(1)	(2)	(3)	(4)
Portfolio	Excess Return (%)	FF5 alpha (%)	Excess Return (%)	FF5 alpha (%)
1% ALM	for the U.S.	for the U.S.	for China	for China
1(lowest)	0.497*** (3.69)	-0.007 (-0.13)	1.056** (2.34)	0.261 (1.31)
2	0.509*** (3.02)	-0.121** (-2.58)	1.038** (2.17)	0.367* (1.94)
3	0.625*** (3.39)	0.020 (0.39)	1.138** (2.22)	0.520*** (2.97)
4	0.536*** (2.63)	-0.132** (-2.09)	0.981* (1.92)	0.369** (2.34)
5	0.453** (2.02)	-0.131* (-1.81)	0.870 (1.62)	0.042 (0.28)
6	0.653*** (2.67)	0.033 (0.40)	0.727 (1.32)	-0.018 (-0.13)
7	0.486* (1.76)	-0.007 (-0.07)	0.640 (1.16)	-0.166 (-0.98)
8	0.563* (1.87)	0.036 (0.33)	0.453 (0.80)	-0.378** (-2.30)
9	0.305 (0.94)	-0.137 (-1.19)	0.364 (0.64)	-0.400** (-2.48)
10(highest)	-0.194 (-0.54)	-0.520*** (-3.72)	0.261 (0.42)	-0.744*** (-3.44)
10-1 spread	-0.691** (-2.25)	-0.513*** (-3.24)	-0.795** (-2.08)	-1.005*** (-3.17)

3. Empirical Result

Full sample: FM regression.

- this negative relationship disappears when adding the MAX or VOL in the U.S. stock market, while still existing in Chinese market.

Panel A : The U.S.							Panel B						
	(1)	(2)	(3)	(4)	(5)	(6)	China	(1)	(2)	(3)	(4)	(5)	(6)
1% ALM	-0.0700*** (-3.09)	-0.0141 (-0.62)	0.0035 (0.17)	-0.1376*** (-10.95)	-0.1197*** (-9.75)	-0.0612*** (-5.05)	1% ALM	-0.1715*** (-5.87)	-0.1414*** (-4.89)	-0.1554*** (-5.26)	-0.1560*** (-5.66)	-0.1465*** (-5.38)	-0.1092*** (-4.14)
SIZE				-0.2782*** (-7.13)	-0.2933*** (-7.52)	-0.2998*** (-7.52)	SIZE				-0.5734*** (-3.77)	-0.5686*** (-3.76)	-0.5830*** (-3.68)
BM				0.1762*** (3.25)	0.1732*** (3.20)	0.1167** (2.15)	BM				0.0615 (0.72)	0.0651 (0.76)	0.0823 (0.95)
MOM				0.0098*** (6.48)	0.0097*** (6.55)	0.0074*** (4.85)	MOM				0.0052 (1.57)	0.0052 (1.57)	0.0050 (1.40)
TURN				-0.0436 (-1.15)	0.0009 (0.02)	0.0423 (1.21)	TURN				-1.2795*** (-7.95)	-1.2672*** (-7.64)	-1.3713*** (-8.26)
ILLIQ				0.0198 (1.08)	0.0410** (2.02)	0.0448** (2.22)	BETA				-0.0391 (-0.49)	-0.0382 (-0.49)	-0.0161 (-0.21)
BETA				0.9824*** (4.75)	1.0292*** (4.84)	1.0810*** (4.97)	IVOL			-0.1660*** (-2.82)	0.0875* (1.68)	0.1741*** (3.46)	0.1297** (2.48)
MAX		-0.0784*** (-11.67)		-0.0793*** (-10.73)	-0.0146 (-1.41)		ISKEW					-0.1342*** (-3.77)	-0.1369*** (-3.91)
MAX5						-0.1602*** (-4.80)	MAX		-0.0637*** (-4.12)			-0.0338** (-2.41)	-0.0335** (-2.41)
SKEW							REV						-0.0522*** (-7.75)
ISKEW						0.0271* (1.65)	Constant	2.5295*** (3.38)	2.5802*** (3.53)	2.7073*** (3.65)	6.4145*** (3.75)	6.3203*** (3.71)	6.0980*** (3.41)
REV						-0.0255*** (-5.48)	R-squared	0.013	0.019	0.023	0.093	0.097	0.112
VOL			-0.2761*** (-11.29)		-0.3037*** (-8.00)								
IVOL						-0.0634 (-1.61)							
1% VaR						-0.1505*** (-10.47)							
Constant	1.1772*** (6.88)	1.2113*** (7.09)	1.3097*** (7.72)	2.7382*** (9.20)	2.9114*** (9.70)	3.1337*** (10.12)							
R-squared	0.027	0.030	0.031	0.086	0.088	0.095							

3. Empirical Result

Full sample: Double sort-MAX.

- In order to confirm that the ALM can be fully explained by MAX in the U.S. stock market and this effect doesn't exist in the Chinese stock market. We conduct the double sorting based on MAX and ALM.
- the effect of 1% ALM can be fully explained by MAX in the U.S. stock market.
- the negative relation between 1% ALM and excess returns cannot be fully explained by MAX in the Chinese stock market.

Panel A the U.S.				Panel B China									
Value-weighted	Excess Return			FFCPS 5-factor Alpha			Value-weighted	Excess Return			FFCPS 5-factor Alpha		
1%ALM	V1	V5	V5-V1	V1	V5	V5-V1	1%ALM	V1	V5	V5-V1	V1	V5	V5-V1
MAX1	0.651*** (5.14)	1.139*** (5.55)	0.488*** (3.50)	0.259*** (3.30)	0.463*** (6.02)	0.204** (2.15)	MAX 1	1.331*** (2.66)	0.431 (0.79)	-0.900*** (-2.63)	0.400 (1.40)	-0.438** (-2.23)	-0.838** (-2.49)
MAX2	0.687*** (4.61)	1.083*** (4.36)	0.396** (2.57)	0.204*** (3.28)	0.339*** (4.10)	0.135 (1.41)	MAX 2	1.072** (2.17)	0.863 (1.51)	-0.208 (-0.64)	0.320 (1.41)	-0.112 (-0.58)	-0.432 (-1.40)
MAX3	0.703*** (4.16)	0.962*** (3.35)	0.259 (1.43)	0.137** (2.22)	0.206** (2.32)	0.069 (0.61)	MAX 3	1.193** (2.36)	1.100 (1.64)	-0.093 (-0.23)	0.308 (1.28)	0.209 (0.81)	-0.100 (-0.27)
MAX4	0.630*** (3.32)	0.503 (1.59)	-0.127 (-0.67)	0.031 (0.49)	-0.340*** (-3.53)	-0.371*** (-2.86)	MAX 4	1.134** (2.25)	0.530 (0.88)	-0.604* (-1.67)	0.388 (1.64)	-0.421* (-1.84)	-0.809** (-2.35)
MAX5	0.379* (1.74)	-0.671** (-2.05)	-1.075*** (-6.16)	-0.255*** (-3.82)	-1.500*** (-11.41)	-1.241*** (-8.02)	MAX 5	0.998* (1.69)	-0.310 (-0.48)	-1.308*** (-3.48)	0.301 (1.22)	-1.288*** (-4.23)	-1.589*** (-4.23)
Avg(M1-M5)	0.610*** (3.75)	0.604** (2.25)	-0.006 (-0.04)	0.075 (1.49)	-0.159** (-2.33)	-0.234*** (-2.66)	Avg(M1-M5)	1.145** (2.37)	0.523 (0.90)	-0.623** (-2.30)	0.344** (2.40)	-0.410*** (-2.97)	-0.754*** (-3.26)

3. Empirical Result

Full sample: Double sort-IOR.

- the Chinese stock market is dominated by retail investors, which is different from the U.S. market.
- Retail investors tend to have higher turnover ratio than industrial investors.
- double sorts of the institutional ownership ratio (IOR) and ALM at 1%.
- The 1% ALM effect on the expected returns is a significantly stronger in the lowest IOR quintile compared with the ALM effect in the highest IOR quintile in the U.S. stock market, while there is no significant difference in the ALM spread between the highest and lowest IOR quintiles in China.

Panel A the U.S.							Panel B China						
Value-weighted	Excess Return			FFCPS 5-factor Alpha			Value-weighted	Excess Return			FFCPS 5-factor Alpha		
1%ALM	V1	V5	V5-V1	V1	V5	V5-V1	1%ALM	V1	V5	V5-V1	V1	V5	V5-V1
IOR 1	0.549*** (3.38)	-0.647 (-1.59)	-1.185*** (-3.34)	0.050 (0.44)	-1.493*** (-6.59)	-1.529*** (-5.89)	IOR 1	1.443** (2.35)	0.364 (0.52)	-1.079*** (-3.20)	0.515** (2.06)	-0.647** (-1.99)	-1.162*** (-3.22)
IOR 2	0.657*** (3.90)	0.134 (0.31)	-0.523 (-1.31)	0.075 (0.69)	-0.713*** (-2.99)	-0.788*** (-2.85)	IOR 2	0.888* (1.67)	0.368 (0.54)	-0.520 (-1.17)	0.253 (0.90)	-0.299 (-1.04)	-0.552 (-1.28)
IOR 3	0.720*** (4.38)	0.059 (0.15)	-0.661* (-1.84)	0.223** (2.53)	-0.659*** (-3.48)	-0.882*** (-4.00)	IOR 3	1.585*** (2.92)	0.352 (0.54)	-1.233*** (-3.05)	0.884*** (2.94)	-0.406 (-1.41)	-1.290*** (-3.16)
IOR 4	0.698*** (3.84)	0.395 (1.02)	-0.303 (-0.97)	0.110 (1.38)	-0.352** (-2.10)	-0.462** (-2.24)	IOR 4	1.185** (2.36)	0.219 (0.35)	-0.966** (-2.47)	0.476* (1.79)	-0.471* (-1.75)	-0.947** (-2.53)
IOR 5	0.717*** (3.74)	0.471 (1.23)	-0.245 (-0.83)	0.088 (0.96)	-0.328** (-2.08)	-0.416** (-2.06)	IOR 5	0.832* (1.85)	0.329 (0.54)	-0.503 (-1.24)	0.248 (1.04)	-0.057 (-0.20)	-0.305 (-0.82)
DIFF			1.017*** (3.92)			1.128*** (4.22)	DIFF			0.575 (1.27)			0.857* (1.83)

3. Empirical Result

Subsample: investor sentiment.

- the relationship between the ALM and the stock returns are different under high and low investor sentiment periods.
- divide all the data by months into high- and low- sentiment periods.
- High-sentiment periods are defined as months in which the investor sentiment index is larger than its mean.
- Low-sentiment periods are defined as the time when the investor sentiment index is smaller than its mean.
- in the U.S. stock market we apply the BW sentiment (Baker and Wurgler, 2006), and use the customer confidence index in the Chinese stock markets.

3. Empirical Result

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3. Empirical Result

Subsample: investor sentiment.

- under the different levels of investor sentiment, the relationship between the ALM and the excess return is diverse.

Panel A: 1% ALM					Panel B: 1% ALM				
High-sentiment period (investor sentiment index higher than its mean)					Low-sentiment period (investor sentiment index less than its mean)				
Portfolio	(1) Excess Return (%) for the U.S.	(2) FF5 alpha (%) for the U.S.	(3) Excess Return (%) for China	(4) FF5 alpha (%) for China	Portfolio	(1) Excess Return (%) for the U.S.	(2) FF5 alpha (%) for the U.S.	(3) Excess Return (%) for China	(4) FF5 alpha (%) for China
1(lowest)	0.597** (2.91)	-0.000 (-0.00)	1.573** (2.41)	0.388 (1.38)	1(lowest)	0.411** (2.30)	-0.036 (-0.49)	0.535 (0.86)	0.165 (0.59)
2	0.529** (2.15)	-0.148** (-2.15)	1.514** (2.24)	0.651** (2.12)	2	0.492** (2.12)	-0.111* (-1.75)	0.559 (0.82)	0.108 (0.49)
3	0.558** (2.07)	-0.065 (-0.81)	1.558** (2.17)	0.782*** (2.77)	3	0.683*** (2.69)	0.059 (0.91)	0.714 (0.98)	0.135 (0.66)
4	0.446 (1.51)	-0.117 (-1.17)	1.223* (1.71)	0.400 (1.65)	4	0.615** (2.19)	-0.157* (-1.93)	0.738 (1.01)	0.221 (1.10)
5	0.144 (0.43)	-0.232** (-2.09)	1.114 (1.57)	0.135 (0.58)	5	0.722** (2.39)	-0.064 (-0.67)	0.625 (0.77)	-0.068 (-0.38)
6	0.189 (0.53)	-0.126 (-1.04)	0.976 (1.28)	0.074 (0.34)	6	1.056*** (3.14)	0.164 (1.47)	0.477 (0.60)	-0.258 (-1.36)
7	-0.054 (-0.13)	-0.032 (-0.22)	0.729 (0.96)	-0.211 (-0.88)	7	0.955*** (2.64)	0.016 (0.14)	0.550 (0.69)	-0.083 (-0.34)
8	-0.258 (-0.57)	-0.189 (-1.16)	0.282 (0.36)	-0.506** (-2.33)	8	1.276*** (3.18)	0.237* (1.66)	0.625 (0.75)	-0.239 (-0.99)
9	-0.520 (-1.05)	-0.215 (-1.20)	0.277 (0.35)	-0.577** (-2.40)	9	1.021** (2.43)	-0.040 (-0.27)	0.451 (0.55)	-0.290 (-1.34)
10(highest)	-1.322** (-2.45)	-0.798*** (-3.84)	0.634 (0.67)	-0.496* (-1.89)	10(highest)	0.786* (1.68)	-0.260 (-1.40)	-0.116 (-0.14)	-0.979*** (-2.96)
10-1 spread	-1.919*** (-3.96)	-0.798*** (-3.52)	-0.939* (-1.83)	-0.885** (-2.41)	10-1 spread	0.375 (0.98)	-0.224 (-1.04)	-0.650 (-1.14)	-1.144** (-2.14)

3. Empirical Result

Subsample: investor sentiment.

- The ALM effect is much stronger during the high-sentiment period.

Panel A: The U.S.		High-sentiment periods (the BW sentiment index is larger than its mean)					
		(1)	(2)	(3)	(4)	(5)	(6)
1% ALM		-0.1502*** (-5.26)	-0.0873*** (-3.10)	-0.0607** (-2.43)	-0.1694*** (-10.18)	-0.1438*** (-9.19)	-0.1476*** (-9.44)
Panel B: China		High-sentiment periods (the Consumer confidence index is larger than its mean)					
		(1)	(2)	(3)	(4)	(5)	(6)
1% ALM		-0.1827*** (-3.17)	-0.1550*** (-2.95)	-0.1498*** (-2.88)	-0.1498*** (-3.42)	-0.1417*** (-3.33)	-0.1081*** (-2.61)
Panel C: The U.S.		Low-sentiment periods (the BW sentiment index is less than its mean)					
		(1)	(2)	(3)	(4)	(5)	(6)
1% ALM		-0.0003 (-0.01)	0.0495* (1.86)	0.0593** (2.56)	-0.1100*** (-7.43)	-0.0915*** (-6.29)	-0.0948*** (-6.52)
Panel D: China		Low-sentiment periods (the Consumer confidence index is less than its mean)					
		(1)	(2)	(3)	(4)	(5)	(6)
1% ALM		-0.1366** (-2.07)	-0.1092* (-1.78)	-0.1433** (-2.49)	-0.1420*** (-2.80)	-0.1323*** (-2.63)	-0.0935* (-1.91)

3. Empirical Result

Subsample: investor sentiment-robustness test.

- To confirm our results, we use the double-sorting method to check whether the ALM effect on expected returns can be explained by maximum daily return, momentum, short-term reversal, total volatility, skewness, and idiosyncratic volatility during the high- and low sentiment periods.
- whether the ALM effect varies for different institutional ownership ratio (IOR) level for high or low sentiment periods.
- the significant negative relationship between the ALM and excess stock returns cannot be explained by the maximum when the investor sentiment is high.
- The sentiment conditional result confirms that the negative ALM–return relation is stronger during high-sentiment periods among the same institutional ownership stocks.
- the lottery preferences in China for retail and institutional investors are similar.

3. Empirical Result

Subsample: investor sentiment-roubostness test.

Panel A: The U.S. High sentiment period (the BW sentiment index is higher than its mean)							Panel B: China High sentiment period (the consumer confidence index is higher than its mean)						
Excess Return			FFCPS 5-factor Alpha				Excess Return			FFCPS 5-factor Alpha			
V1	V5	V5-V1	V1	V5	V5-V1		V1	V5	V5-V1	V1	V5	V5-V1	
IOR1	0.514** (2.29)	-1.407** (-2.55)	-1.901*** (-3.90)	-0.024 (-0.16)	-1.595*** (-5.28)	-1.550*** (-4.37)	IOR1	1.406 (1.55)	0.293 (0.28)	-1.113** (-2.47)	0.578* (1.70)	-0.793 (-1.61)	-1.371*** (-2.90)
IOR2	0.711*** (3.14)	-0.730 (-1.29)	-1.441*** (-2.72)	0.046 (0.32)	-0.798*** (-2.69)	-0.845** (-2.47)	IOR2	1.171 (1.48)	0.280 (0.29)	-0.890 (-1.46)	0.483 (1.14)	-0.366 (-0.93)	-0.849 (-1.37)
IOR3	0.715*** (3.23)	-0.830 (-1.45)	-1.545*** (-2.97)	0.234* (1.86)	-0.820*** (-2.90)	-1.053*** (-3.30)	IOR3	1.873** (2.30)	0.273 (0.29)	-1.600** (-2.54)	1.252** (2.48)	-0.260 (-0.55)	-1.513** (-2.26)
IOR4	0.652*** (2.62)	-0.458 (-0.87)	-1.110** (-2.47)	0.081 (0.74)	-0.502** (-2.20)	-0.582** (-2.10)	IOR4	1.699** (2.24)	0.012 (0.01)	-1.687*** (-3.18)	0.768* (1.91)	-0.750* (-1.87)	-1.518*** (-2.85)
IOR5	0.659** (2.55)	-0.229 (-0.45)	-0.888** (-2.14)	0.057 (0.46)	-0.425* (-1.89)	-0.482* (-1.73)	IOR5	1.177* (1.69)	0.266 (0.31)	-0.911 (-1.54)	0.252 (0.62)	-0.303 (-0.68)	-0.556 (-0.99)
DIFF			1.146*** (3.42)			1.084*** (3.01)	DIFF			0.202 (0.28)			0.815 (1.10)
Panel C: The U.S. Low sentiment period (the BW sentiment index is less than its mean)							Panel D: China Low sentiment period (the consumer confidence index is less than its mean)						
Excess Return			FFCPS 5-factor Alpha				Excess Return			FFCPS 5-factor Alpha			
V1	V5	V5-V1	V1	V5	V5-V1		V1	V5	V5-V1	V1	V5	V5-V1	
IOR1	0.594** (2.55)	0.321 (0.53)	-0.273 (-0.54)	0.138 (0.79)	-1.103*** (-3.21)	-1.240*** (-3.26)	IOR1	1.474* (1.79)	0.411 (0.44)	-1.063** (-2.13)	0.380 (1.01)	-0.553 (-1.40)	-0.933* (-1.68)
IOR2	0.588** (2.32)	1.260* (1.87)	0.672 (1.13)	0.059 (0.35)	-0.463 (-1.20)	-0.522 (-1.15)	IOR2	0.585 (0.83)	0.426 (0.46)	-0.159 (-0.25)	0.096 (0.25)	-0.096 (-0.23)	-0.192 (-0.31)
IOR3	0.727*** (2.96)	1.200** (2.13)	0.473 (1.03)	0.171 (1.33)	-0.310 (-1.25)	-0.481 (-1.57)	IOR3	1.275* (1.79)	0.417 (0.46)	-0.858* (-1.73)	0.511 (1.59)	-0.594* (-1.77)	-1.105** (-2.32)
IOR4	0.757*** (2.86)	1.489*** (2.66)	0.732* (1.79)	0.050 (0.44)	-0.046 (-0.18)	-0.096 (-0.32)	IOR4	0.643 (0.99)	0.423 (0.47)	-0.219 (-0.39)	0.167 (0.48)	-0.302 (-0.84)	-0.469 (-0.88)
IOR5	0.791*** (2.77)	1.370** (2.42)	0.579 (1.44)	0.040 (0.30)	-0.194 (-0.86)	-0.234 (-0.79)	IOR5	0.473 (0.83)	0.370 (0.43)	-0.102 (-0.19)	0.253 (1.05)	0.158 (0.40)	-0.095 (-0.19)
DIFF			0.853** (2.09)			1.006** (2.44)	DIFF			0.961* (1.80)			0.838 (1.49)

4. Conclusion

- propose a new lottery proxy called Alternative-lottery-measures (ALM) as a complement to maximum daily return (MAX) and skewness (SKEW).
- the relationship between ALM and expected excess returns is negative in the U.S. but can be fully explained by MAX.
- the relationship between ALM and expected excess returns is negative in China and cannot be fully explained by MAX.
- the lottery preferences in China for retail and institutional investors are similar, while the U.S. are not.
- For a high sentiment period, ALM is negatively related to the expected return and cannot be explained by controls.