# "Betting on the Likelihood of a Short Squeeze"

Ilias Filippou Washington University in St. Louis Pedro A. Garcia-Ares

Instituto Tecnologico Autonomo de Mexico (ITAM) Fernando Zapatero BOSTON UNIVERSITY

November 12, 2021

ILIAS FILIPPOU, PEDRO A. GARCIA-ARES, FERNANDO ZAPATERO BETTING ON THE LIKELIHOOD OF A SHORT SQUEEZE 1 /26

INTRODUCTION			
00000			

### MOTIVATION: SKEWNESS-SEEKING

- Claim: Skewness is a first order factor in investing.
  - Especially, right skewness.
  - Like in a lottery ticket.
  - Small probability of large gains
- Foundations:
  - Friedman and Savage (JPE 1948).
  - Relative wealth concerns, status considerations:
    - Retail investors: Barbell strategies.
    - Mutual Funds: Gambling for resurrection.
  - But NOT through CRRA preferences.

Introduction			
00000			

### MENU OF SKEWED FINANCIAL ASSETS

### Obvious examples:

- Growth stocks.
- VC/Private equity.
- Penny stocks.
- Distressed stocks: Hertz's bankruptcy announcement

### General problem:

- Skewness in stocks is difficult to assess *ex ante*.
- (Not so much in options).
- Solution (for stocks):
  - Use proxies.
  - Growing literature.

INTRODUCTION			
00000			

### ENTER THE SHORT SQUEEZE

### According to the SEC:

"The term 'short squeeze' refers to the pressure on short sellers to cover their positions as a result of sharp price increases or difficulty in borrowing the security the sellers short. The rush by short sellers to cover produces additional upward pressure on the price of the stock, which then can cause an even greater squeeze."

(Key Points About Regulation SHO, SEC.com)

Introduction 000000			

### This Paper

- We identify a possible proxy for right-skewness of stocks:
  - Likelihood of a short-squeeze.
  - Data Explorers Increasing Price Squeeze indicator (DIPS).
    - Measure of the probability of a short squeeze.
    - We compare it with other measures.
    - That is proprietary and objective.
- Short squeezes trigger a positive jump in the stock price.
- Uncertainty about short squeeze likelihood increases skewness.
- Investors pay a premium for calls written on the stock.
  - More bang for the buck that with underlying.

 INTRODUCTION
 LITERATURE
 DATASET
 Empirical Results
 Conclusions
 Appendix

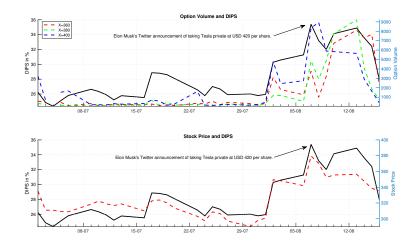
 0000 ● 0
 0000
 00
 00000000
 0
 00

## A FAMOUS SHORT SQUEEZE: TESLA

- 8/7/18: Tesla is the most-shorted stock in the U.S.
- Elon Musk's twitter states:
  - Considering to take it private, funding secured.
- Effects:
  - Sent the share price up as much as 13.3%.
  - 500,000 options traded, twice daily average.
- Short sellers lost about \$1.3 billion (Ihor Dusaniwsky, S3).

INTRODUCTION			

### TESLA'S SHORT SQUEEZE



Ilias Filippou, Pedro A. Garcia-Ares, Fernando Zapatero Betting on the Likelihood of a Short Squeeze 7/26

Literature 0000		

### LOTTERY STOCKS

- Kumar (2009):
  - Idiosyncratic volatility.
  - Idiosyncratic skewness.
  - Low price.
- Bali, Cakici and Whitelaw (2011):
  - Sort stocks according to maximum 10-day return.
  - Also 5-day.
  - Verify they are overpriced.
  - As in a lottery.

Literature 0000		

### LOTTERY OPTIONS

### Boyer and Vorkink (2014):

- They develop their own measure.
- Based on lognormality of the underlying stock return.
- And the truncated nature of the option payoff.
- They verify as negative expected return.
- As with lottery stocks.
- Byun and Kim (2016):
  - Study options on lottery stocks.
  - At-the-money options.
  - Lower expected return the higher the lotteryness of stock.

INTRODUCTION LITERATURE DATASET EMPIRICAL RESULTS CONCLUSIONS APPENDIX 000000 0000 00 000000000 0 00

### LOTTERY STOCKS AND OPTIONS

Filippou, Garcia-Ares and Zapatero (2020):

- Lottery Options replace lottery stocks.
- OTM options are strongly preferred.
- ATM covered call strategies.

Literature 0000		

### SHORT SQUEEZES

- Danielsen and Sorescu (2001), Chen and Singal (2003):
  - Short squeezes contribute to the cost of short sale.
- D'Avolio (2002):
  - Cost of "recall squeezes."
  - Short sellers can buy back at falling prices.
  - 10% of the stocks are never shorted small with poor liquidity.
- Lamont and Stein (2004):
  - Fear of a short squeeze.
  - Short interest is low during the apparent market overvaluation.
- Liu and Xu (2016), Xu and Zheng (2017):
  - Cost of short squeezes is economically meaningful.
  - Short squeezes are higher for stocks with greater liquidity.
  - The role of capital and short sale constraints.

	Dataset •0		

### SHORT SQUEEZE DATA

- Data Explorers Increasing Price Squeeze indicator (DIPS):
   From Markit.
- It compares securities lending data to cash market data:
  - In order to estimate probability of a short squeeze.
  - It typically occurs when DIPS exceeds 20%.
- We compute its monthly standard deviation:
  - As a proxy for right-skewness.
  - Additional layer of uncertainty.
- Data period: July 2006 to September 2019.

	Dataset 0●		

### PORTFOLIO CONSTRUCTION

- At the expiration day each month:
  - Form 10 equally-weighted option portfolios.
  - Based on their prior month DIPS standard deviation.
- Evaluate return over one-month holding period.
- Compute return of long-short strategy:
  - Invests \$1 in the top, and shorts \$1 of the bottom portfolios.
  - According to std(DIPS).

	Empirical Results	
	●00000000	

# PERCENTAGE OF FIRMS WITH EXTREME RETURNS IN STD(DIPS) PORTFOLIOS

	P	anel A: %	firms with	n dailyret;	>15% of I	Portfolios	of ATM o	options so	rted based	l on std([	DIPS)	
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	t-stat
Mean	0.005	0.010	0.012	0.018	0.022	0.031	0.039	0.056	0.073	0.107	0.102	(7.31)
	P	anel B: %	firms witl	n dailyret;	>20% of I	Portfolios	of ATM o	options so	rted based	d on std([	DIPS)	
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	t-stat
Mean	0.002	0.003	0.004	0.006	0.007	0.013	0.015	0.021	0.030	0.050	0.048	(6.61)
Par	nel C: %fi	rms with	up (down	) dev of p	rice (SI) o	of 2 std of	Portfolio	s of ATM	options s	orted bas	ed on std(D	IPS)
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	t-stat
Mean	0.035	0.037	0.038	0.039	0.039	0.043	0.045	0.052	0.051	0.067	0.032	(9.21)

ILIAS FILIPPOU, PEDRO A. GARCIA-ARES, FERNANDO ZAPATERO

Betting on the Likelihood of a Short Squeeze 14 /26

	Empirical Results 000000000	

# STD(DIPS): DELTA-HEDGED CALL OPTION RETURNS

	Panel A: Portfolios of ATM options sorted based on std(DIPS)											
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	<i>t</i> -stat
EW OIW	-0.010 -0.008	-0.012 -0.009	-0.014 -0.011	-0.017 -0.009	-0.020 -0.017	-0.021 -0.020	-0.026 -0.025	-0.029 -0.027	-0.035 -0.036	-0.043 -0.041	-0.033 -0.033	(-12.59) (-8.61)
			Panel B: Risk	-adjusted Returr	is of ATM	options so	rted based	on std(DI	PS)			
	CAPM	Three-Factor	Four-Factor	Five-Factor								
EW	-0.033 (-10.25)	-0.033 (-9.75)	-0.033 (-9.78)	-0.034 (-11.06)								
OIW	-0.032 (-6.92)	-0.031 (-6.64)	-0.031 (-6.79)	-0.031 (-6.71)								

ILIAS FILIPPOU,	Pedro A.	GARCIA-ARES,	Fernando	Zapatero
Betting on th	e Likelihc	od of a Short	SQUEEZE	15/26

	Empirical Results 000000000	

### **OPTIONS SORTED ON LOTTERY FEATURES**

- We run Fama-MacBeth (1973) cross-sectional regressions:
  - Option returns on the previous period std(DIPS), MAX and BV-SKEW.

 $\mathrm{RX}_{i,t+1} = \gamma_{0,t} + \gamma_{1,i} \mathrm{std}(\mathrm{DIPS})_{i,t} + \gamma_{2,i} \mathrm{MAX}(10)_{i,t} + \gamma_{3,i} \mathrm{BV} - \mathrm{SKEW}_{i,t} + \gamma'_{4,i} \mathbf{Z}_{i,t} + \varepsilon_{i,t+1},$ 

- **R** $X_{i,t+1}$ : delta-hedged call option returns of asset *i* at time t + 1.
- **Z**<sub>t</sub>: set of control variables of asset *i* at time *t* + 1.

#### Control Variables:

- log size (Ln(Size)),
- log stock price (Ln(Price)),
- institutional ownership (IOR),
- book-to-market (B/M),
- debt-to-assets (D/A),
- turnover,
- idiosyncratic volatility (IVOL),
- illiquidity (ILLIQ),
- reversals (REV),
- momentum (MOM).

## **CROSS-SECTIONAL REGRESSIONS**

=

=

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	At-the	At-the-money Call Options										
$\begin{tabular}{ c c c c c c } \hline $P$ & $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $												
$\begin{array}{cccccccc} std(D1PS) & -0.83 & -0.42 & -0.100 \\ (-13.19) & (-5.69) & (-3.87) \\ MAX(10) & -0.659 & -0.349 \\ (-13.24) & (-4.84) & (-4.84) \\ BV - SKEW & -0.003 & -0.002 \\ (-4.52) & (-3.61) \\ Ln(Size) & (-4.52) & (-3.61) \\ Ln(StockPrice) & 0.004 \\ (6.61) \\ Ln(StockPrice) & 0.004 \\ (6.61) \\ Ln(StockPrice) & 0.004 \\ (-4.52) & (-5.61) \\ IOR & -0.002 \\ (-1.00) \\ B/M & (-0.004) \\ IOR & (-0.004) \\ (-1.00) \\ B/M & (-0.004) \\ (-1.00) \\ B/M & (-0.004) \\ (-1.00) \\ B/M & (-0.004) \\ (-1.00) \\ D/A & (-0.004) \\ (-1.00) \\ D/A & (-0.004) \\ (-1.00) \\ D/A & (-0.004) \\ (-1.00) \\ IUPL & (-0.218) \\ (-1.00) \\ ILLIQ^{Stacks} & -0.330 \\ (-1.00) \\ ILLIQ^{Stacks} & -0.330 \\ (-2.37) \\ ILLIQ^{Stacks} & (-0.330) \\ REV & (-0.005) \\ REV & (-0.005) \\ (-1.00) \\ OO05 & 0.003 & -0.059 \\ (-3.06) & (1.49) & (-8.79) \\ \end{array}$		(1)	(2)	(3)								
$\begin{array}{cccccccc} (-13.19) & (-6.69) & (-3.37) \\ MAX(10) & (-13.42) & (-4.84) \\ BV - SKEW & -0.003 & -0.002 \\ (-13.42) & (-4.84) \\ BV - SKEW & -0.003 & -0.002 \\ Ln(Sizek) & (-4.52) & (-3.61) \\ Ln(StockPrice) & (-6.89) \\ IOR & $		Delta-k	edged Call O	ptions								
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	std(DIPS)		-0.422	-0.190								
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		(-13.19)	(-6.69)	(-3.87)								
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	MAX(10)											
$\begin{array}{c c} (-4.52) & (-3.61) \\ (-6.52) & (-5.61) \\ (-6.52) & (-6.52)$												
Ln(Size)         0.003 (6.61)           Ln(StockPrice)         0.004 (6.89)           IOR         -0.002 (-1.00)           JOA         0.004 (-1.00)           B/M         0.004 (-1.00)           B/M         0.004 (-1.00)           J/A         0.006 (-3.05)           Turnover         0.001 (-3.75)           IVCL         -0.218 (-3.75)           ILLIQSitecks         -0.330           REV         -0.005           MOM         -0.002           MOM         -0.002           (-1.27)         Constant           -0.005         0.03           (-3.06)         (1.49)	BV - SKEW											
$\begin{array}{c c} (6 \ 61) \\ (6 \ 89) \\ 10R & (-100) \\ 0.004 & (-100) \\ 0.004 & (-100) \\ 0.004 & (-100) \\ 0.004 & (-100) \\ 0.004 & (-100) \\ 0.004 & (-100) \\ 0.004 & (-100) \\ 0.004 & (-100) \\ 0.004 & (-100) \\ 0.004 & (-100) \\ 0.004 & (-100) \\ 0.004 & (-100) \\ 0.005 & (-1$			(-4.52)									
Ln(StockPrice)         0.004           IOR         -0.002           IOR         -0.002           B/M         0.004           D/A         0.004           J/A         0.005           J/A         0.006           J/A         0.001           Turnover         0.001           IVOL         -0.218           ILUQ <sup>Stucks</sup> -0.330           REV         -0.005           MOM         -0.002           MOM         -0.002           _(-1.27)         Constant          0.006         0.003         -0.059           _(-3.06)         (1.49)         (-8.79)	Ln(Size)											
$\begin{array}{cccc} (6.89) \\ IOR & (-1.00) \\ B/M & (-1.00) \\ D/A & (3.63) \\ D/A & (3.49) \\ Turnover & (4.25) \\ IVOL & (-2.18) \\ ILLIQ^{Stocks} & (-3.375) \\ ILLIQ^{Stocks} & (-3.45) \\ REV & (-1.27) \\ MOM & (-1.27) \\ MOM & (-1.27) \\ Constant & -0.006 & 0.003 & -0.659 \\ (-3.66) & (1.49) & (-8.79) \\ \end{array}$												
IOR         -0.002           B/M         0.004           B/M         0.004           J/A         0.006           J/A         0.001           Turnover         0.001           IVOL         -0.218           IVOL         -0.218           REV         -0.330           REV         -0.005           MOM         -0.002           Constant         -0.005           (-3.06)         (1.49)           (-3.06)         (1.49)	Ln(StockPrice)											
$\begin{array}{c} (-1.00) \\ B/M & (0.04) \\ 0.004 \\ 0.004 \\ 0.006 \\ 0.007 $												
B/M 0004 D/A 0.006 Turnover 0.001 Turnover 0.001 IVOL -0.218 (-3.75) ILLIQ <sup>Stacks</sup> -0.330 ILLIQ <sup>Stacks</sup> -0.330 REV -0.005 (-3.45) REV -0.005 (-1.27) MOM -0.002 (-1.27) Constant -0.005 0.003 -0.059 (-3.06) (1.49) (-8.79)	IOR											
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$												
D/A         0.006           Turnover         0.001           Turnover         0.001           IVOL         -0.218           IVOL         -0.218           ILLIQStacks         -0.300           REV         -0.005           MOM         -0.002           MOM         -0.002           (-1.27)         Constant           -0.005         (1.49)           (-3.66)         (1.49)	B/M											
$\begin{array}{cccc} & (3.49) \\ Turnover & (0.01) \\ IVOL & (4.25) \\ IUIQ^{Stacks} & (-3.75) \\ ILLIQ^{Stacks} & (-3.45) \\ REV & (-1.27) \\ MOM & (-1.27) \\ MOM & (-1.27) \\ Constant & -0.006 & 0.003 & -0.059 \\ (-3.06) & (1.49) & (-8.79) \\ \end{array}$	D//											
Turnover         0.001           Turnover         (4.25)           IVOL         -0.218           (-3.75)         (-3.75)           ILLIQStacks         -0.330           REV         -0.005           MOM         -0.002           (-1.27)         Constant           -0.005         (-1.07)           (-3.66)         (1.49)           (-8.79)         (-8.79)	D/A											
IVOL         (4.25)           IVOL         -0.218           ILLIQ <sup>Stocks</sup> (-3.75)           ILLIQ         (-3.45)           REV         -0.005           (-1.27)         (-1.07)           MOM         -0.002           (-1.07)         (-1.07)           Constant         -0.006         0.003         -0.059           (-3.06)         (1.49)         (-8.79)	_											
IVOL         -0.218 (-3.75)           ILLIQ <sup>Stacks</sup> -0.330           REV         -0.005           MOM         -0.002           MOM         -0.002           (-1.27)         Constant           -0.005         (-1.07)           (-3.66)         (1.49)           (-8.79)         (-8.79)	Turnover											
(-3.75)           ILLIQ <sup>Stocks</sup> -0.300           REV         -0.005           (-1.27)         .0005           MOM         -0.002           (-1.005)         .0.059           (-3.46)         (-1.07)           Constant         -0.006         0.003           (-3.06)         (1.49)         (-8.79)	THOT											
ILLIQ <sup>Stocks</sup> -0.390           REV         -0.005           REV         -0.002           MOM         -0.002           (-1.27)         Constant           -0.005         0.033           (-3.46)         (-4.07)	IVOL											
REV         -0.005           MOM         -0.002           MOM         -0.002           (1.27)         -0.002           Constant         -0.006         0.003         -0.059           (-3.06)         (1.49)         (-8.79)	TTTTOStocks											
$\begin{array}{cccc} REV & & -0.005 \\ & (-1.27) \\ MOM & & -0.002 \\ & (-1.07) \\ Constant & -0.006 & 0.003 & -0.059 \\ \hline & (-3.06) & (1.49) & (-8.79) \\ \hline \end{array}$	ILLIQ											
$\begin{array}{c} (-1.27)\\ MOM & -0.002\\ (-1.07)\\ {\rm Constant} & -0.006 & 0.003 & -0.059\\ \hline (-3.06) & (1.49) & (-8.79) \end{array}$	DEU											
MOM -0.002 (-1.07) Constant -0.006 0.003 -0.059 (-3.06) (1.49) (-8.79)	REV											
(-1.07) Constant -0.006 0.003 -0.059 (-3.06) (1.49) (-8.79)	MOM											
Constant -0.006 0.003 -0.059 (-3.06) (1.49) (-8.79)	MOM											
(-3.06) (1.49) (-8.79)	C	0.006	0.002									
<u> </u>	Constant											
		(-5.00)	(1.49)	(-0.19)								
R-squared 0.029 0.053 0.114	R-squared	0.029	0.053	0.114								

#### ILIAS FILIPPOU, PEDRO A. GARCIA-ARES, FERNANDO ZAPATERO

Betting on the Likelihood of a Short Squeeze 17/26

	Empirical Results 000000000	

### STD(DIPS) AND OTHER PREDICTORS OF SHORT SQUEEZES

	Panel A: Short Float and Days to Cover of Portfolios of ATM options sorted based on std(DIPS)											
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	t-stat
					Sł	ort Float o	f DIPS Port	folios				
Mean	0.016	0.024	0.034	0.045	0.057	0.070	0.083	0.101	0.124	0.175	0.159	(18.93
	Days to Cover of DIPS Portfolios											
Mean	1.824	2.079	2.471	2.865	3.192	3.625	3.836	4.141	4.341	4.805	2.981	(12.41
			Panel B: O	ption Retu	rns of port	folios base	d on Short	Float and	Days to C	over		
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	<i>t</i> -sta
						Short Flo	at Portfolio	s				
Mean	-0.013	-0.014	-0.018	-0.020	-0.023	-0.025	-0.026	-0.028	-0.031	-0.027	-0.014	(-6.21
						Days to Co	over Portfoli	ios				

ILIAS FILIPPOU, PEDRO A. GARCIA-ARES, FERNANDO ZAPATERO BETTING ON THE LIKELIHOOD OF A SHORT SQUEEZE 18 /26

### STD(DIPS) AND OPTION ORDER IMBALANCES

	Panel A: Option Imbalances of Customers											
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	t-stat
						Small C	ustomers					
Mean	-20,970	1,810	15,001	12,645	6,540	13,249	13,256	17,733	19,414	23,335	44,156	(5.19)
						Medium (	Customers					
Mean	-1,830	-1,079	-4,913	-176	-581	1,311	1,409	1,985	1,188	1,741	3,560	(1.95)
						Large Ci	ustomers					
Mean	9,897	9,787	14,807	5,130	393	6,384	13,692	9,408	6,440	5,390	-4,541	(-0.55)
					Panel B:	Relative Op	oen Interest					
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	t-stat
Mean	0.089%	0.134%	0.210%	0.331%	0.465%	0.605%	0.847%	0.981%	1.108%	1.409%	1.320%	(19.32)

ILIAS FILIPPOU, PEDRO A. GARCIA-ARES, FERNANDO ZAPATERO BETTING ON THE LIKELIHOOD OF A SHORT SQUEEZE 19 /26

	Empirical Results	
	000000000	

## STD(DIPS) AND ROBINHOOD POPULARITY

	Robinhood Popularity												
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	t-stat	
Mean	632	490	413	406	474	515	517	609	761	1192	560	(17.60)	

 ILIAS FILIPPOU, PEDRO A. GARCIA-ARES, FERNANDO ZAPATERO

 BETTING ON THE LIKELIHOOD OF A SHORT SQUEEZE
 20 /26

## STD(DIPS) AND SHORT SQUEEZE TRIGGERS

Panel A: Portfolios of ATM options sorted based on Abnormal Volume and std(DIPS)									
	Low std(DIPS)	P2	P3	P4	High std(DIPS)	HML	t-stat		
Low Abnormal Volume High Abnormal Volume	-0.010	-0.012	-0.016	-0.020	-0.032	-0.022	(-8.65) (-9.55)		
					Sentiment and avg(DI		( 5.55)		
rallel D: F	ortiolios of ATW opt	ions sorted	based on	or mings :	Sentiment and avg(Di	-5)			
	Low avg(DIPS)	P2	P3	P4	High avg(DIPS)	HML	t-stat		
Low Sentiment	-0.012	-0.014	-0.018	-0.024	-0.032	-0.021	(-7.80)		
High Sentiment	-0.015	-0.019	-0.027	-0.036	-0.047	-0.032	(-11.02)		
Panel C: Portfolios of ATM options sorted based on earnings surprises and std(DIPS)									
	Low std(DIPS)	P2	P3	P4	High std(DIPS)	HML	t-stat		
Low Earnings Surprises High Earnings Surprises	-0.014 -0.012	-0.016 -0.013	-0.022 -0.021	-0.028 -0.025	-0.038 -0.037	-0.024 -0.025	(-9.75) (-9.42)		

ILIAS FILIPPOU, PEDRO A. GARCIA-ARES, FERNANDO ZAPATERO BETTING ON THE LIKELIHOOD OF A SHORT SQUEEZE 21 /26

INTRODUCTION LITER	ature Dataset	Empirical Results	Conclusions	Appendix
		0000000000		

# Threshold List and Fails to Deliver of STD(DIPS) Portfolios

	Panel A: Percentage of firms in Threshold List											
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	t-stat
Mean	0.00%	0.00%	0.04%	0.09%	0.10%	0.10%	0.20%	0.20%	0.33%	1.85%	1.85%	(10.25)
Panel B: Fails to Deliver												
					Panel	B: Fails t	o Deliver					
	P1	P2	P3	P4	Panel P5	<i>B</i> : Fails to P6	o Deliver P7	P8	P9	P10	P10-P1	t-stat

ILIAS FILIPPOU, PEDRO A. GARCIA-ARES, FERNANDO	Zapatero
Betting on the Likelihood of a Short Squeeze	22 /26

				Empirical Results 000000000		
--	--	--	--	--------------------------------	--	--

## BLOCK-HOLDER OWNERSHIP OF STD(DIPS) PORTFOLIOS

Equally-weighted Portfolios												
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	t-stat
Median Median Number of Blocks	20.021 2.513	22.357 2.771	24.534 2.997	26.614 3.207	28.463 3.376	30.254 3.529	31.424 3.554	32.947 3.669	34.403 3.650	36.731 3.541	16.710 1.029	(29.81) (14.79)

		Conclusions •	

### CONCLUSIONS

- Probability of a short-squeeze is a proxy for right-skewness.
- Skewness-seeking investors focus on call options.
- They pay a premium for this opportunity.
- We use a proprietary measure to estimate the probability.
- But our results are robust to other measures.

Appendix •0

# LOTTERYNESS PROXIES: AVERAGE DIPS, MAX(DIPS) AND STD(DIPS)

Pa	nel A: Portfolios of AT	'M option	s sorted b	ased on a	vg(DIPS) and std(DIP	S)			
	Low std(DIPS)	P2	P3	P4	High std(DIPS)	HML	t-stat		
Low avg(DIPS) High avg(DIPS)	0.229 0.146	0.153 0.125	0.155 0.097	0.112 0.022	0.097 -0.010	-0.132 -0.156	(-2.79) (-3.76)		
Pa	nel B: Portfolios of AT	'M option	s sorted b	ased on s	td(DIPS) and avg(DIP	S)			
	Low avg(DIPS)	P2	P3	P4	High avg(DIPS)	HML	t-stat		
Low std(DIPS) High std(DIPS)	0.250 0.112	0.228 0.081	0.165 0.091	0.180 0.090	0.220 -0.049	-0.030 -0.162	(-0.74) (-3.97)		
Panel C: Portfolios of ATM options sorted based on 3 months max(DIPS) and std(DIPS)									
	Low std(DIPS)	P2	P3	P4	High std(DIPS)	HML	t-stat		
Low max(DIPS) High max(DIPS)	0.257 0.111	0.182 0.097	0.201 0.085	0.231 0.050	0.110 -0.005	-0.147 -0.116	(-3.08) (-2.98)		
Panel D: Portfolios of ATM options sorted based on 3 months std(DIPS) and max(DIPS))									
	Low max(DIPS)	P2	P3	P4	High max(DIPS)	HML	t-stat		
Low std(DIPS) High std(DIPS)	0.243 0.108	0.222 0.087	0.177 0.087	0.211 0.065	0.191 -0.023	-0.052 -0.131	(-1.31) (-3.73)		

ILIAS FILIPPOU, PEDRO A. GARCIA-ARES, FERNANDO ZAPATERO

Betting on the Likelihood of a Short Squeeze 25 /26

# LOTTERYNESS PROXIES: AVERAGE DIPS, MAX(DIPS) AND STD(DIPS)

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	t-stat
EW	-0.012	-0.013	-0.016	-0.010	-0.018	-0.027	-0.030	-0.031	-0.046		-0.035	(-5.48)
OIW	-0.013	-0.011	-0.016	-0.006	-0.021	-0.036	-0.035	-0.041	-0.054	-0.056	-0.043	(-4.42

	CAPI	1 Three-Factor	Four-Factor	Five-Factor		
-						
EV			-0.035	-0.036		
	(-5.1)	) (-5.27)	(-5.28)	(-5.51)		
OI	N -0.03	-0.031	-0.031	-0.031		
	(-6.92	) (-6.64)	(-6.79)	(-6.71)		

Ilias Filippou, Pedro .	A. Garcia-Ares,	Fernando	Zapatero
Betting on the Likeli	hood of a Short	Squeeze	26/26