

Average number of jumps per year

	No thresholding	Universal threshold	FDR threshold
MMM	66.7	15.0	36.7
AA	66.0	14.3	29.0
AXP	75.0	19.0	36.7
T	90.0	30.7	57.3
BAC	66.7	15.7	28.3
BA	58.7	12.3	22.3
CAT	61.7	15.0	25.7
CVX	50.3	7.7	18.7
KO	80.7	29.3	47.7
DD	77.7	25.0	47.0
XOM	51.3	9.0	15.0
GE	80.7	23.0	48.7
HPQ	76.0	19.7	43.3
HD	63.7	15.7	25.7
INTC	97.0	30.3	68.0
IBM	69.3	16.3	27.7
JNJ	74.0	23.7	43.0
JPM	63.3	14.3	26.7
KFT	116.3	46.7	83.3
MCD	86.7	31.0	56.7
MRK	71.7	21.0	41.7
MSFT	98.3	35.0	67.0
PFE	90.3	26.7	59.0
PG	66.7	21.3	37.0
UTX	70.0	15.7	33.7
VZ	88.0	28.0	52.7
WMT	59.0	13.0	26.7
DIS	87.0	26.7	59.7
mean	75.1	21.5	41.6
median	72.8	20.3	39.3
min	50.3	7.7	15.0
max	116.3	46.7	83.3

Average number of jumps per year

- Between 50 and 110 jumps per year *before* thresholding
- Between 15 and 80 jumps per year *after* thresholding
- Around **50%** of jumps detected initially are spurious detections.

Jump dynamics

- Empirical option pricing literature: jumps necessary to capture short-term skew.
- Are jump arrival times driven by a simple **Poisson** process?
 - → Goodness of fit test that jump arrival times follow an **exponential** distribution (Kolmogorov-Smirnov)
 - → Test of **serial dependence** of durations between jumps (Ljung-Box)

Monte Carlo study

Frequency		Duration between jumps	
		Exponential	Weibull
30 sec	BNS Thresh	4	100
	BNS	5	100
1 min	BNS Thresh	6	100
	BNS	6	100
5 min	BNS Thresh	42	92
	BNS	6	84
true jumps		5	100

- Proportion of rejections of the null hypothesis that arrival times follow an exponential distribution (using the KS test) (1'000 Monte Carlo iterations)
- Arrival times generated from respectively an exponential ($\lambda=20$), and a Weibull (with parameters (20,3)) distribution (in %)

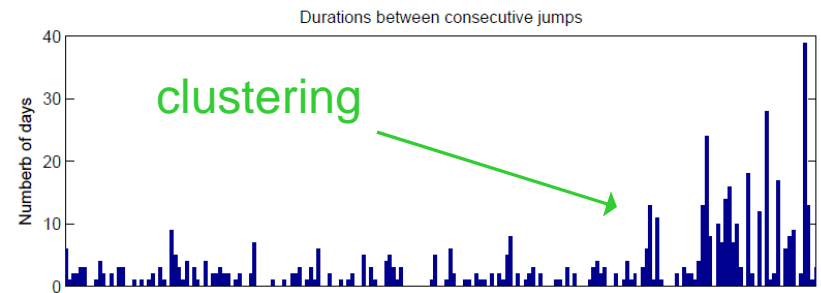
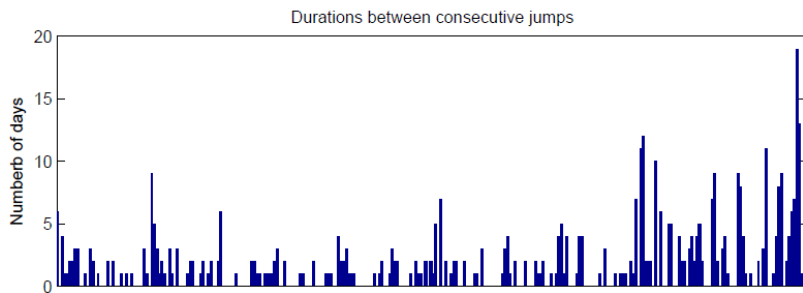
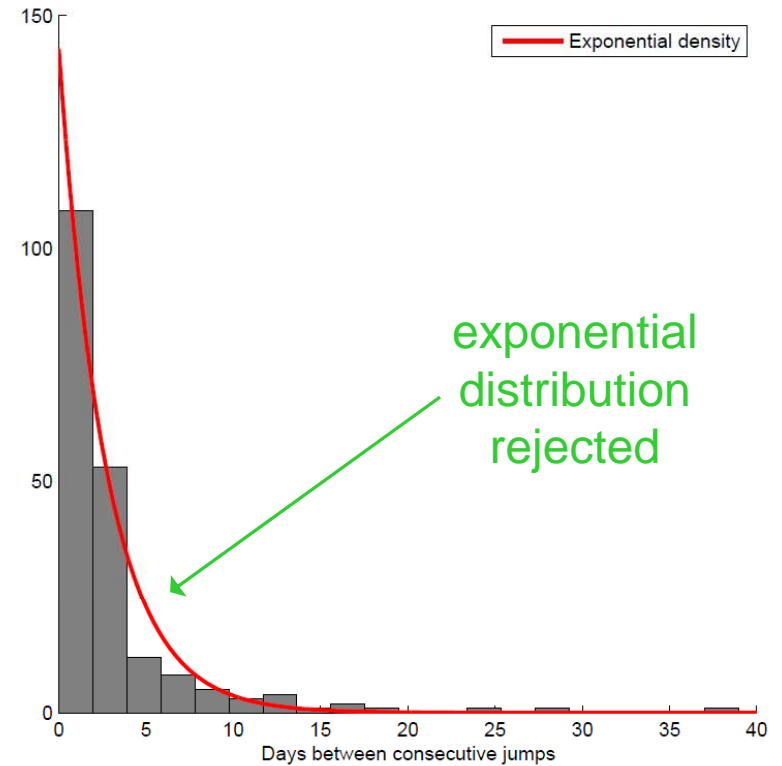
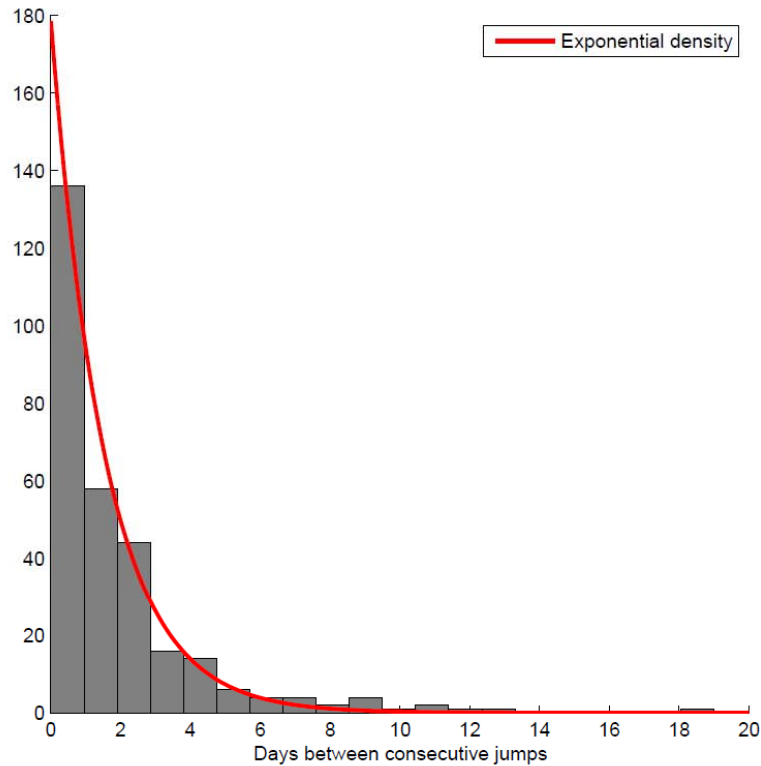
No thresholding

	KS test exp	Ljung-Box(15)	Dispersion
MMM	0.00	16.2	1.32
AA	0.00	12.6	1.04
AXP	0.00	20.5	1.46
T	0.00	28.7	1.32
BAC	0.00	35.9*	1.36
BA	0.00	21.7	1.18
CAT	0.00	24.7	1.11
CVX	0.00	12.6	1.18
KO	0.00	14.1	1.30
DD	0.00	37.0*	1.41
XOM	0.00	12.4	1.28
GE	0.00	7.6	1.39
HPQ	0.00	20.4	1.26
HD	0.00	9.6	1.10
INTC	0.00	12.5	1.48
IBM	0.00	16.0	1.15
JNJ	0.00	34.9*	1.23
JPM	0.00	37.3*	1.33
KFT	0.00	42.3*	1.66
MCD	0.00	11.5	1.45
MRK	0.00	10.0	1.26
MSFT	0.00	83.0*	1.60
PFE	0.00	24.1	1.34
PG	0.00	20.1	1.28
UTX	0.00	14.6	1.31
VZ	0.00	14.1	1.14
WMT	0.00	12.2	1.10
DIS	0.00	42.1*	1.53
Prop. reject. (%)	100.0	28.6	

FDR thresholding

	KS test exp	Ljung-Box(15)	Dispersion
MMM	0.00	24.1	1.36
AA	0.00	16.7	1.38
AXP	0.00	25.4*	1.35
T	0.00	32.4*	1.16
BAC	0.01	84.1*	1.32
BA	0.00	18.3	1.27
CAT	0.02	13.2	1.04
CVX	0.17	10.8	1.16
KO	0.00	21.1	1.64
DD	0.00	19.0	1.37
XOM	0.07	10.0	1.26
GE	0.00	42.6*	1.35
HPQ	0.00	14.3	1.19
HD	0.00	5.1	1.55
INTC	0.00	37.2*	1.45
IBM	0.04	13.6	1.12
JNJ	0.00	15.0	1.46
JPM	0.00	33.8*	1.44
KFT	0.00	36.8*	1.83
MCD	0.00	15.3	1.55
MRK	0.00	20.8	1.18
MSFT	0.00	125.6*	1.78
PFE	0.00	39.7*	1.37
PG	0.00	18.7	1.24
UTX	0.00	14.6	1.20
VZ	0.00	16.5	1.05
WMT	0.00	7.8	1.30
DIS	0.00	8.4	1.91
Prop. reject. (%)	92.9	32.1	

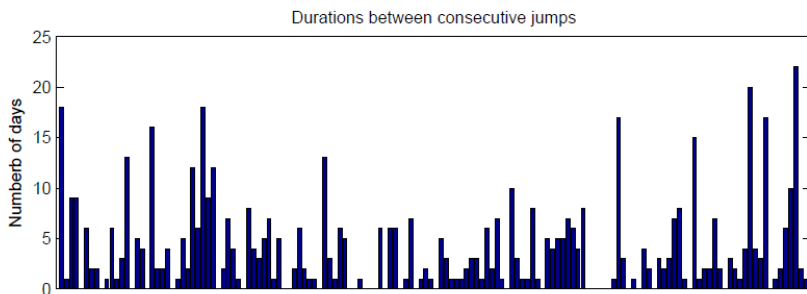
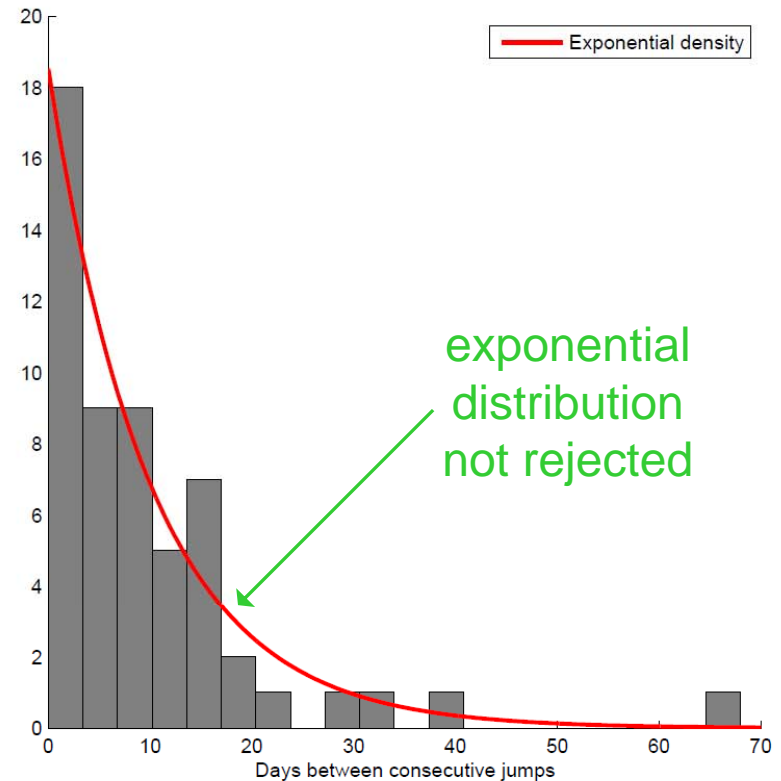
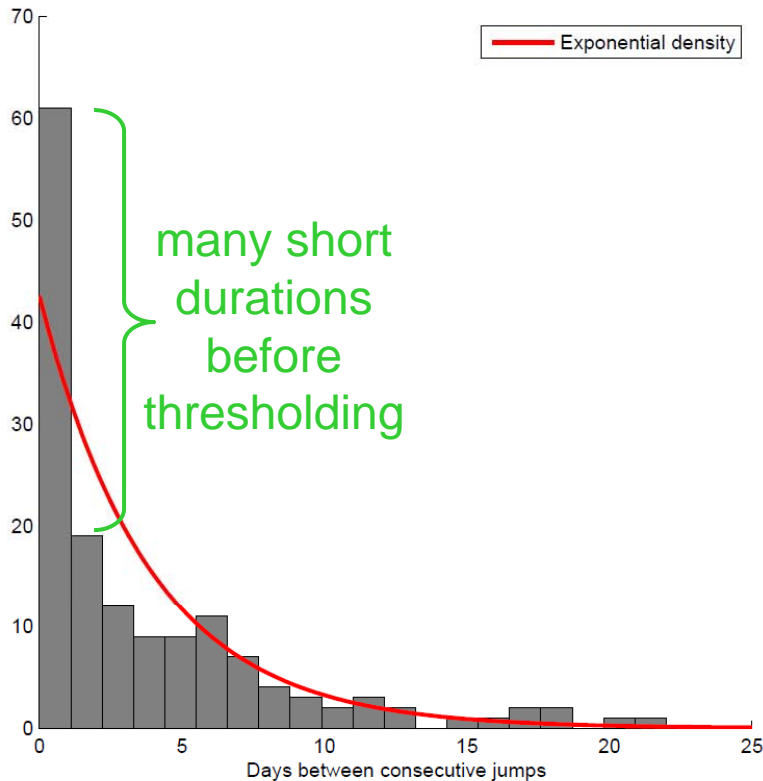
Histograms of jump arrival times: MSFT



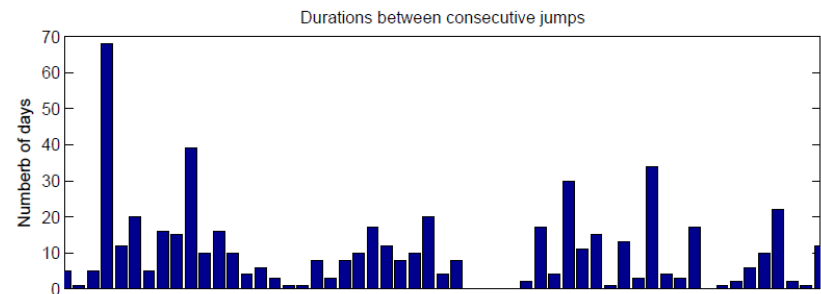
(a) No thresholding

(b) FDR thresholding

Histograms of jump arrival times: CVX



(a) No thresholding



(b) FDR thresholding

Jump dynamics: conclusions

- No seasonality, e.g. **quarterly earnings announcements** and **dividends** do not systematically induce a jump.
- Null hypothesis that jump arrival times are driven by a **simple Poisson process rejected** for most Dow Jones stocks.
 - Exponentiality of durations rejected for 90% of stocks
 - Serial dependence of durations for 30% of stocks

Extensions

- Relation to news releases (FACTIVA)