DURATIONS OF TRADE IN THE PHILIPPINE STOCK MARKET: AN APPLICATION OF THE MARKOV-SWITCHING MULTI-FRACTAL DURATION MODEL

By

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Presented by

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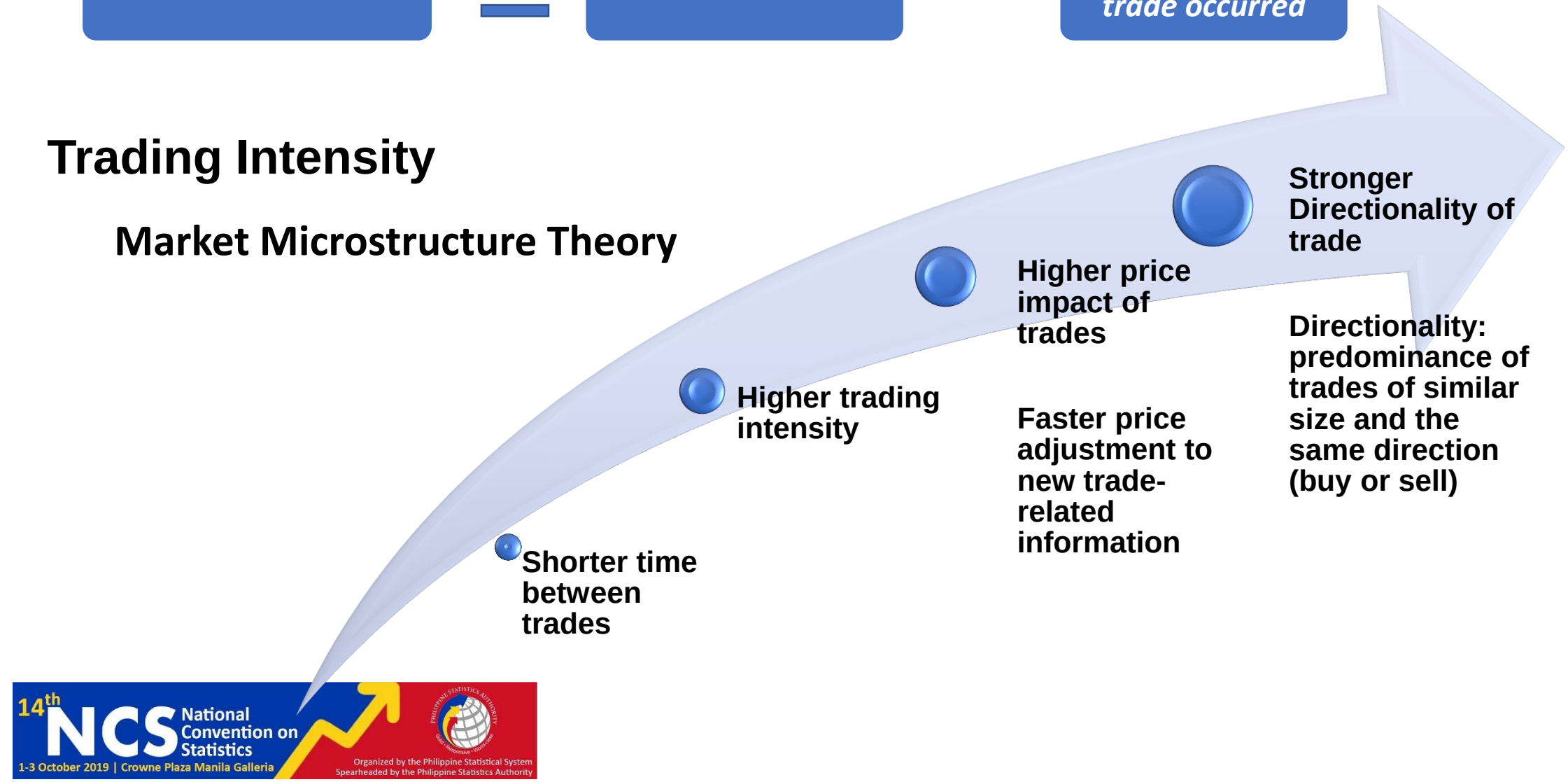
- EVERY SECOND AND EVERY MINUTE COUNTS

Inter-trade durations

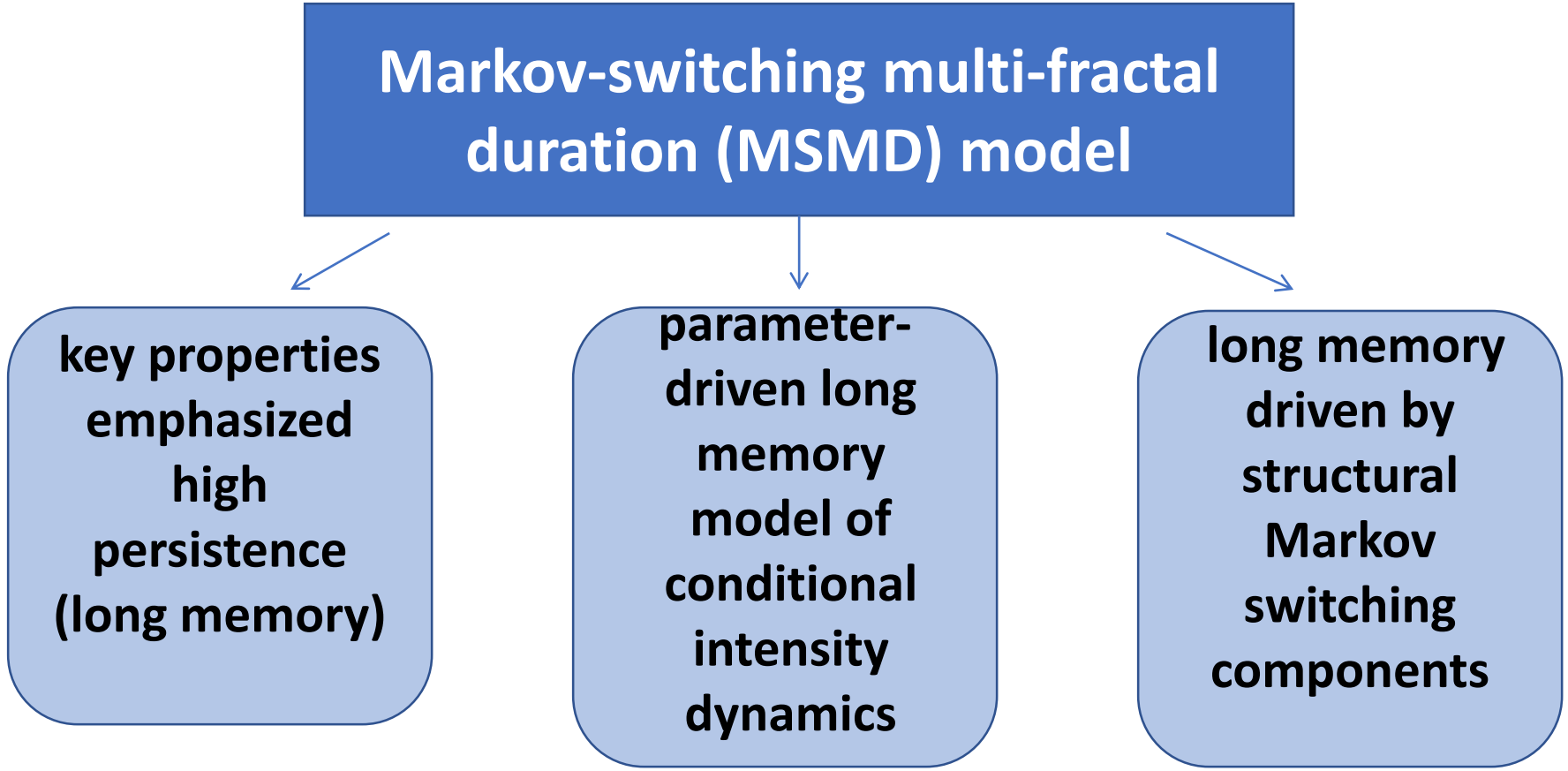
Duration *i* (d_i) between trade events = ***Time period, t_i, when trade occurred*** − ***Previous time period, t_{i-1}, when trade occurred***

Trading Intensity

Market Microstructure Theory

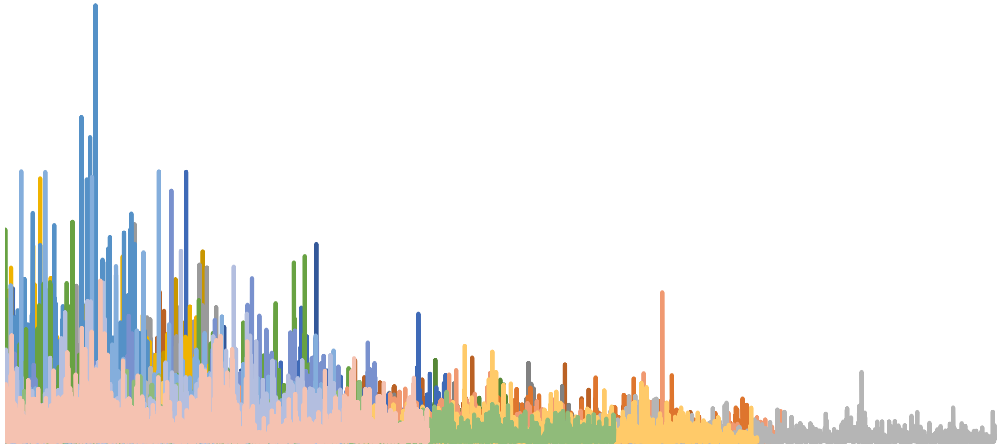


Analysis of Inter-trade durations



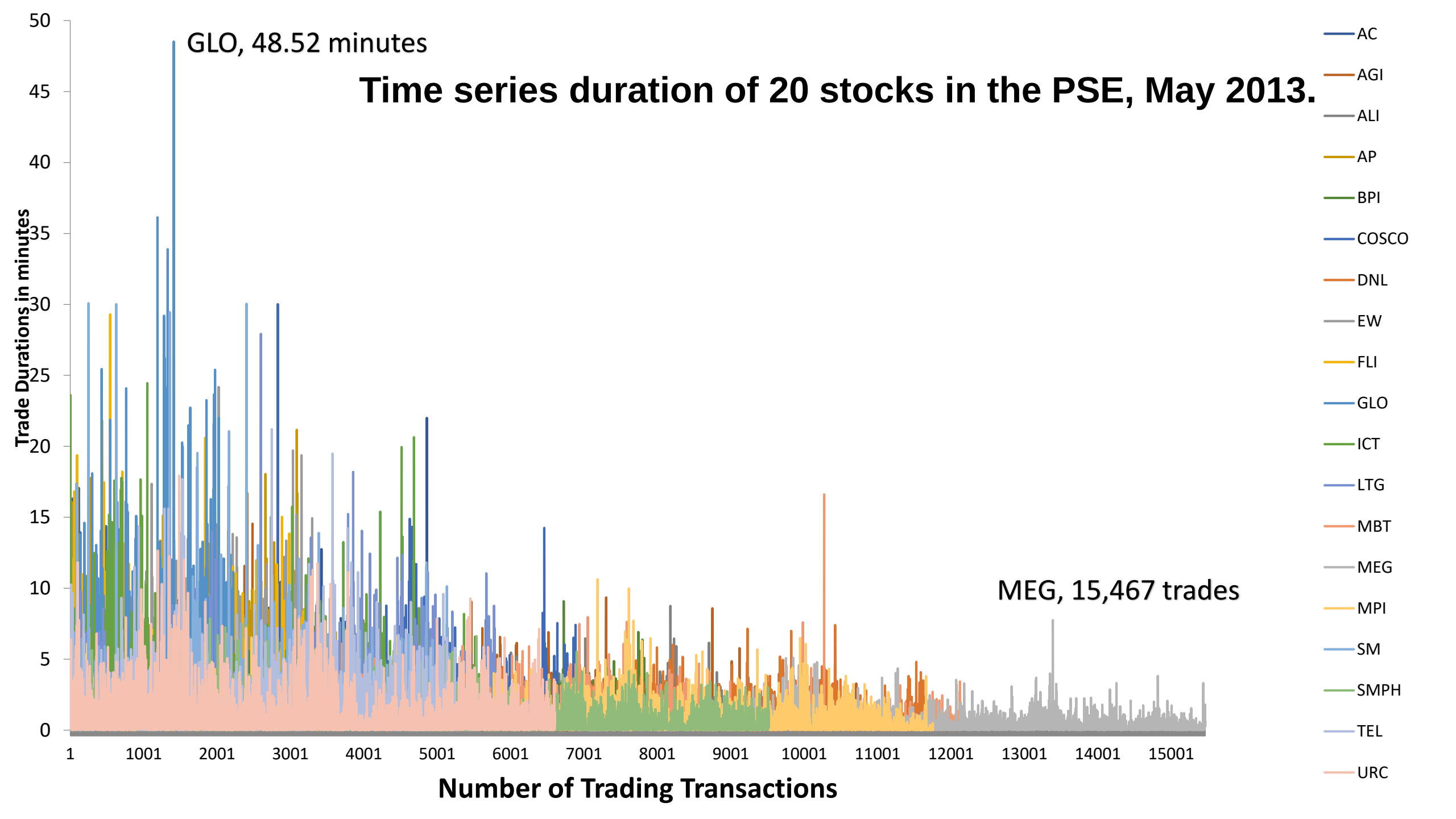
Methodology

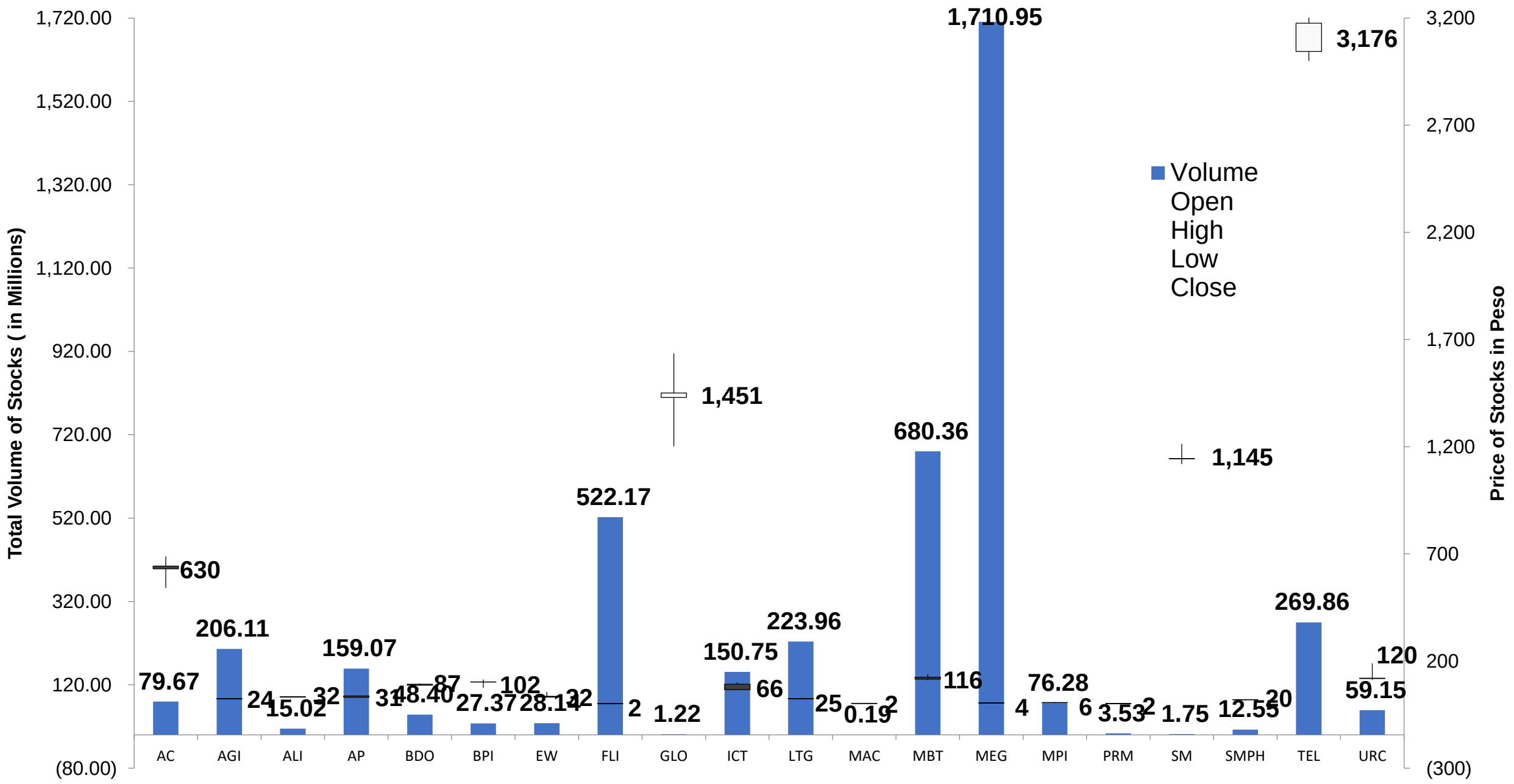
1. Trend Analysis of Philippine Stock Exchange (20 frequently traded stocks)
2. Calculating the raw durations and measurement of intra-day calendar effects
3. Estimation of the MSMD Model parameters through Maximum Likelihood Estimation (MLE)



$$d_i = t_i - t_{i-1} \qquad \log d_i = \sum_{k=i}^{9} \alpha_k x_{ki} + \varepsilon_i = \alpha' x_i + \varepsilon_i$$

$$\theta_{\bar{k}} = (\gamma_k, b, m_0)'$$


GLO, 48.52 minutes
Time series duration of 20 stocks in the PSE, May 2013.
MEG, 15,467 trades
Trade Durations in minutes
Number of Trading Transactions
0
5
10
15
20
25
30
35
40
45
50
1
1001
2001
3001
4001
5001
6001
7001
8001
9001
10001
11001
12001
13001
14001
15001
AC
AGI
ALI
AP
BPI
COSCO
DNL
EW
FLI
GLO
ICT
LTG
MBT
MEG
MPI
SM
SMPH
TEL
URC

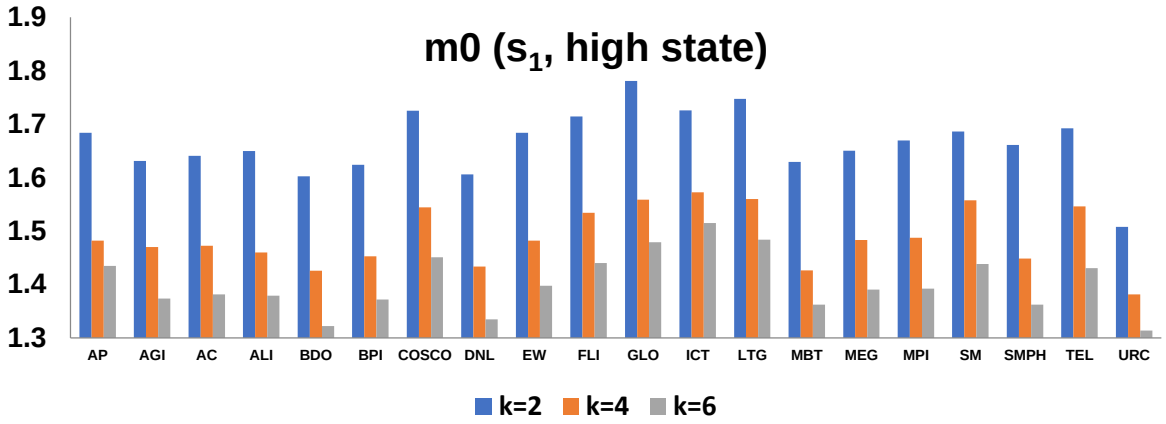


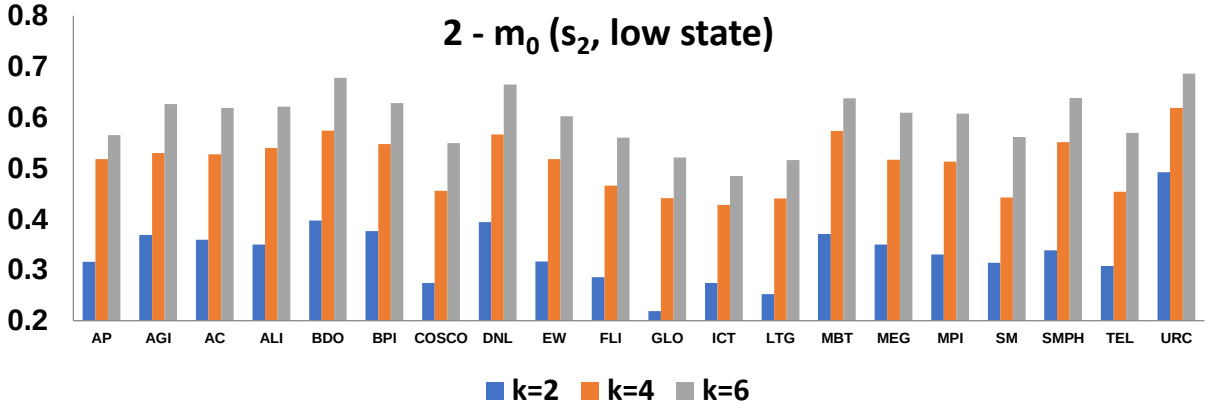
Volume of transactions and prices of top 20 stocks in PSE, May 2013.

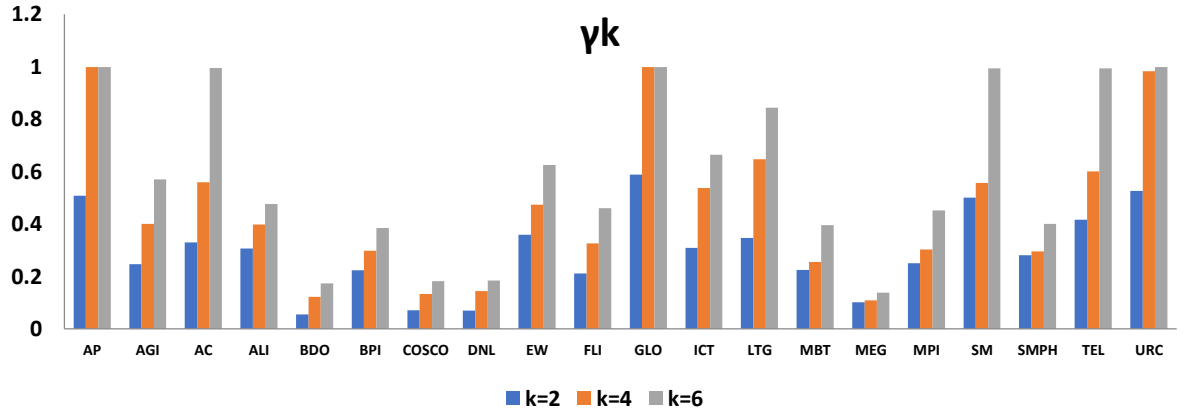
Firm-by-firm descriptive statistics of stocks in the PSE.

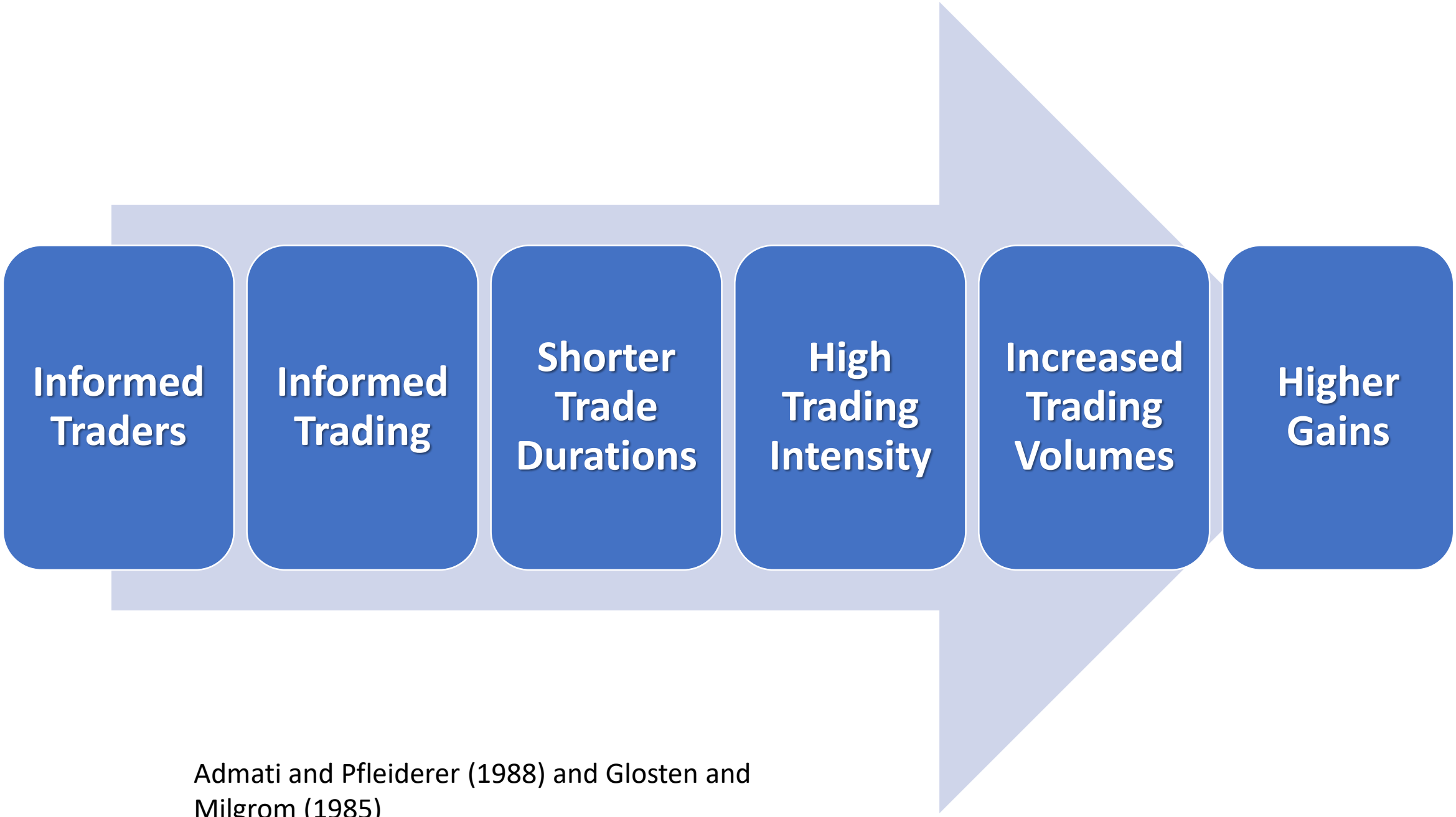
Stock	Mean	Standard Deviation	Coefficient of Variation	Standard Error	Min	Max	N
AC	0.9430	1.36	1.45	0.0176	0.0167	22.00	5,970
AGI	0.5269	0.79	1.49	0.0076	0.0167	16.70	10,723
ALI	0.5822	0.75	1.28	0.0076	0.0167	9.87	9,681
AP	1.5159	2.01	1.32	0.0331	0.0167	21.13	3,670
BDO	0.3877	0.51	1.32	0.0042	0.0167	6.37	14,554
BPI	0.7090	0.90	1.27	0.0101	0.0167	9.35	7,908
COSCO	0.5989	1.15	1.92	0.0122	0.0167	30.02	8,911
DNL	0.4824	0.62	1.28	0.0057	0.0167	7.40	11,631
EW	1.6296	2.21	1.36	0.0380	0.0167	24.18	3,401
FLI	1.7332	2.39	1.38	0.0422	0.0167	29.30	3,212
GLO	2.4132	3.63	1.51	0.0757	0.0167	45.52	2,302
ICT	1.0049	1.77	1.76	0.0238	0.0167	24.45	5,569
LTG	0.9641	1.54	1.60	0.0202	0.0167	27.92	5,832
MBT	0.4656	0.65	1.40	0.0059	0.0167	16.62	12,135
MEG	0.3645	0.56	1.53	0.0045	0.0167	9.22	15,467
MPI	0.4788	0.66	1.39	0.0061	0.0167	10.63	11,755
SM	0.9933	1.64	1.65	0.0221	0.0167	30.08	5,504
SMPH	0.5615	0.73	1.29	0.0074	0.0167	7.87	9,518
TEL	1.0654	1.56	1.46	0.0215	0.0167	21.20	5,251
URC	0.8478	1.23	1.45	0.0152	0.0167	17.92	6,604

*Coefficient of Variation = standard deviation/mean









Admati and Pfleiderer (1988) and Glosten and Milgrom (1985)

Recommendations

- ***To fully analyze the transition probabilities from low state to high state,***
  - out-of-sample forecast and simulation should be done.
  - reliability test of the results should be done to ensure its efficiency. This was not applied in the study due to the lack of program to generate the desired outputs.
- ***The risk implied in investing to different stocks should be considered.***
  - The analysis on the transition probabilities should be complemented with a gauge in risk measurement.
  - This is to further described the type of investor that would engage in a particular stock *i.e.* risk seeker, risk averse or risk neutral.