

MARCELLO MINENNA _____ **ENFORCEMENT OFFICER**

A SUPERVISORY PERSPECTIVE ON INSIDER TRADING

ESTIMATING THE VALUE OF THE INFORMATION

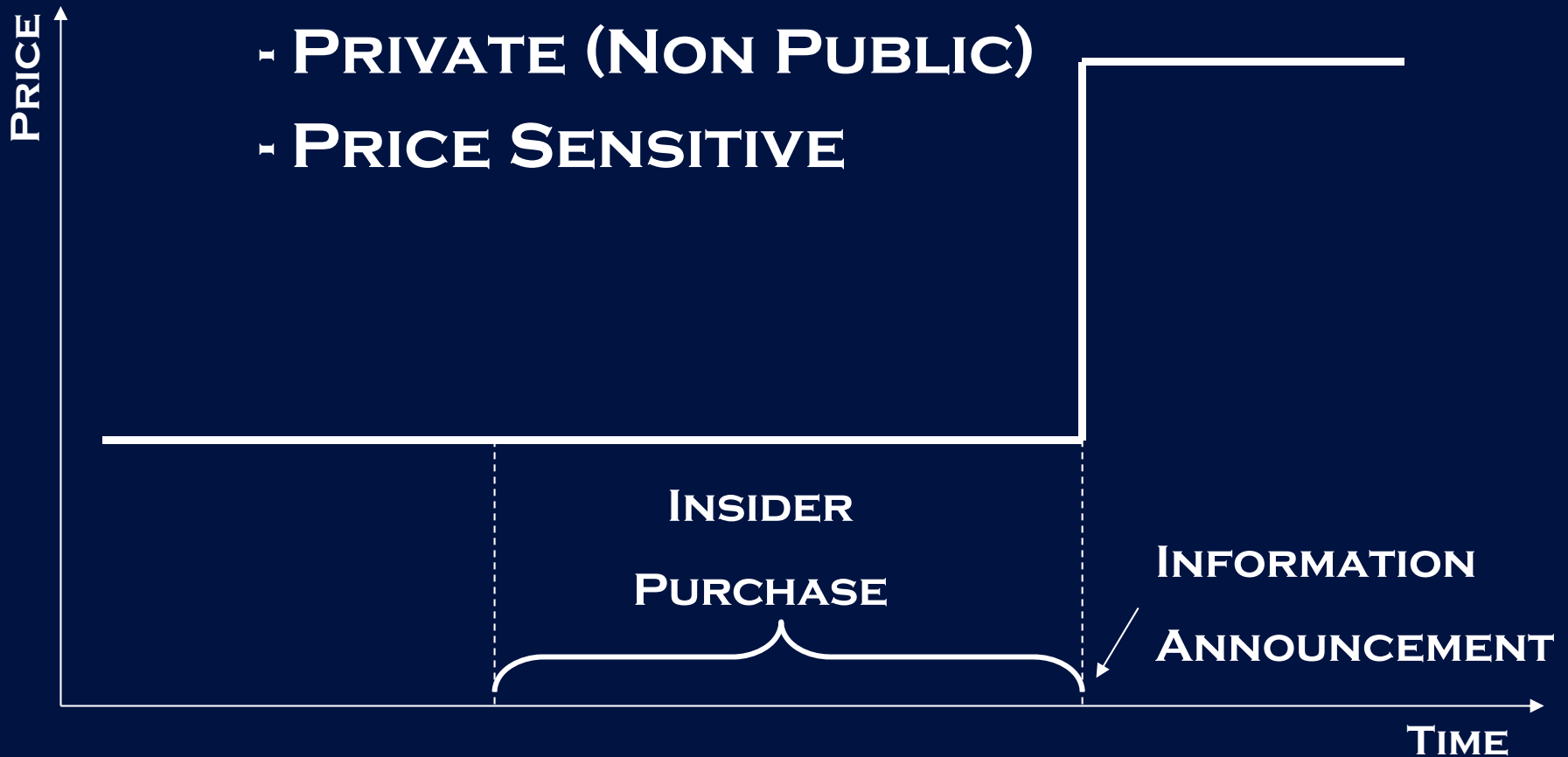
IX INTERNATIONAL "TOR VERGATA" CONFERENCE ON BANKING AND FINANCE

16TH NOVEMBER 2000

DEFINITION:

ABUSE OF INFORMATION IN THE MARKET :

- PRIVATE (NON PUBLIC)
- PRICE SENSITIVE



ELEMENTS:

- 1. STOCK AND MARKET TREND ANALYSIS**
- 2. STUDY OF THE IMPACT OF THE PREFERENTIAL INFORMATION ON THE STOCK PRICE TREND**
- 3. STUDY OF INTERMEDIARIES AND BENEFICIAL OWNERS TRADING**
- 4. COMPUTATION OF THE PROFIT GAINED BY THE INSIDER I.E. THE DISGORGEMENT**

**COMPUTATION OF THE
PROFIT GAINED BY THE
INSIDER**

I.E.

THE DISGORGEMENT

METHODS:

- ACTUAL DISGORGEMENT
- POTENTIAL DISGORGEMENT
 - o DETERMINISTIC
 - o ECONOMETRIC
 - o PROBABILISTIC

ACTUAL DISGORGEMENT

VALUE OF THE INSIDER CLOSED POSITION

—

VALUE OF THE INSIDER OPEN POSITION

ISSUES:

- **APPLICABILITY TO ALL INSIDER TRADING INVESTIGATION CASES**

EX. THE INSIDER DOES NOT CLOSE THE POSITION

POTENTIAL DETERMINISTIC DISGORGEMENT

**POST-NEWS PRICE X QUANTITY OF INSIDER
OPEN POSITION**

—

INSIDER OPEN POSITION

ISSUES:

- **APPLICABILITY TO ALL INSIDER TRADING INVESTIGATION CASES:**

EX. THE INSIDER OPENS HIS POSITION ON THE STOCK IN PERIODS FAR FROM THE DISCLOSURE OF THE PREFERENTIAL INFORMATION



CONSOB
COMMISSIONE NAZIONALE
PER LE SOCIETA' E LA BORSA



**ECONOMETRIC METHOD FOR THE
COMPUTATION OF THE DISGORGEMENT**



EVENT STUDIES ANALYSIS

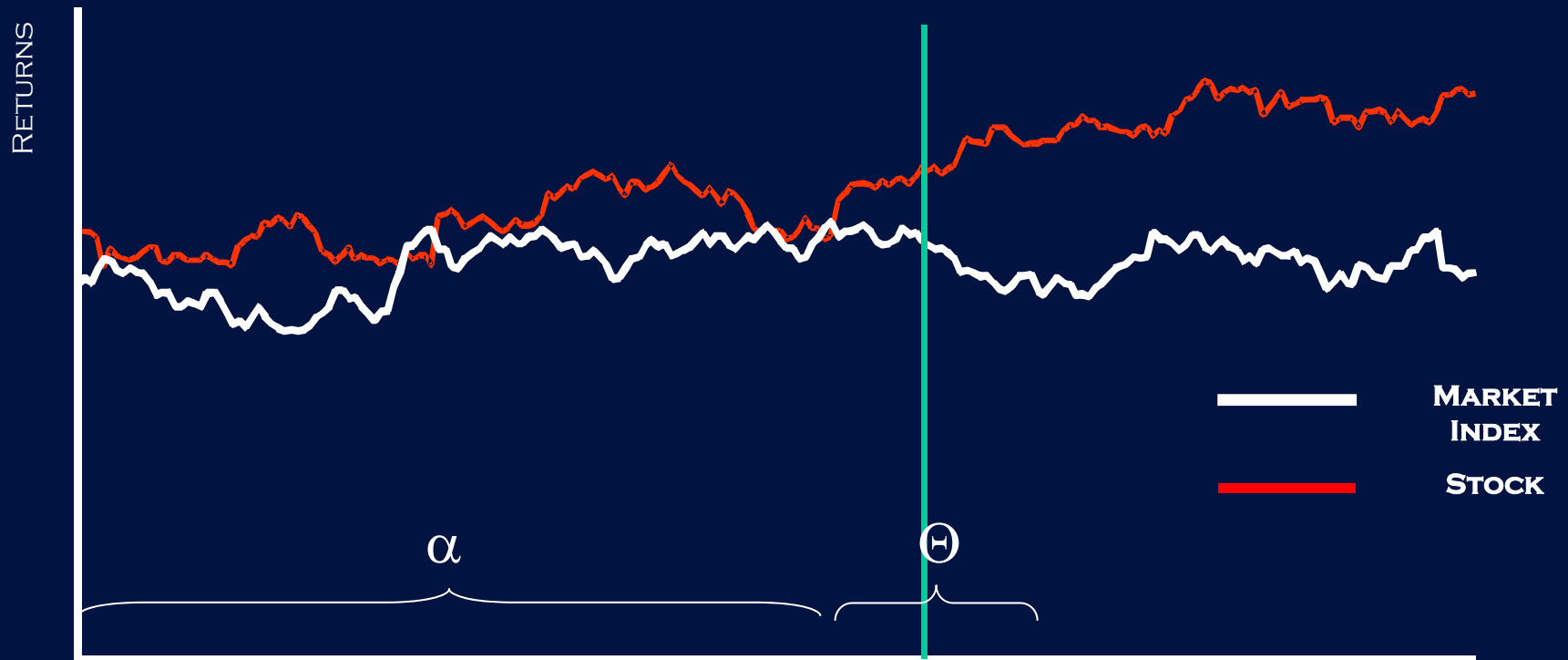
GOALS:

**QUANTIFICATION OF THE EVENT IMPACT
ON THE STOCK MARKET VALUE**

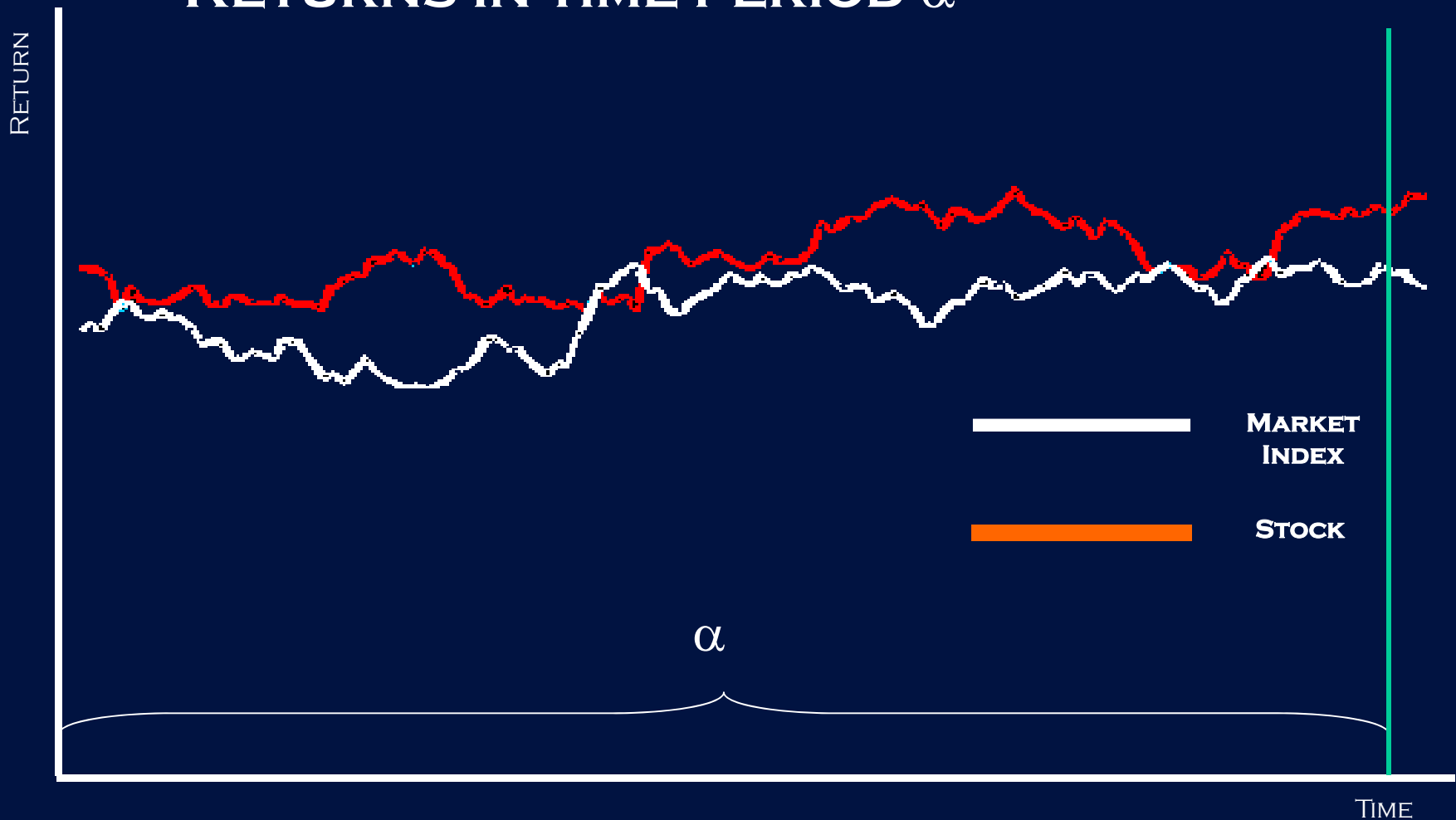
STEPS OF THE METHODOLOGY: 4

1) GENERAL CASE ANALYSIS:

DEFINITION OF 2 TIME HORIZONS : α AND Θ

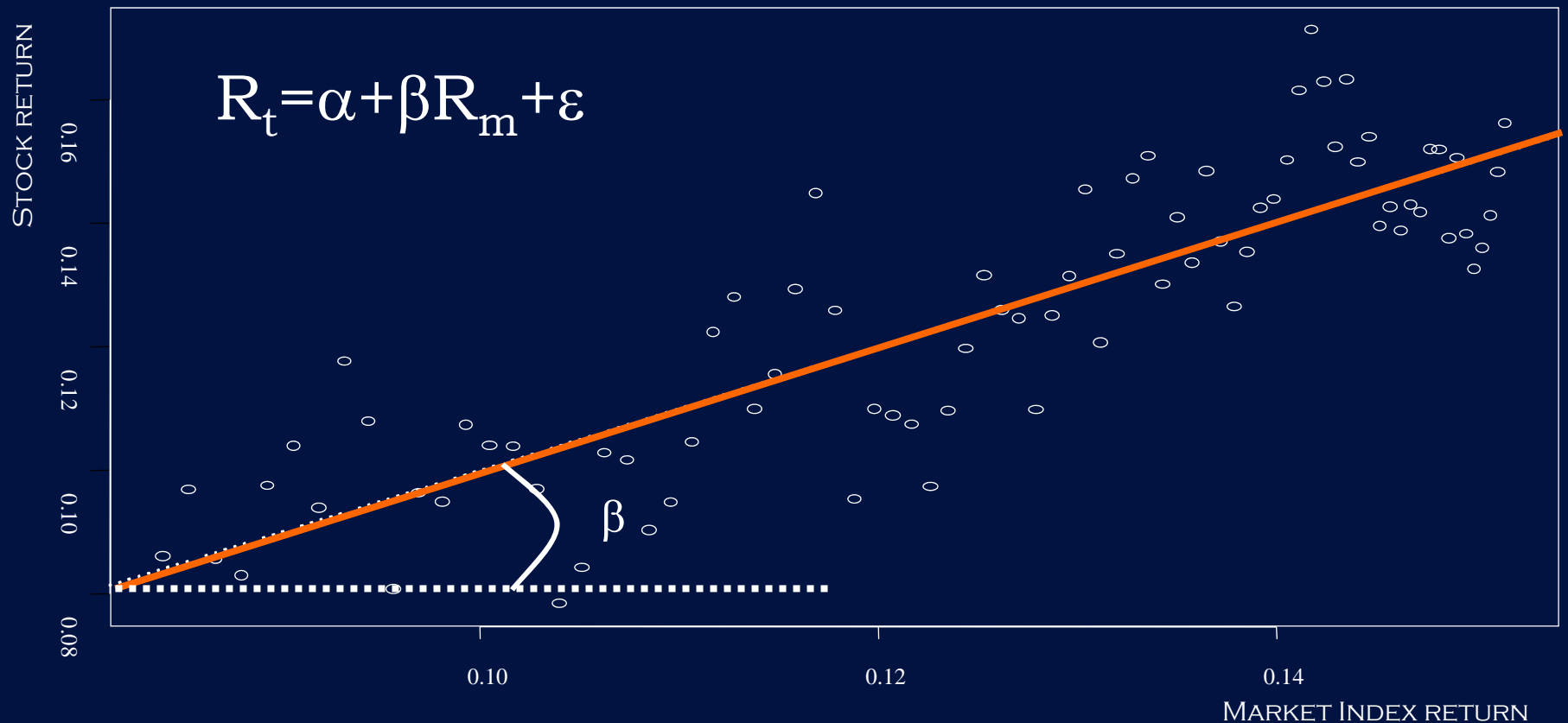


2.1) ANALYSIS OF STOCK AND MARKET INDEX RETURNS IN TIME PERIOD α



2.ii) MARKET MODEL IN TIME PERIOD

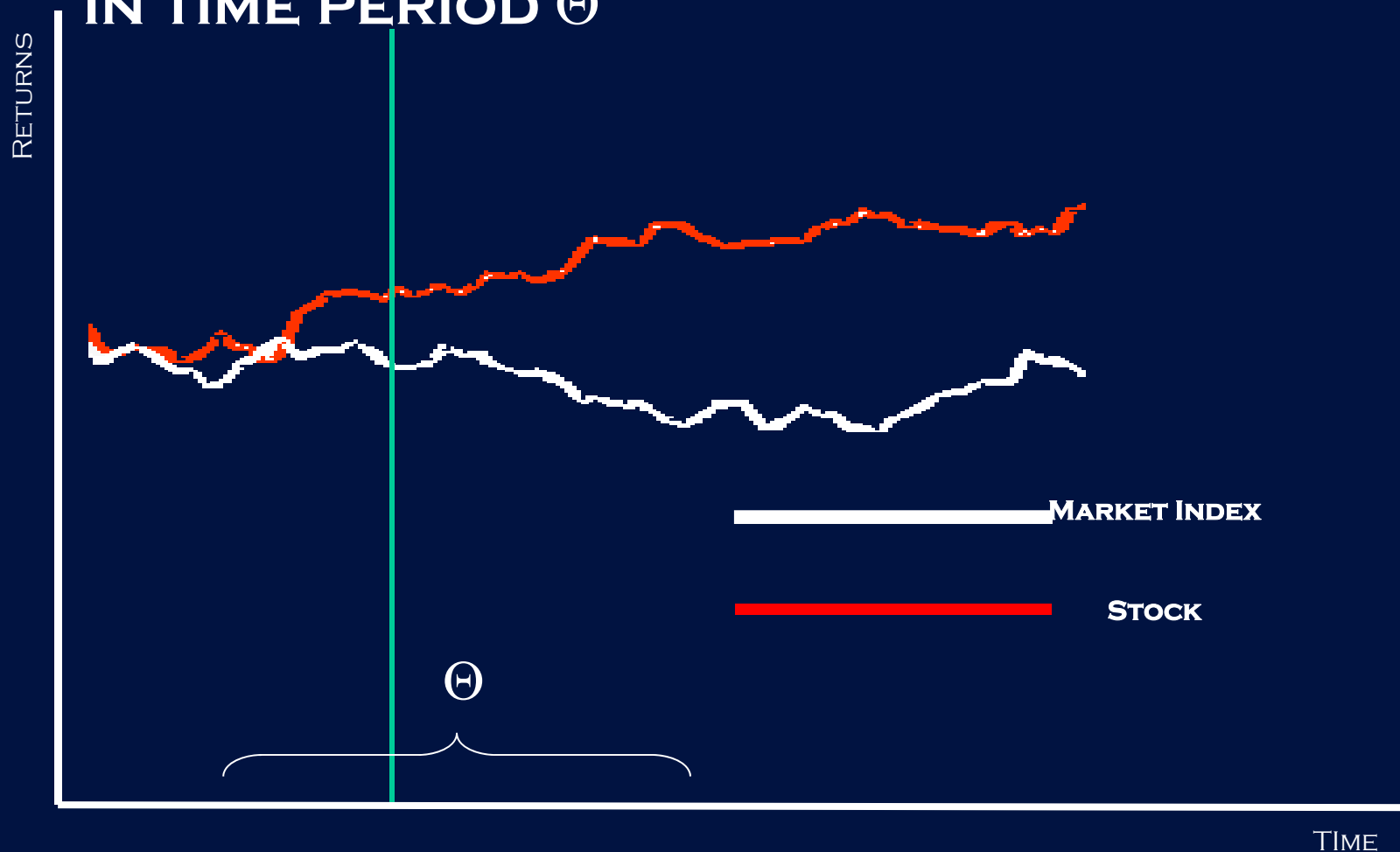
α



2.III) STATISTICAL TESTS OF THE ROBUSTNESS OF THE REGRESSION

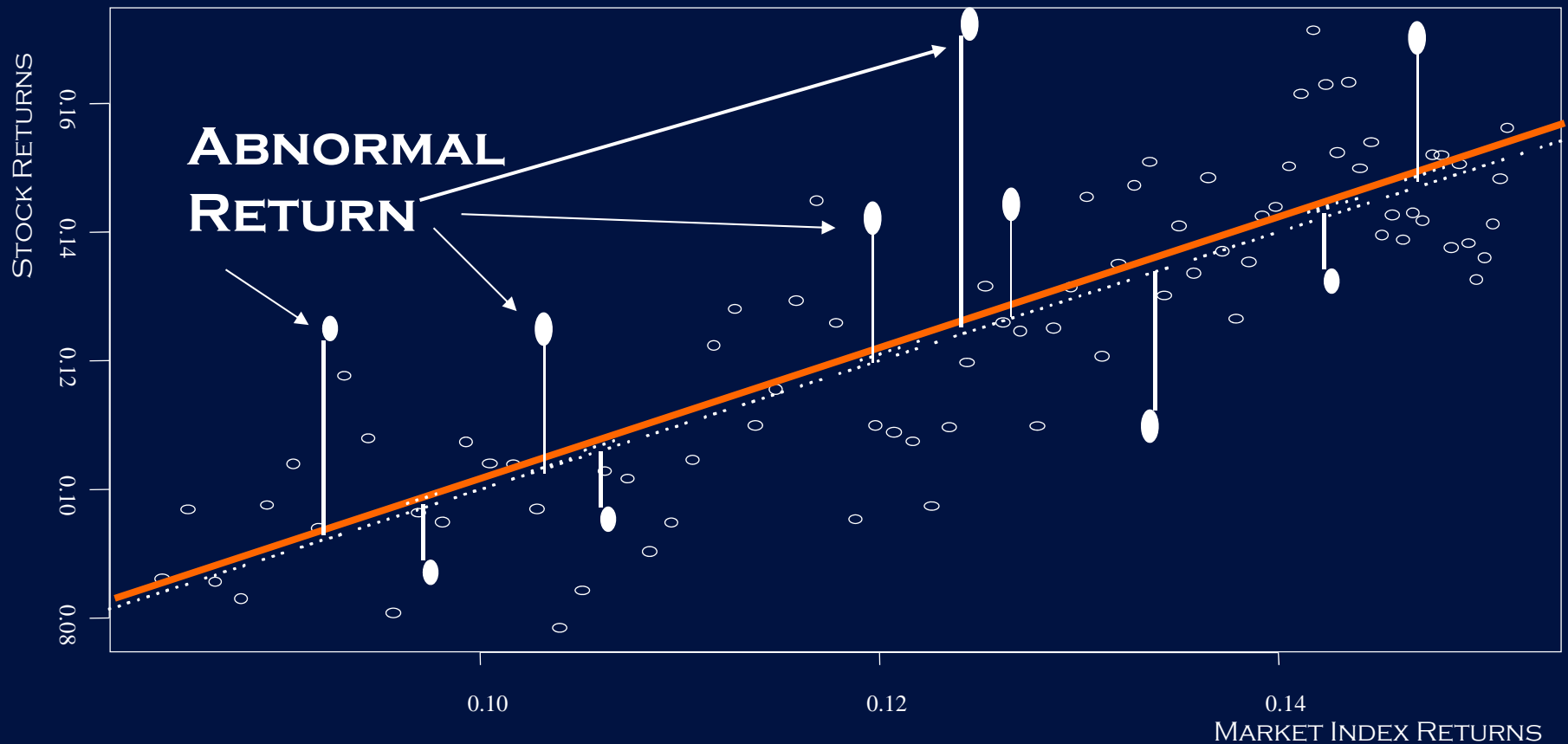
- REGRESSION COEFFICIENTS AND T STATISTIC ON COEFFICIENTS
- GRAPHICAL TESTS: RESIDUAL PLOT, QQPLOT, RESIDUALS VS FIT, RECURSIVE BETA
- NUMERICAL TESTS: BREUSH - PAGAN, LEVENE
-

3.1) STOCK AND MARKET INDEX RETURN ANALYSIS IN TIME PERIOD Θ



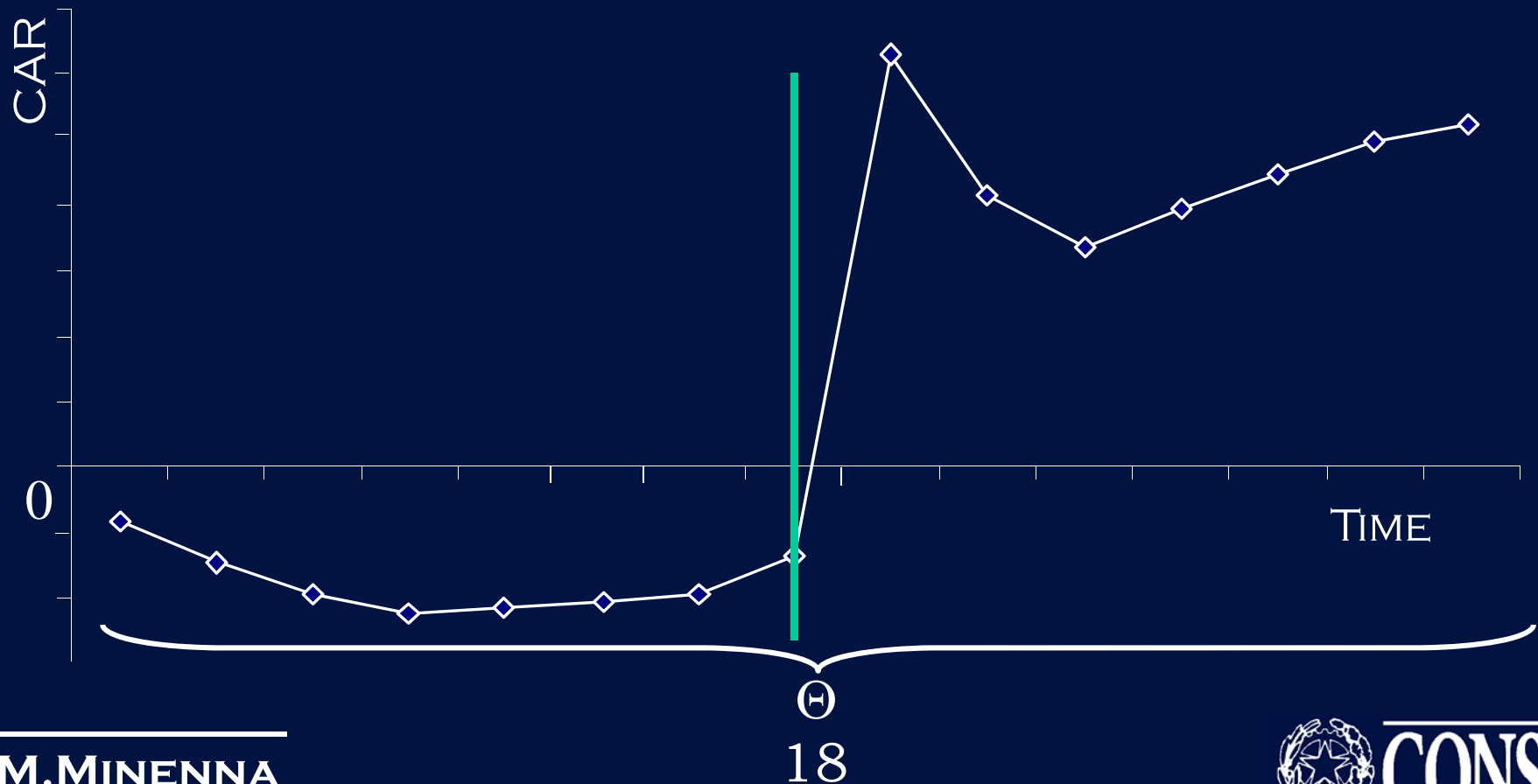
3.II) IDENTIFICATION OF ABNORMAL RETURN

$$AR = R_t - \alpha - \beta R_m$$



3.iii) STATISTICAL TEST OF THE EFFECTIVE RETURN ABNORMALITY

COMPUTATION OF THE *CUMULATIVE ABNORMAL RETURN*



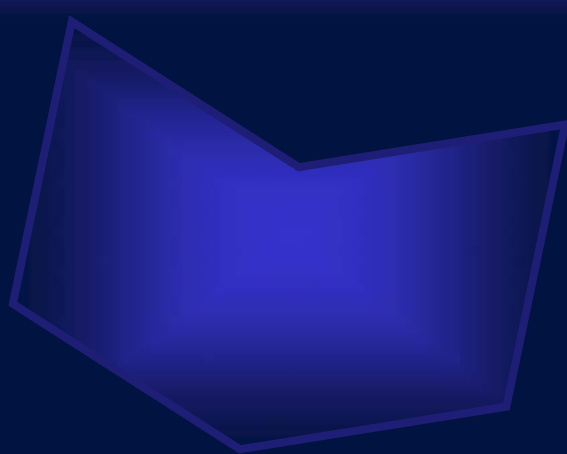
4) COMPUTATION OF THE *DISGORGEMENT*

VALUE OF INSIDER OPEN POSITION

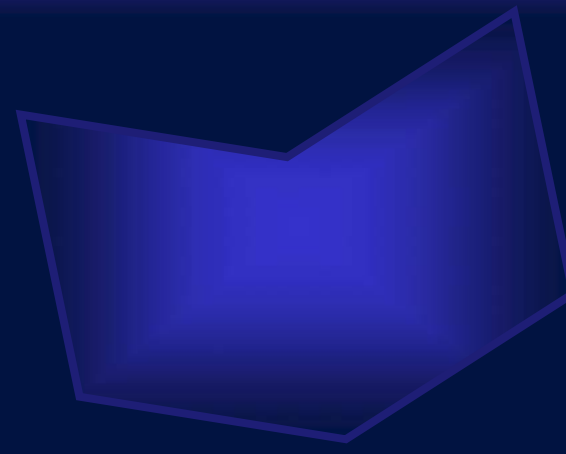
X

ABNORMAL RETURN

ECONOMETRIC METHOD FOR THE COMPUTATION OF THE DISGORGEMENT



ISSUES



CONSIDERATIONS

ISSUES

1. APPLICABILITY TO ALL INSIDER TRADING INVESTIGATION CASES :

- WIDENESS OF α
 - DATA SET AVAILABILITY
 - TIME SERIES DISCONTINUITY
 - RUMORS
 -

2. MARKET INDEX STATISTICALLY ROBUST

- ENDOGENOUS REGRESSION
- EXISTENCE OF THE INDEX
-

3. ROBUSTNESS OF THE REGRESSION

- TEMPORAL STABILITY OF THE PARAMETERS
- NON – STATIONARITY OF THE TIME SERIES
-

CONSIDERATIONS

1. TIME IS NOT INCLUDED IN THE MODEL

2. LINEAR METHOD

3. DETERMINISTIC METHOD

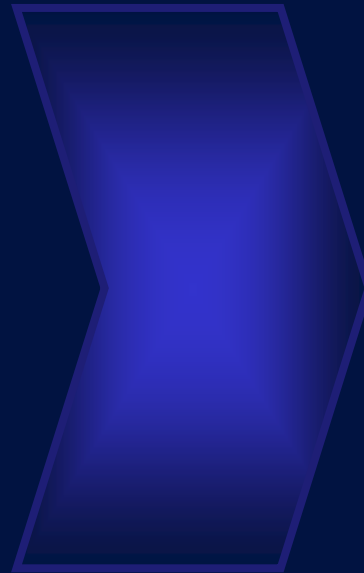
4. METHOD BASED ON THE “PAST”:

**NOT COHERENT WITH THE WEAK FORM OF MARKET
EFFICIENCY**



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**PROBABILISTIC
METHOD FOR
DISGORGEMENT
COMPUTATION**



STEPS OF THE METHODOLOGY: 4

1) GENERAL CASE ANALYSIS:

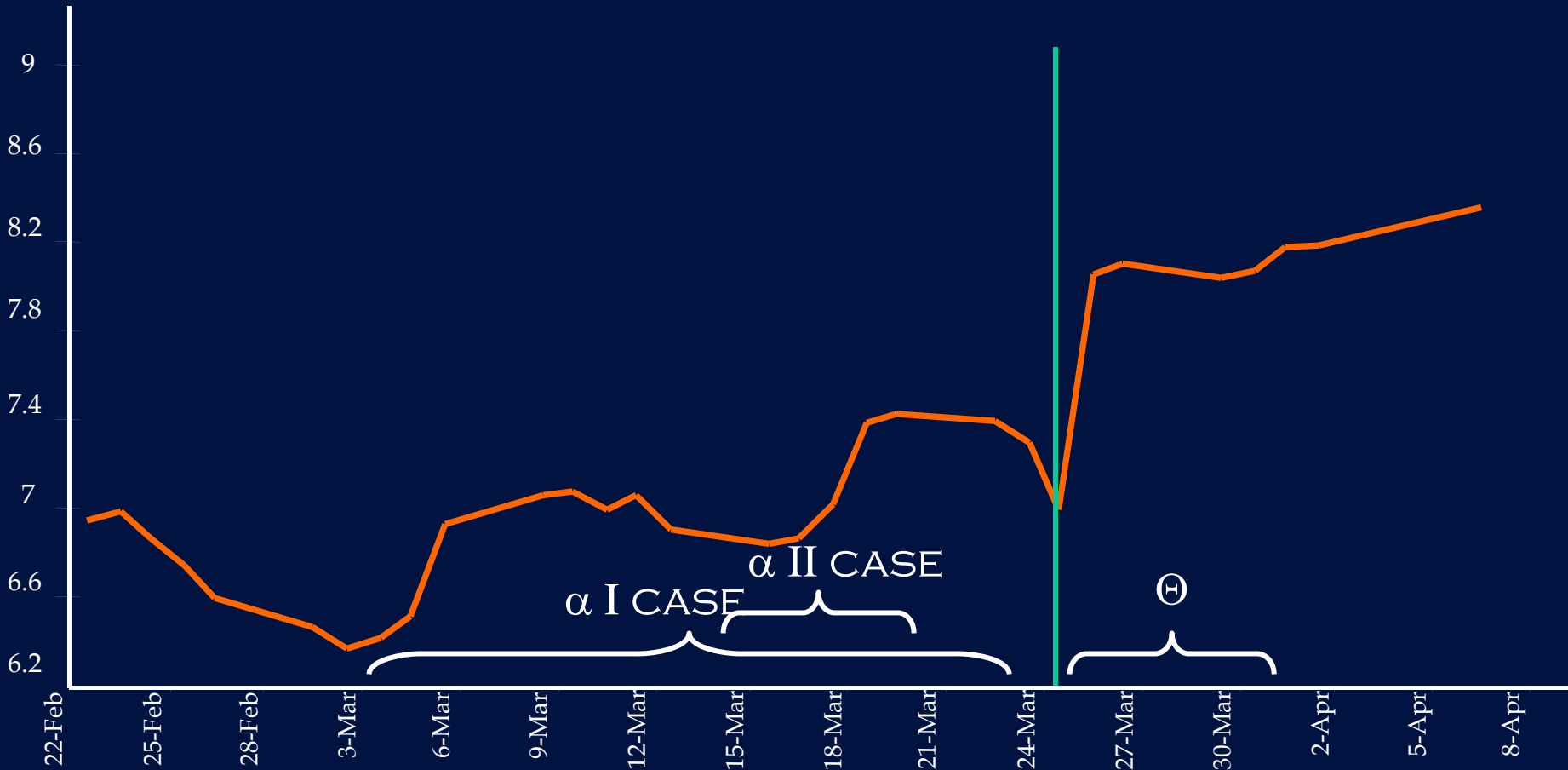
DEFINITION OF 2 TIME HORIZONS : α AND Θ

α = PERIOD IN WHICH THE INSIDER OPENS
HIS POSITION ON THE STOCK

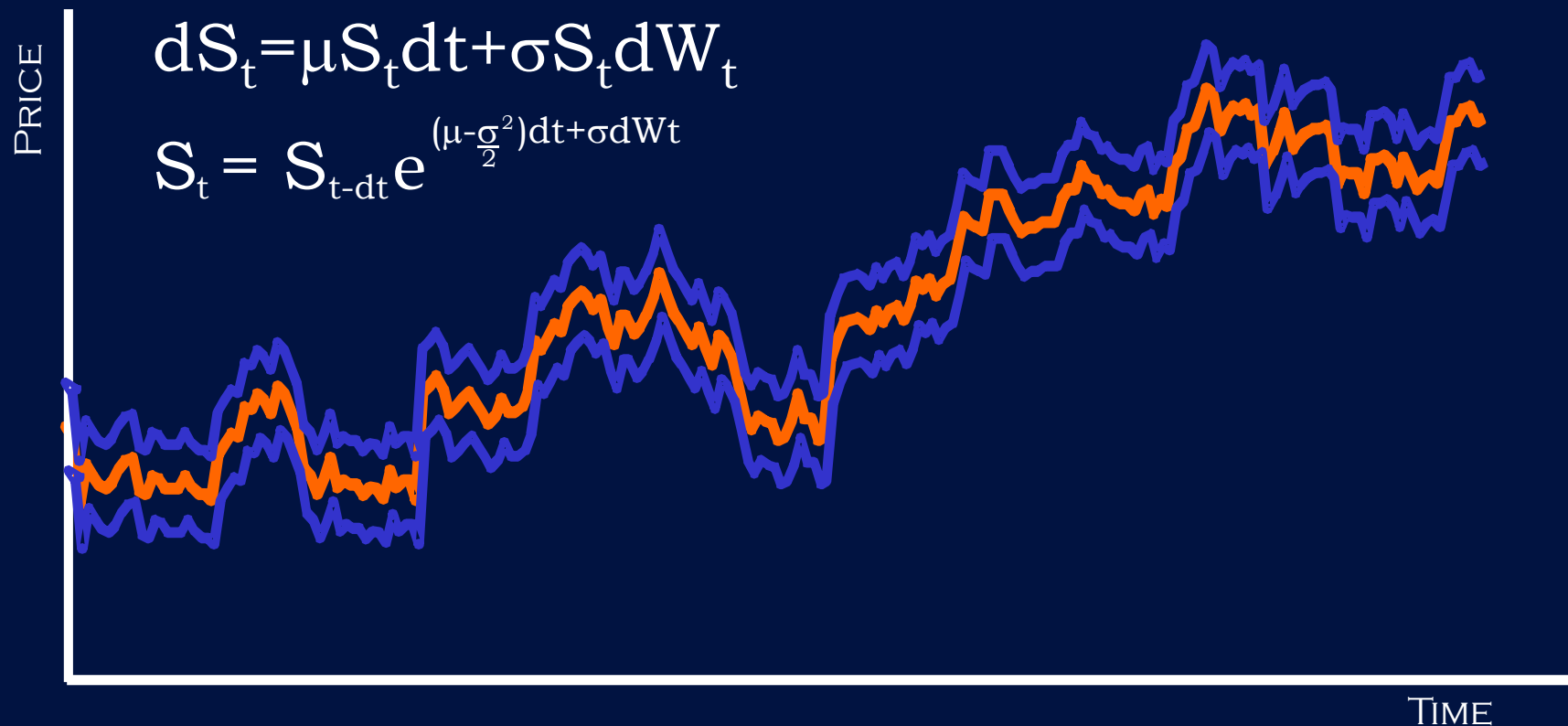
Θ = PERIOD AFTER THE DISCLOSURE OF THE
PREFERENTIAL INFORMATION

POTENTIAL PROBABILISTIC DISGORGEMENT

EACH INSIDER HAS HIS α



2.1) DEFINITION OF THE PROBABILISTIC MODEL



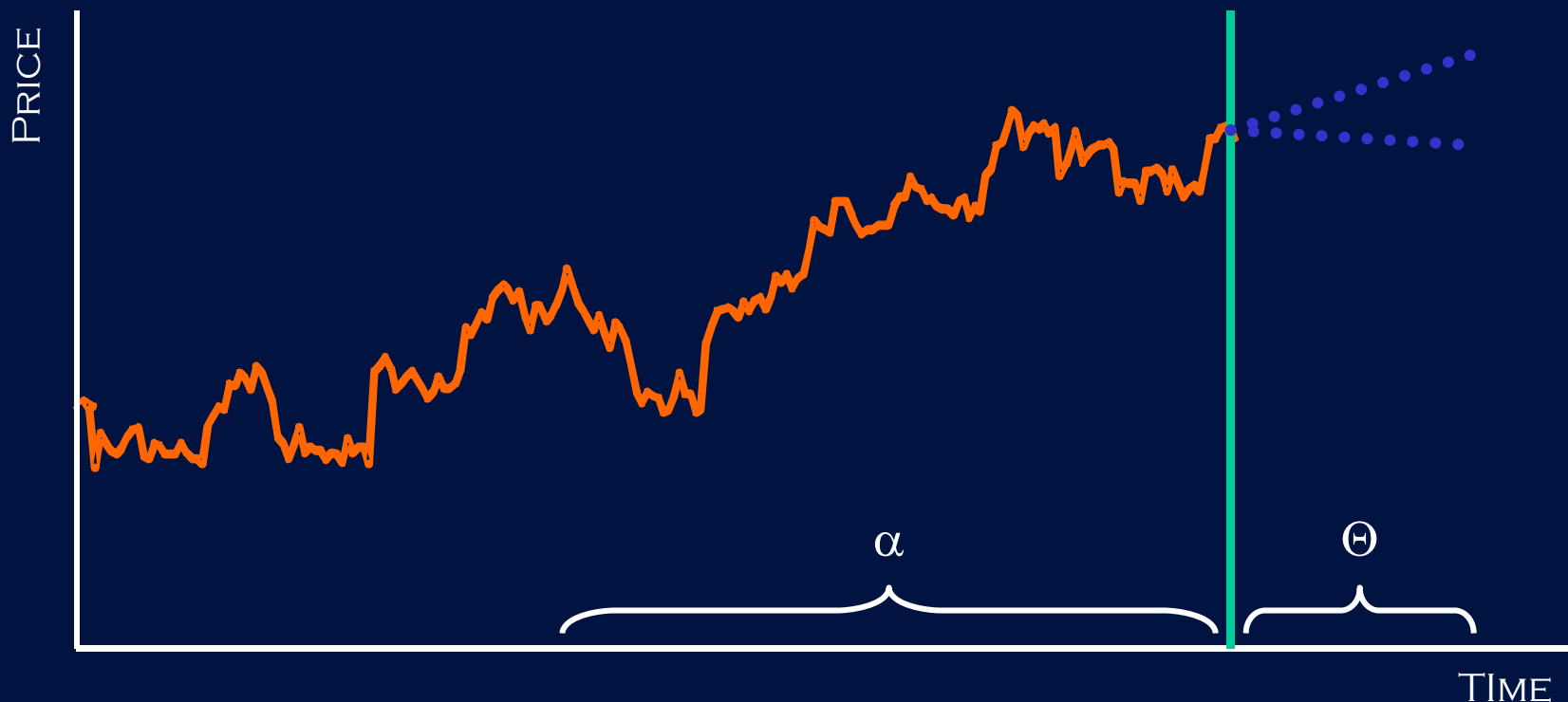
2.II) DEFINITION OF THE PROBABILISTIC MODEL IN PERIOD α

- A) SIMULATE THE TRADING STRATEGY OF THE SUSPECTED INSIDER
- B) IDENTIFY THE STOCK PRICE TREND THAT THE INSIDER INCORPORATES IN HIS POSITION
- C) DEFINE THE STOCK PRICE TREND WITHOUT THE PRICE SENSITIVE INFORMATION

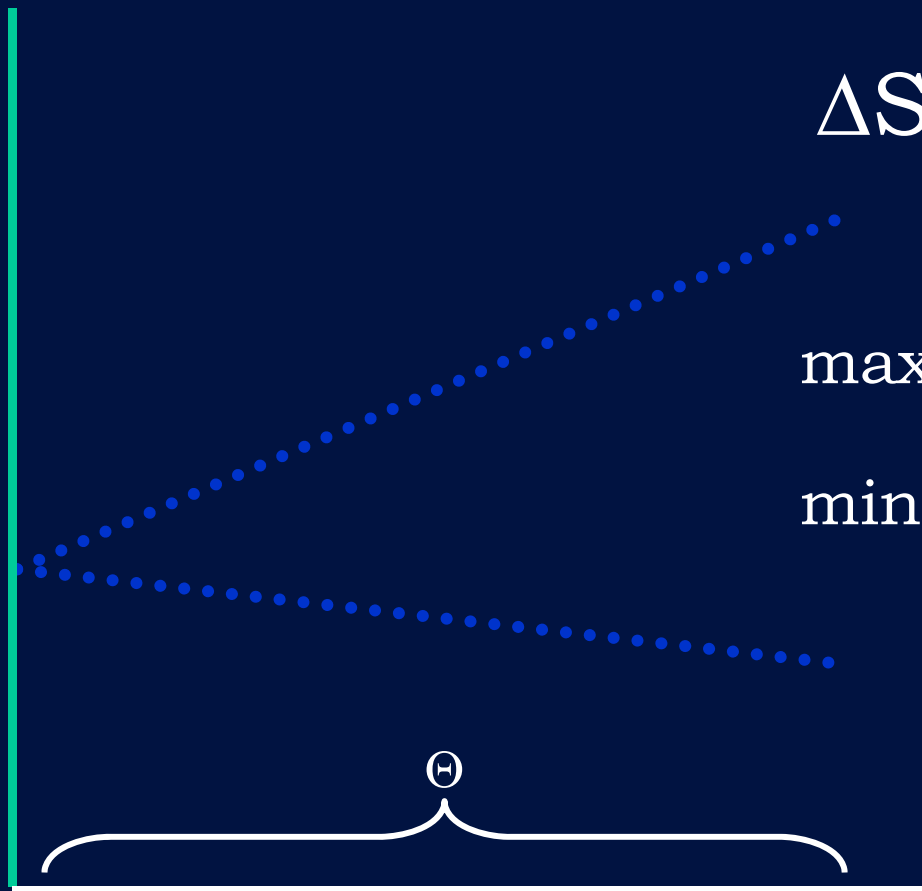
3.1) DEFINITION OF A PRICE FLUCTUATION

BAND IN PERIOD Θ

DESCRIBE THE STOCK PRICE TREND WITHOUT THE INFORMATION



3.1) PRICE FLUCTUATION BAND IN PERIOD Θ

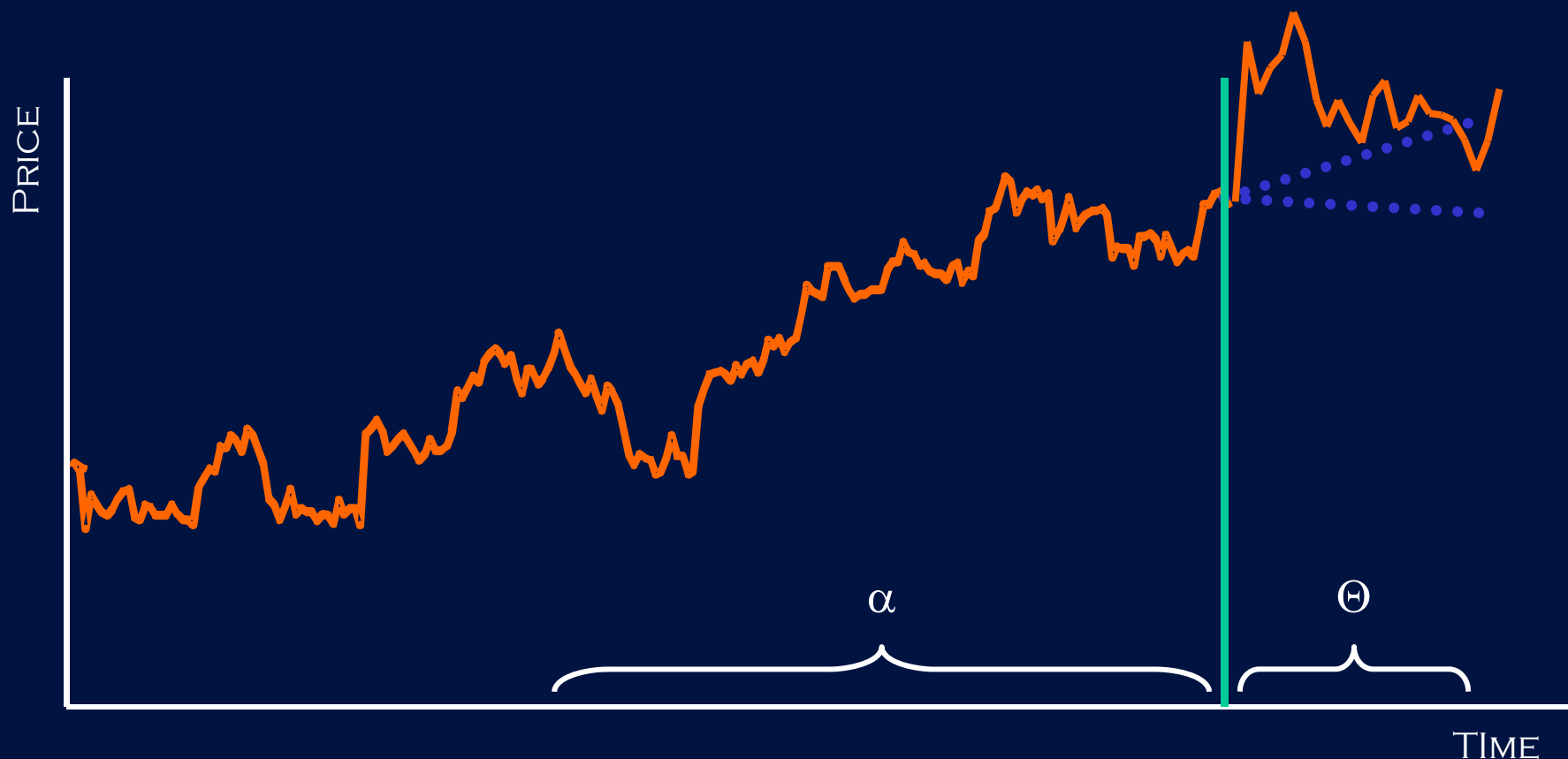


$$\Delta S_t^\Theta = [S_0^\Theta e^{\max}, S_0^\Theta e^{\min}]$$

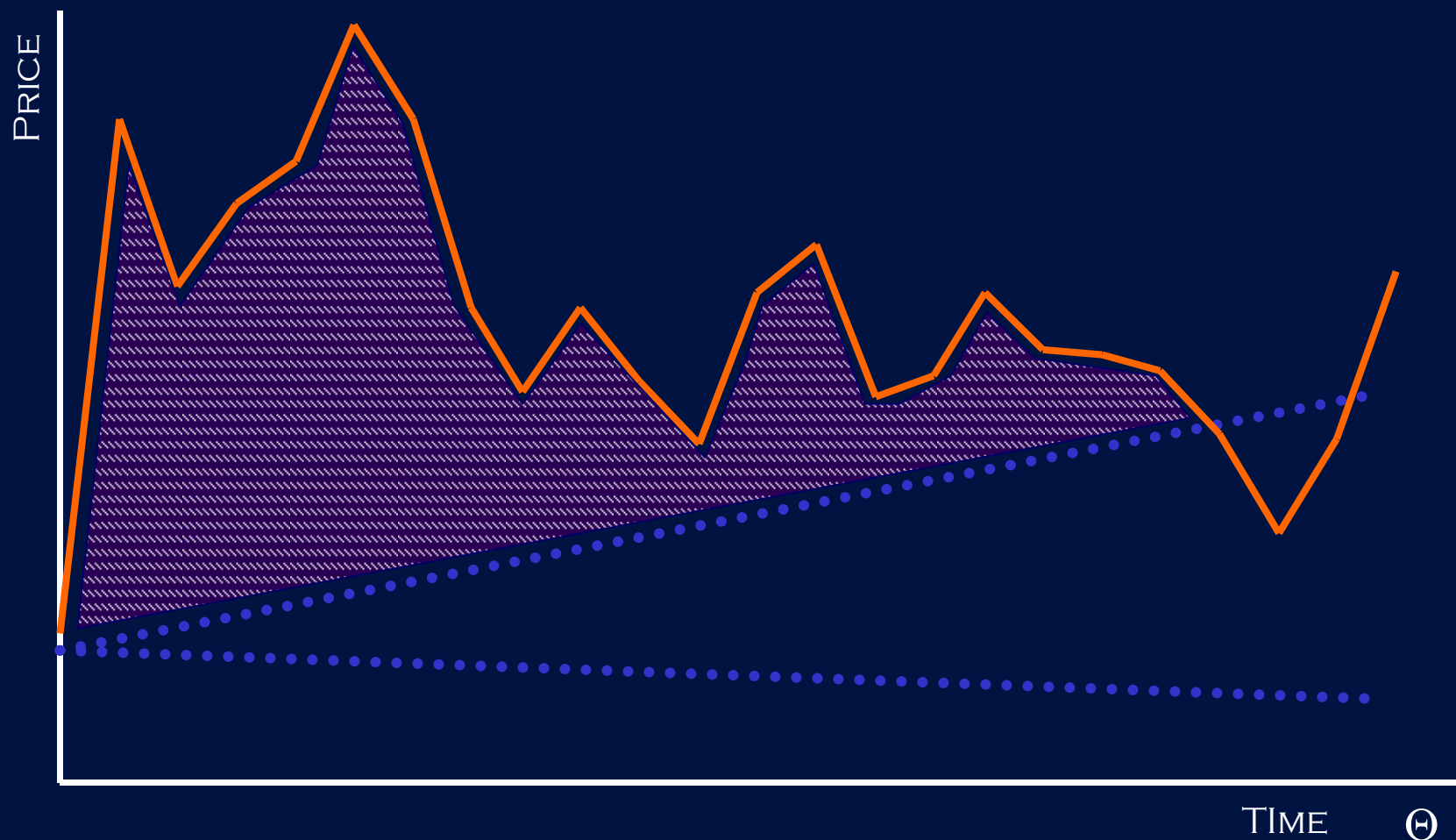
$$\max = \sigma z_{\frac{\Theta}{2}} \bar{x}_t + (\mu - \frac{\sigma^2}{2})t$$

$$\min = \sigma (-z_{\frac{\Theta}{2}}) \bar{x}_t + (\mu - \frac{\sigma^2}{2})t$$

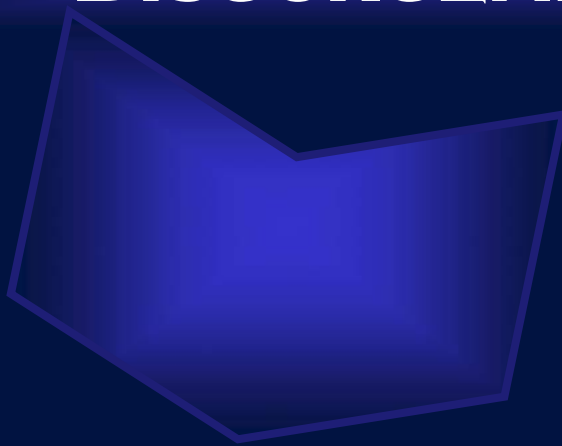
3.ii) STOCK PRICE AFTER THE DISCLOSURE OF THE PREFERENTIAL INFORMATION



4) DISGORGEMENT COMPUTATION



PROBABILISTIC METHOD FOR THE DISGORGEMENT COMPUTATION



ADVANTAGES



CONSIDERATIONS

ADVANTAGES

1. APPLICABILITY TO ALL INSIDER TRADING INVESTIGATION CASES:

- **IT IS NOT AFFECTED BY THE STOCK LIQUIDITY**
- **IT IS NOT INFLUENCED BY THE DISCONTINUITY OF THE TIME SERIES**
- **IT IS NOT INFLUENCED BY THE LACK OF THE TIME SERIES (EX. RECENT QUOTATIONS)**

2. CUSTOMIZED COMPUTATION

- **ACCURACY**
- **DISTINCTION BETWEEN INSIDERS VS FOLLOWERS**

3. FORECAST JUST BASED ON THE STOCK PRICE

- **IT DOES NOT REQUIRE A MARKET INDEX REGRESSOR**

4. IMPLEMENTATION

- **STRAIGHT FORWARD PROCEDURE: IT WORKS DIRECTLY ON PRICE AND NOT ON RETURN**
- **OPERATIVE EFFICIENCY**

CONSIDERATIONS

- 1. THE STATISTICAL HYPOTHESIS ARE VERIFIED A PRIORI**
- 2. IT BENEFITS FROM THE MARKOV PROPERTY, THAT IS COHERENT WITH THE WEAK FORM OF MARKET EFFICIENCY**
- 3. TIME IS INCLUDED IN THE MODEL**
- 4. USE OF A DAILY ABNORMAL RETURN INSTEAD OF A CUMULATIVE ABNORMAL RETURN ON Θ**

COMPARISON OF DIFFERENT METHODOLOGIES

EMPIRICAL CASE

**INSIDER TRADING INVESTIGATION RELATED
TO THE CONVERSION OF PREFERENTIAL
SHARES INTO ORDINARY ONES**

**ANALYSIS OF 2 DIFFERENT INSIDER
DISGORGEMENTS**

PRICE SENSITIVE EVENT:

**BOARD DECISION OF CONVERTING THE
PREFERENTIAL SHARES INTO ORDINARY
ONES WITH AN ADJUSTMENT OF 1 €**

QUANTITATIVE INFORMATION

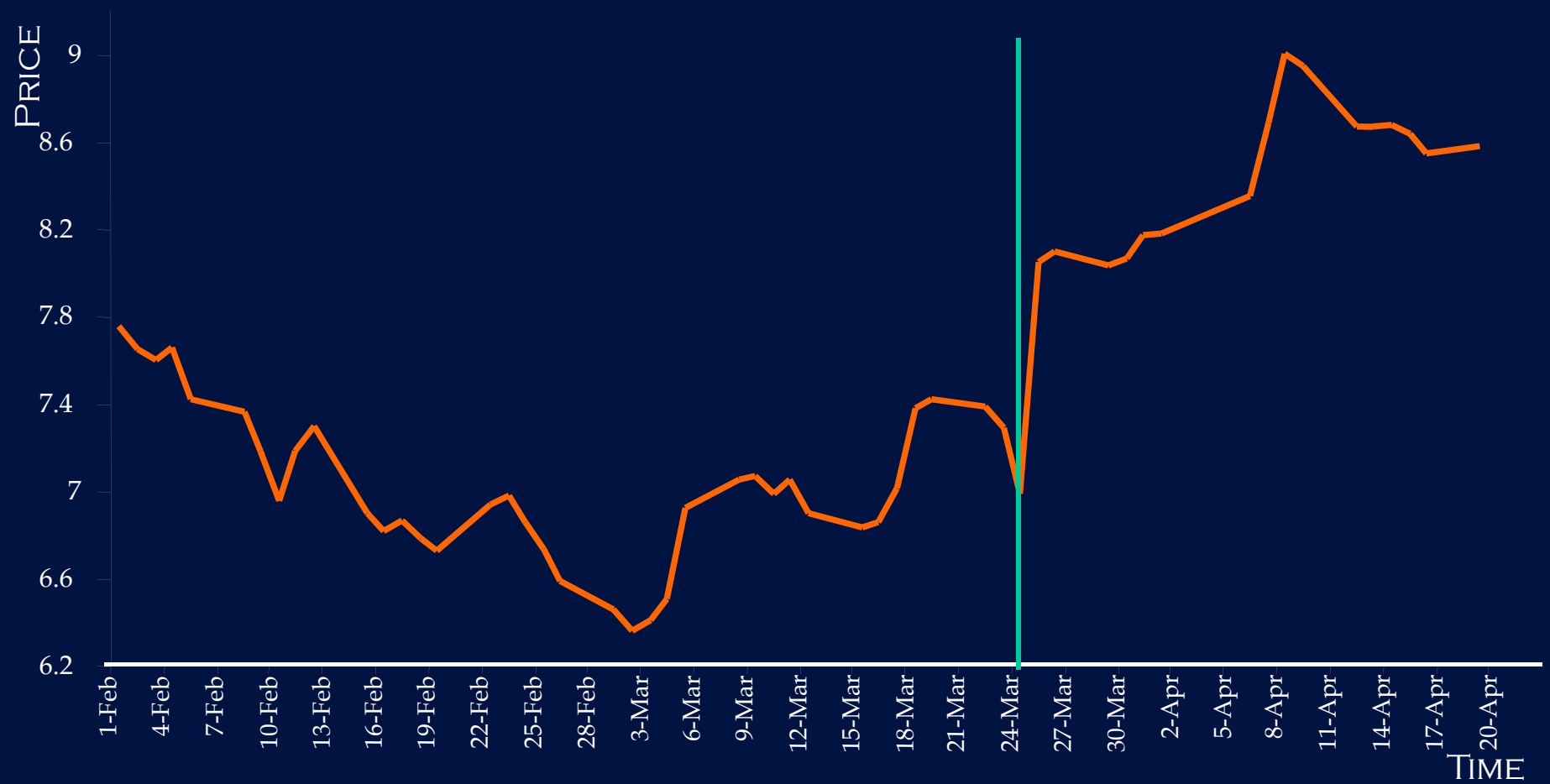
BEFORE THE DISCLOSURE OF THE INFORMATION:

$$\text{ORD. SHARE PRICE} - \text{PREF. SHARE PRICE} = 2.5 \text{ €}$$

AFTER THE DISCLOSURE OF THE INFORMATION:

$$\text{ORD. SHARE PRICE} - \text{PREF. SHARE PRICE} = 1.1 \text{ €}$$

STOCK PRICE TREND



ACTUAL DISGORGEMENT

1ST INSIDER 479.000 €

2ND INSIDER 124.000 €

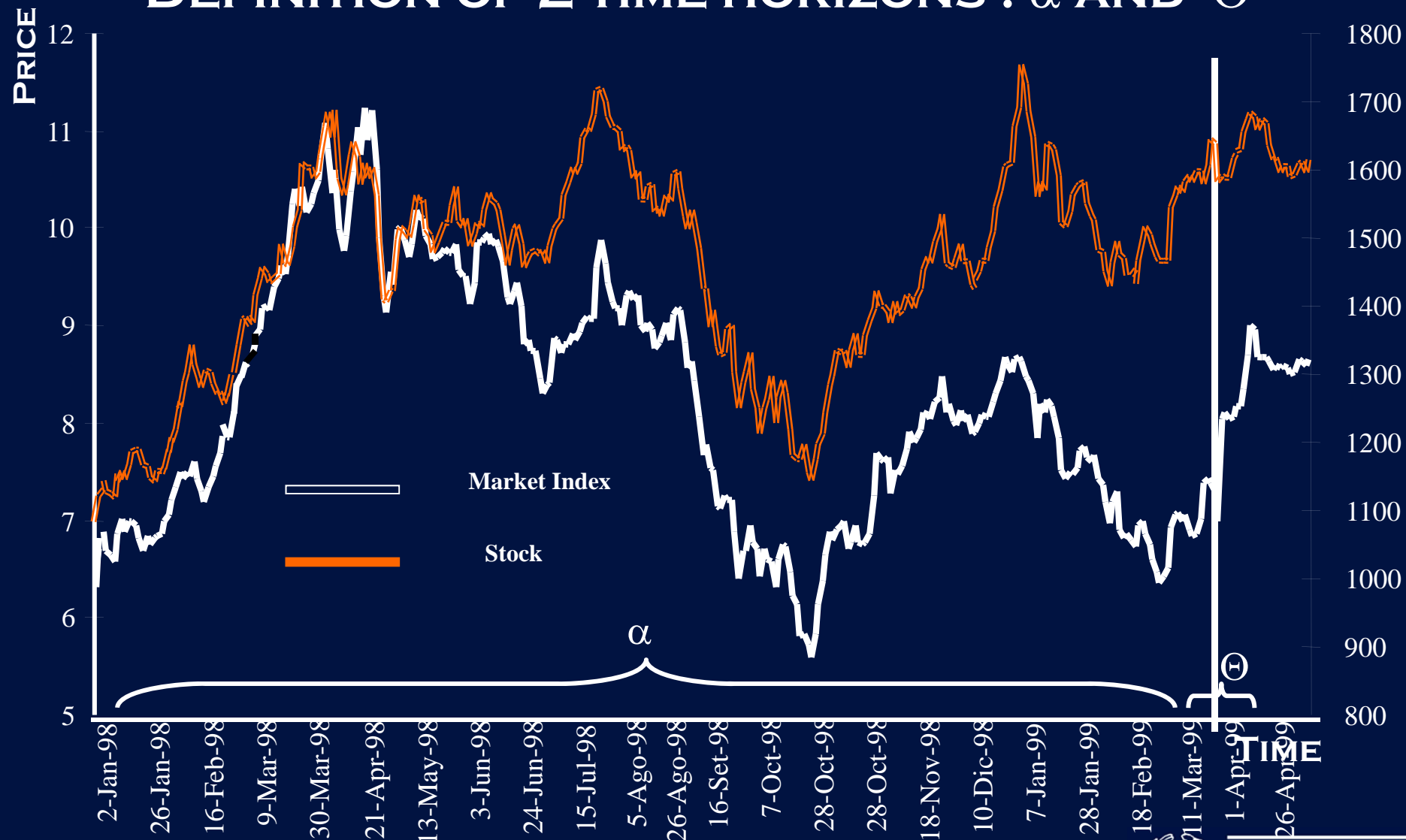
PROBLEMS

I CASE: PURCHASES AND SALES FAR FROM THE DISCLOSURE OF THE INFORMATION

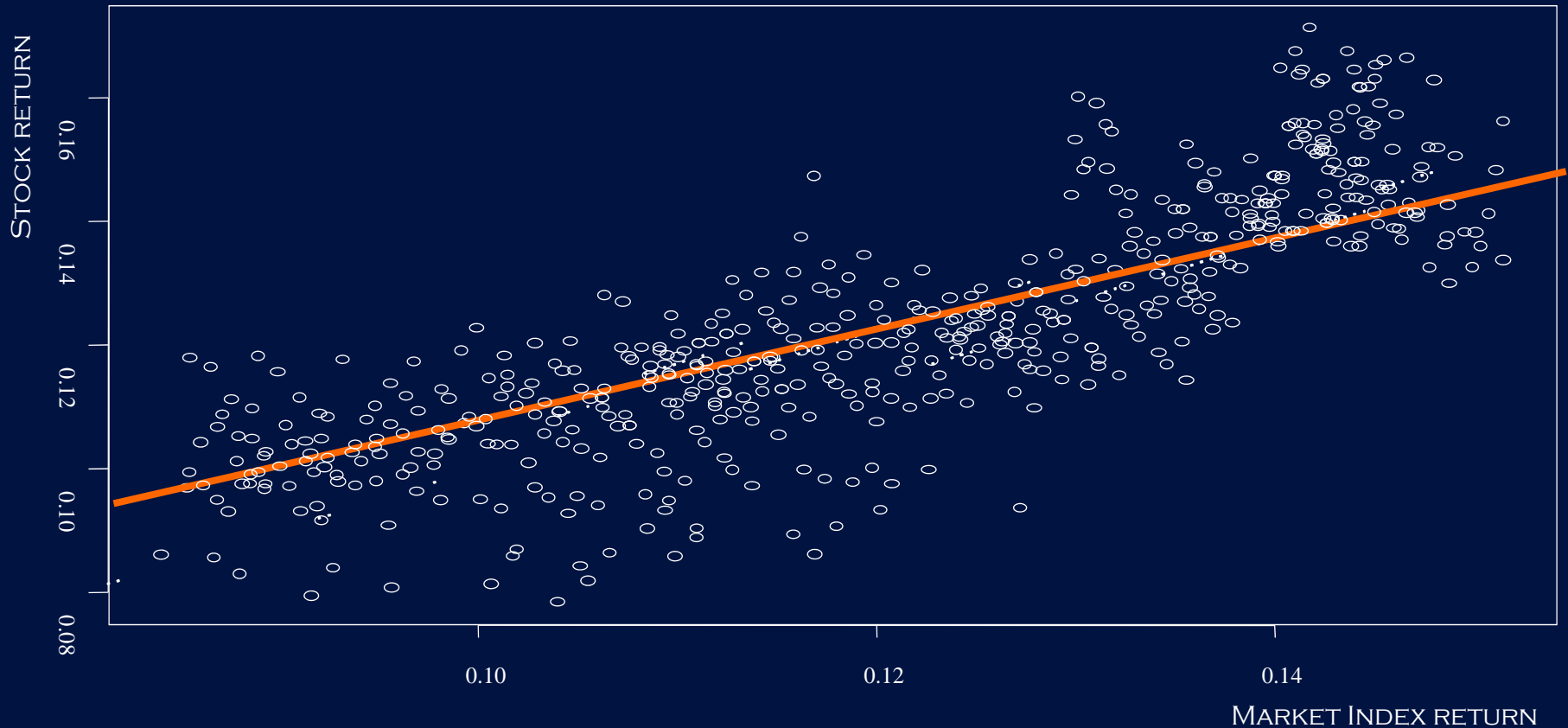
II CASE: PARTIAL SALES BEFORE THE DISCLOSURE OF THE INFORMATION

CASE STUDY: POTENTIAL ECONOMETRIC DISGORGEMENT

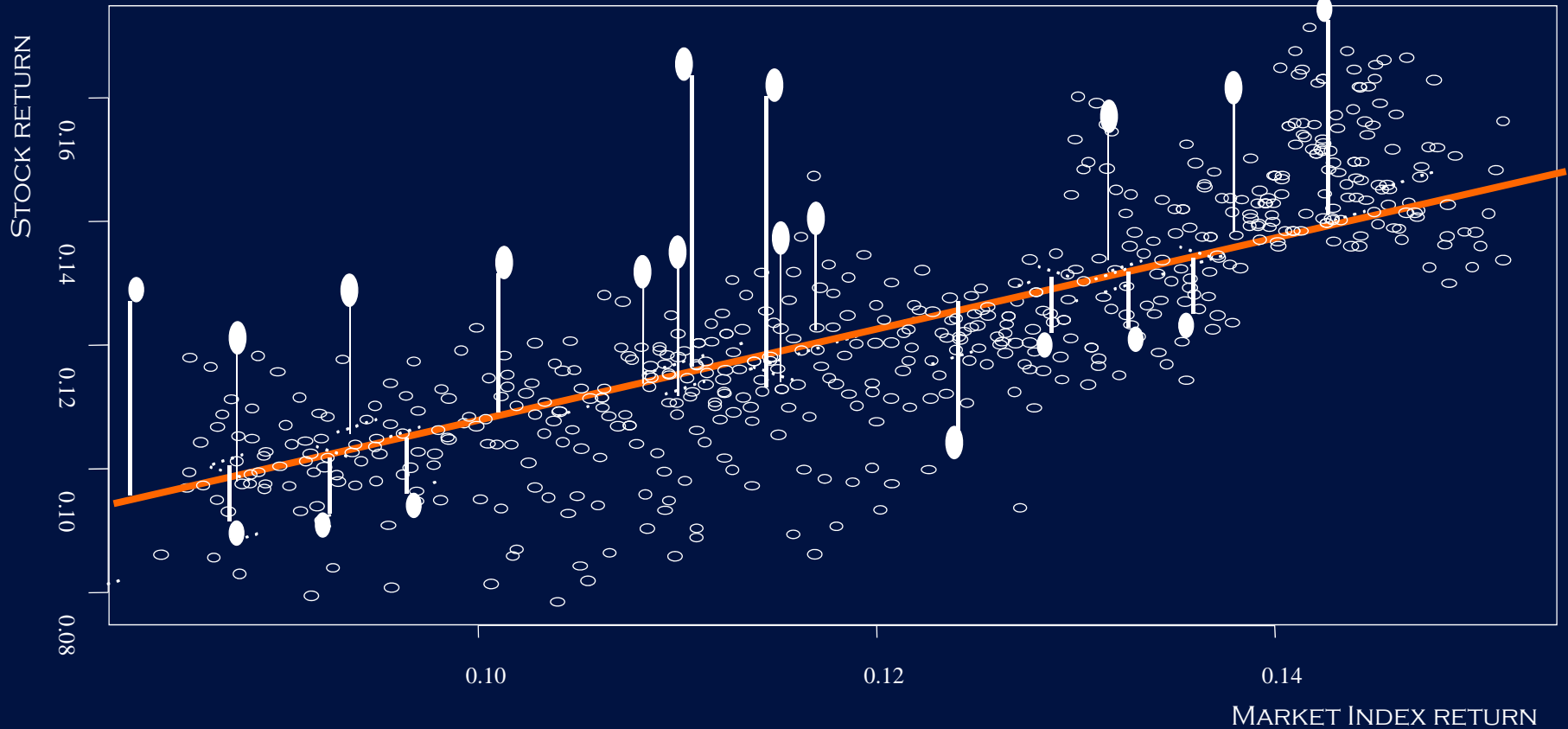
DEFINITION OF 2 TIME HORIZONS : α AND Θ



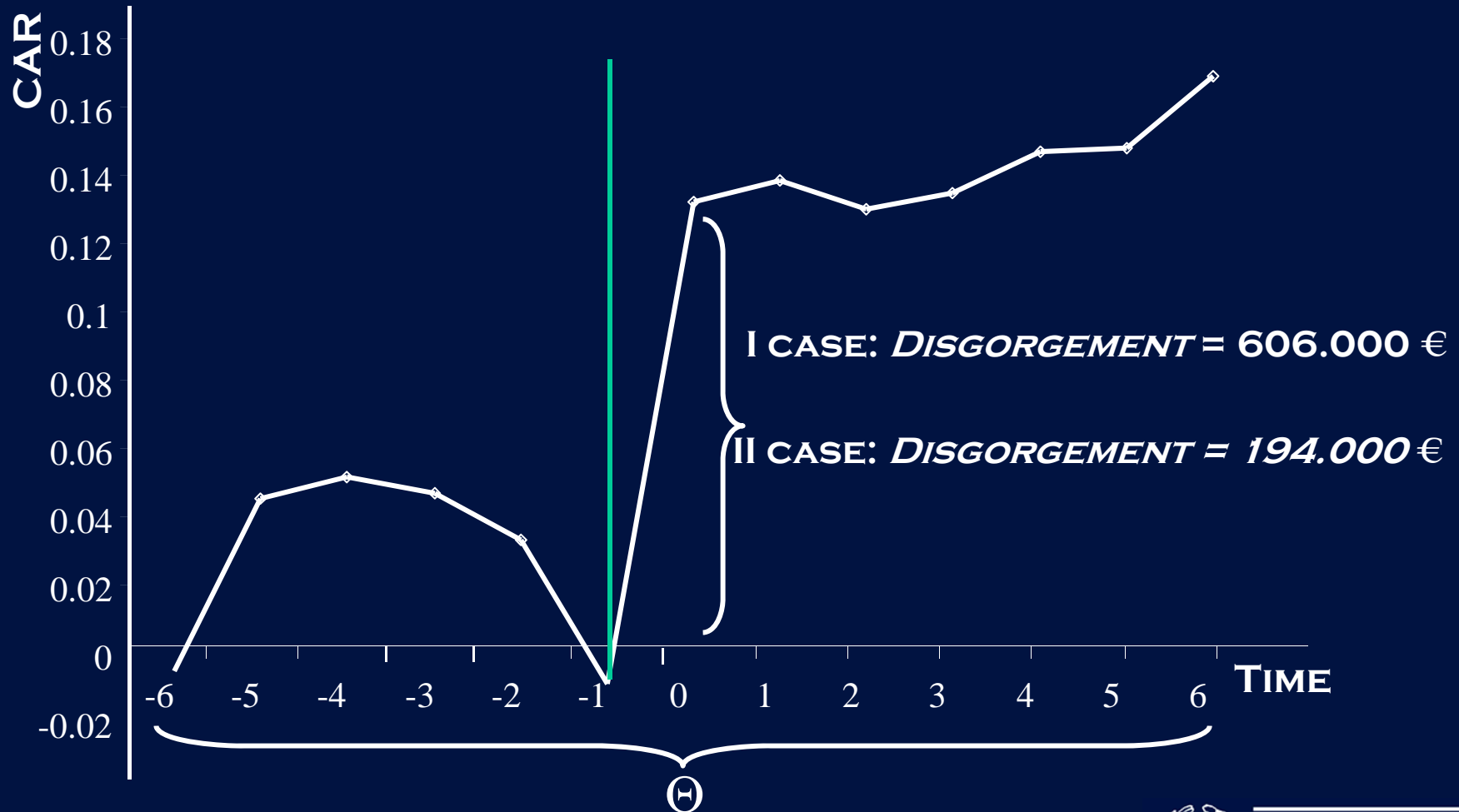
STOCK AND MARKET INDEX RETURN ANALYSIS IN TIME PERIOD α



ABNORMAL RETURN

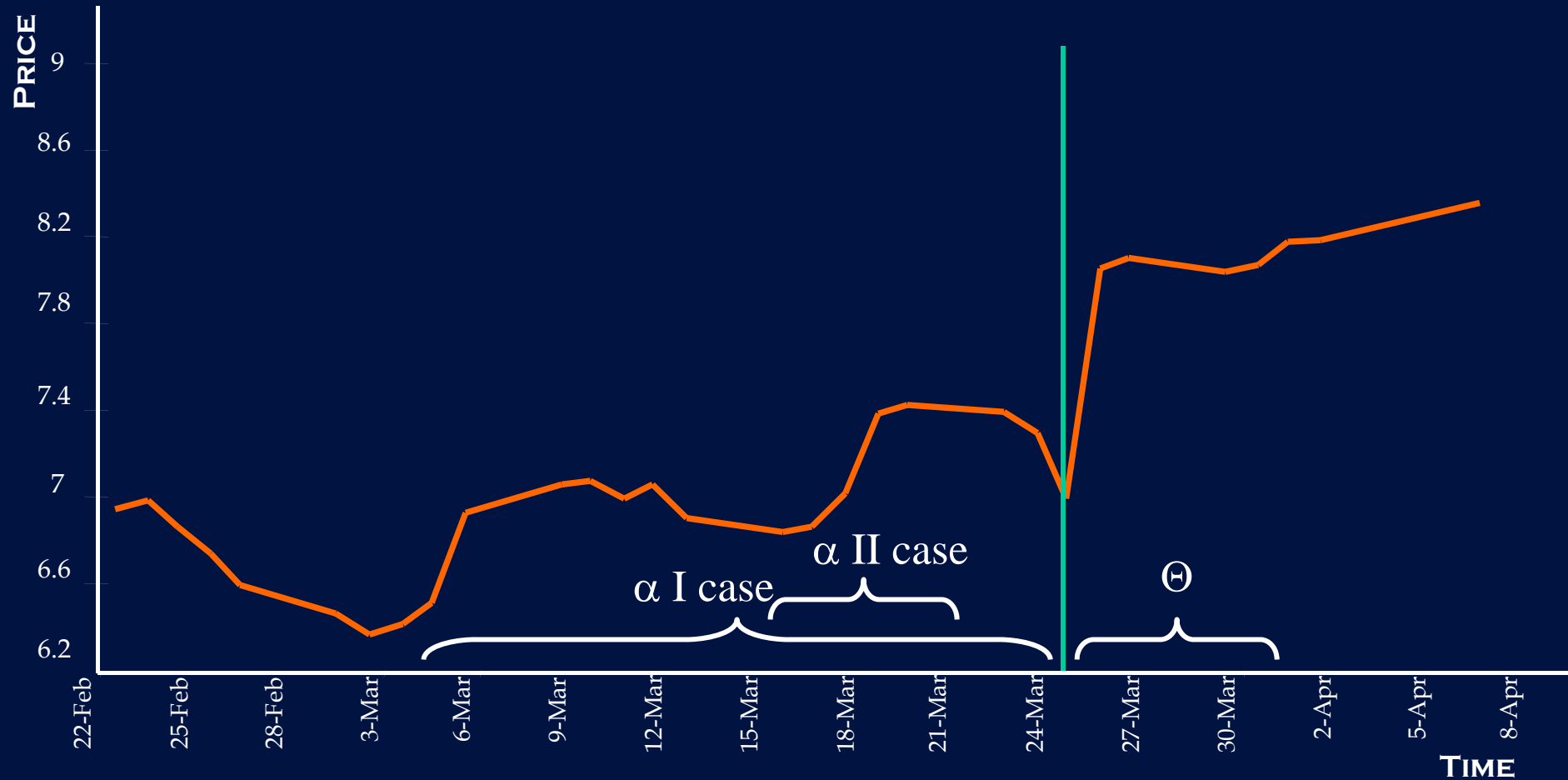


CUMULATIVE ABNORMAL RETURN

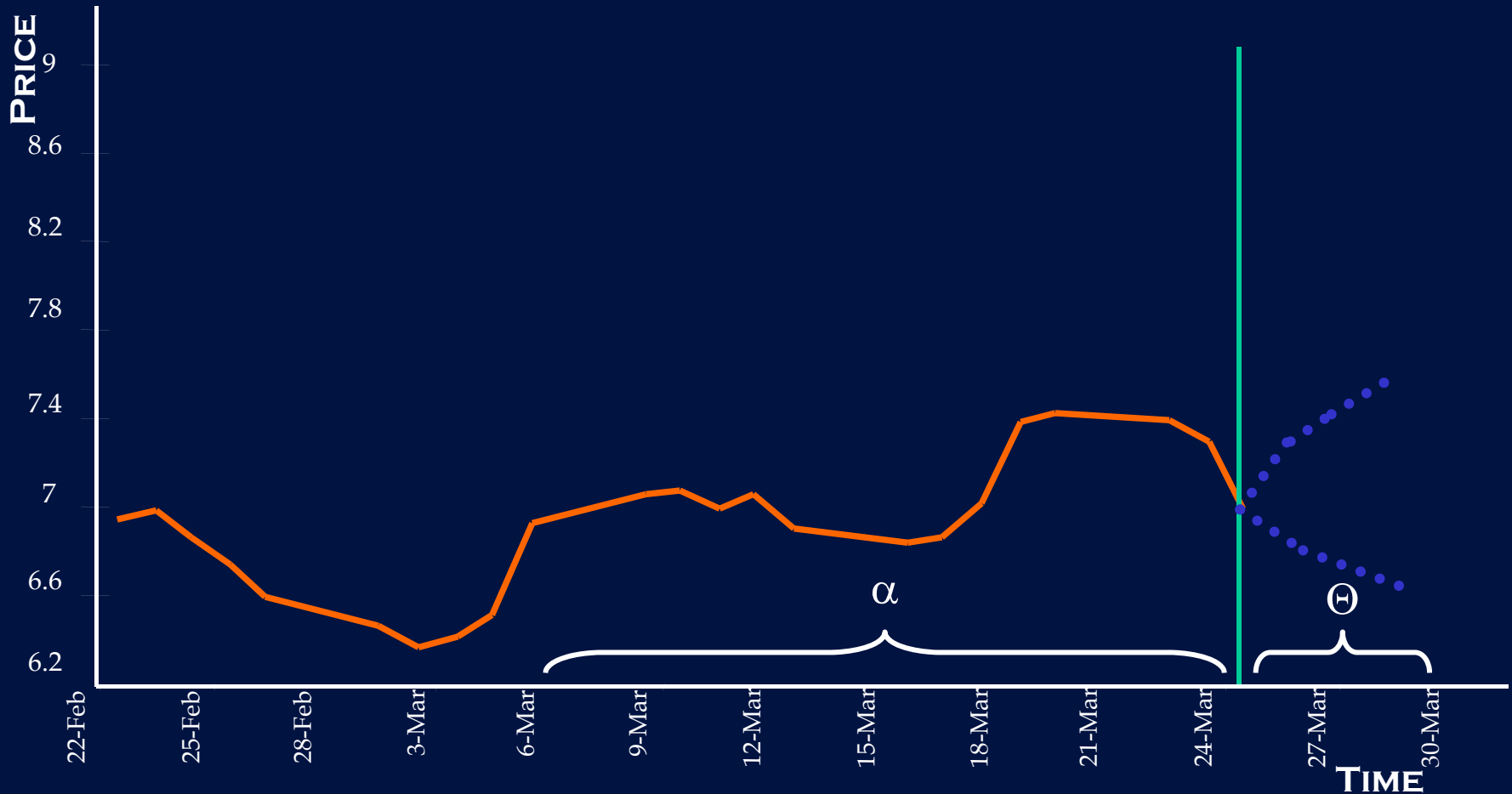


CASE STUDY: POTENTIAL PROBABILISTIC DISGORGEMENT

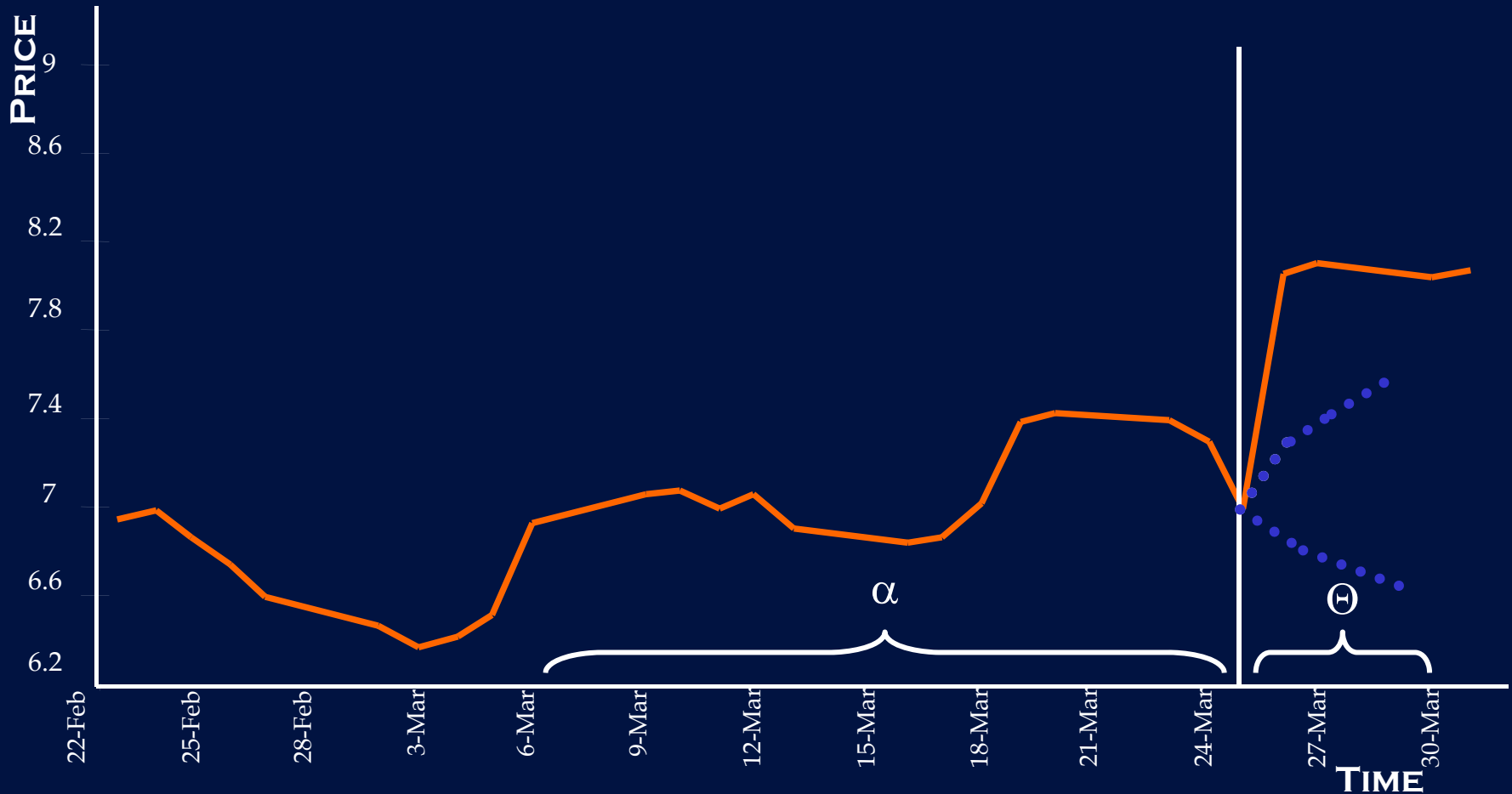
DEFINITION OF 2 TIME HORIZONS : α AND Θ



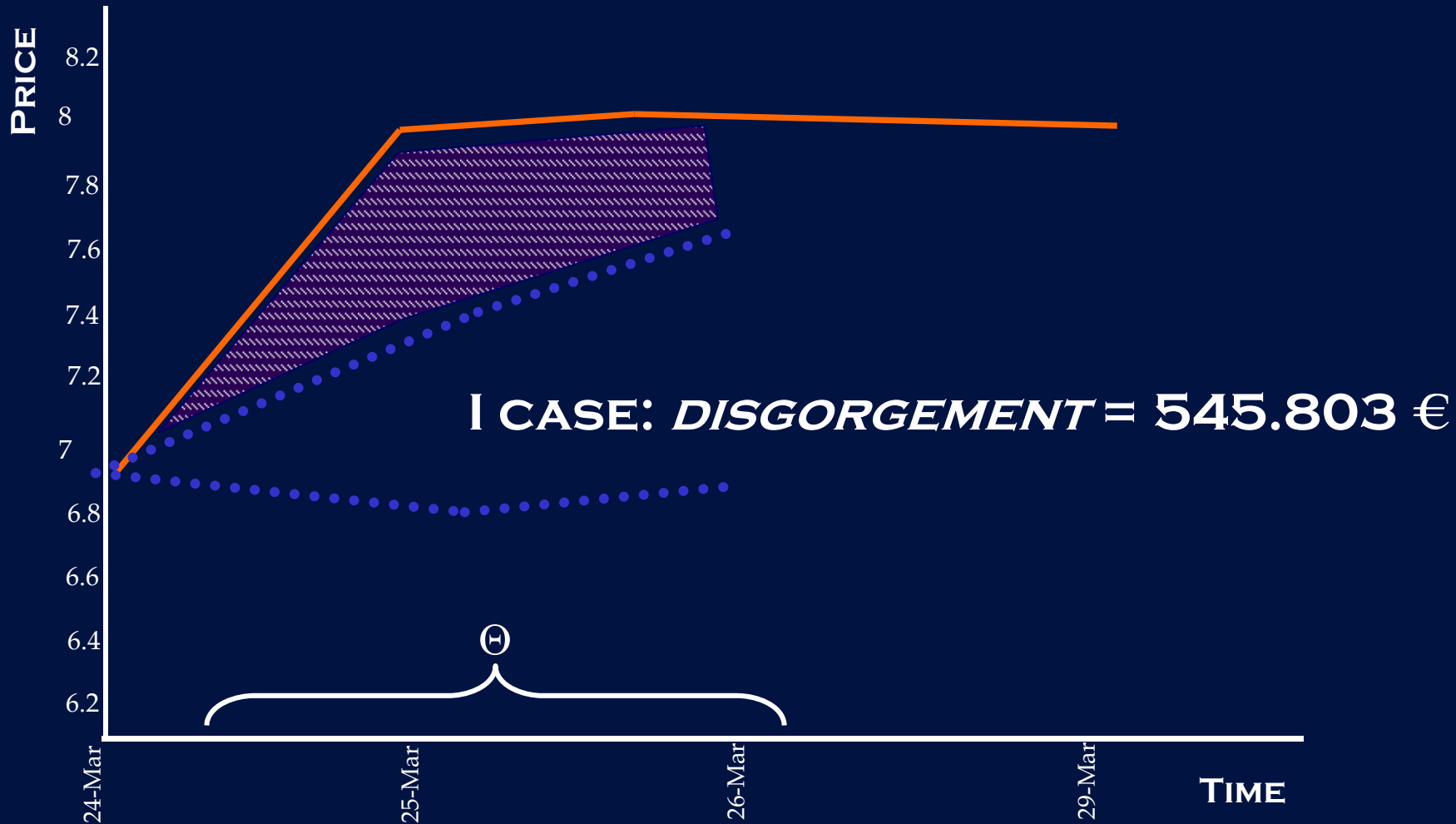
I CASE: DETERMINATION OF THE BAND



I CASE: COMPARISON TO MARKET PRICE



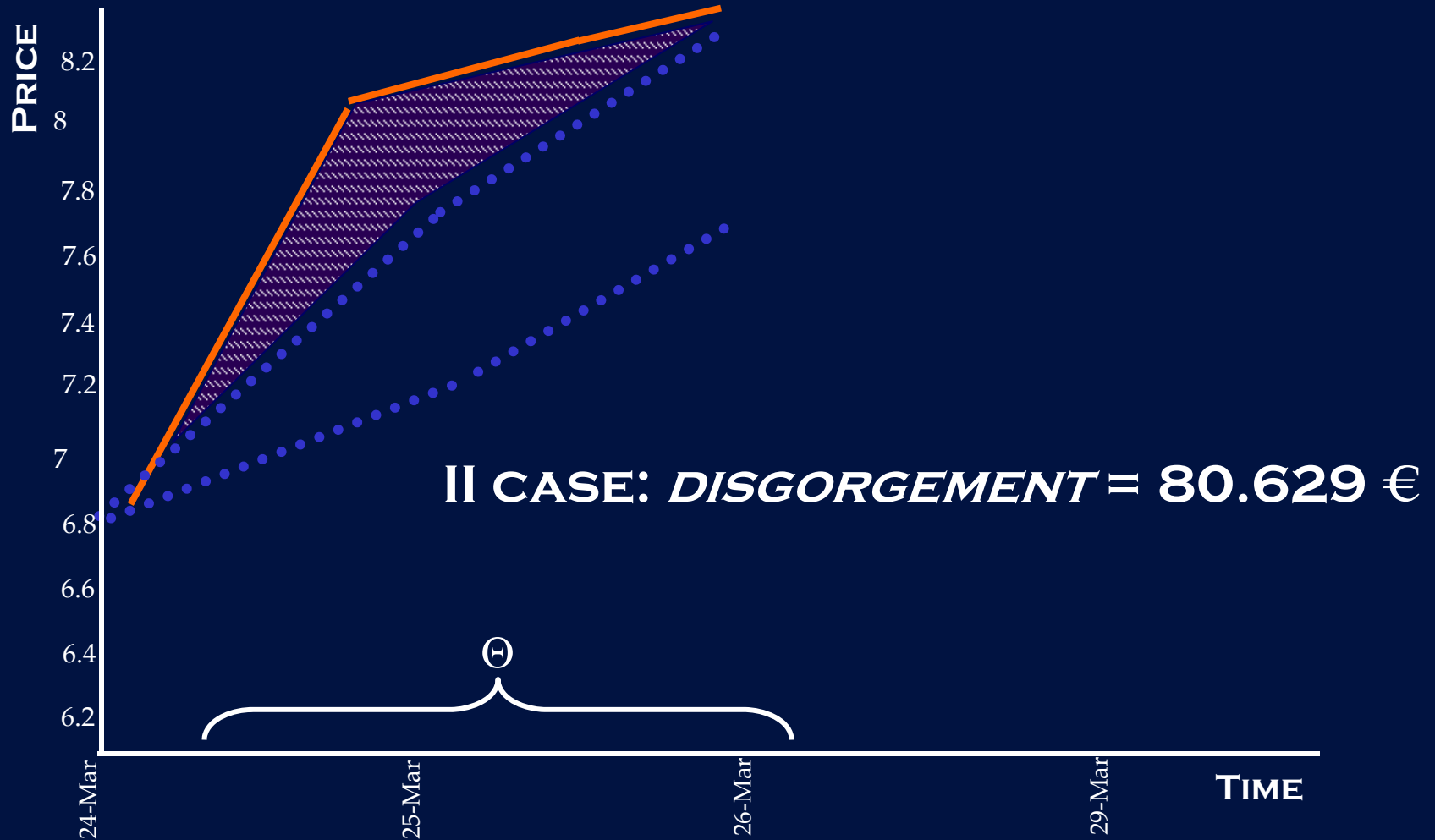
I CASE: *DISGORGEMENT* COMPUTATION



II CASE: DETERMINATION OF THE BAND COMPARISON WITH MARKET PRICE



II CASE: *DISGORGEMENT* COMPUTATION



DISGORGEMENT COMPUTATION: EMPIRICAL CASE

COMPARISON OF THE THREE METHODOLOGIES

	<u>ACTUAL</u>	<u>ECONOMETRIC</u>	<u>PROBABILISTIC</u>
I CASE	479.000 €	606.000 €	545.803 €
II CASE	124.000 €	194.000 €	80.629 €

A SUPERVISORY PERSPECTIVE ON INSIDER TRADING

ESTIMATING THE VALUE OF THE INFORMATION

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16TH NOVEMBER 2000