# Study Plan

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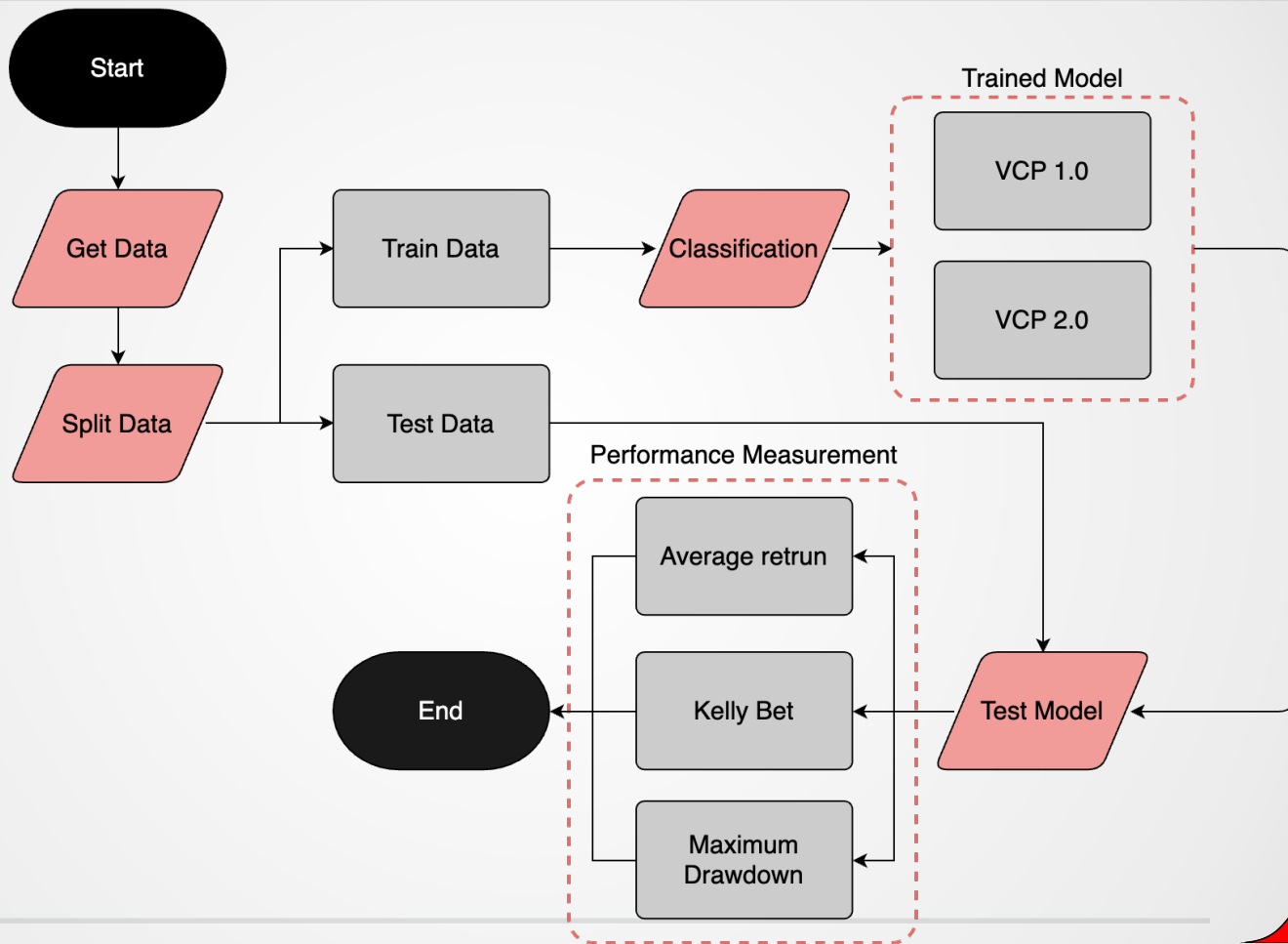Email: pinyu0105.mg12@nycu.edu.tw

# Outline

1. Flow chart
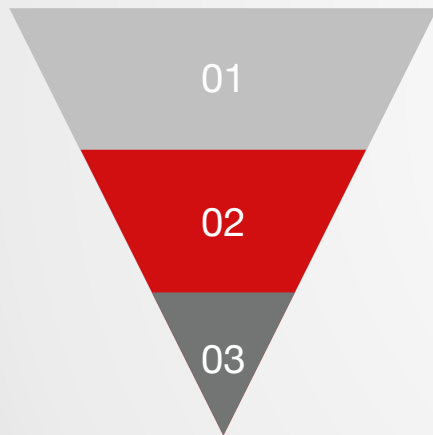
2. Topic Review

3. Study Plan

# Flow chart

# Catch a Volatility Contraction Pattern (VCP) Breakout in Taiwan Market

**Objective:**
Capture stocks with strong upward momentum in a short period.

01      Filter 1: Stage 2

02      **Filter 2: VCP**
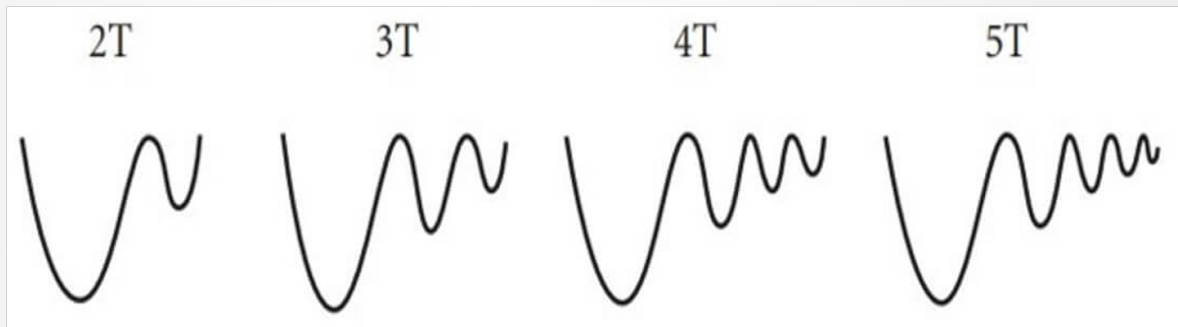
03      Filter3: Strong fundamental support

# VCP

The development of the VCP pattern includes:

⊡ Decreased trading volume

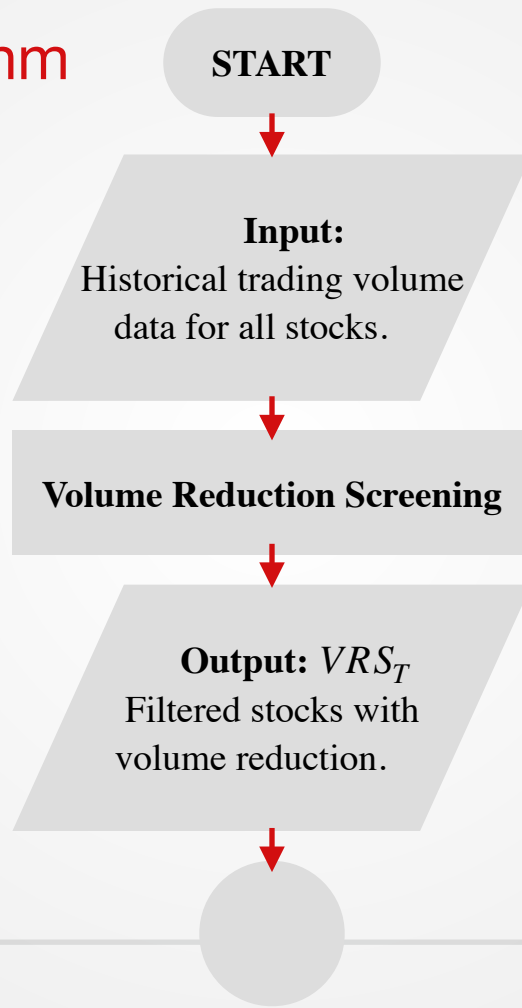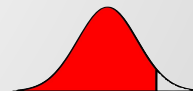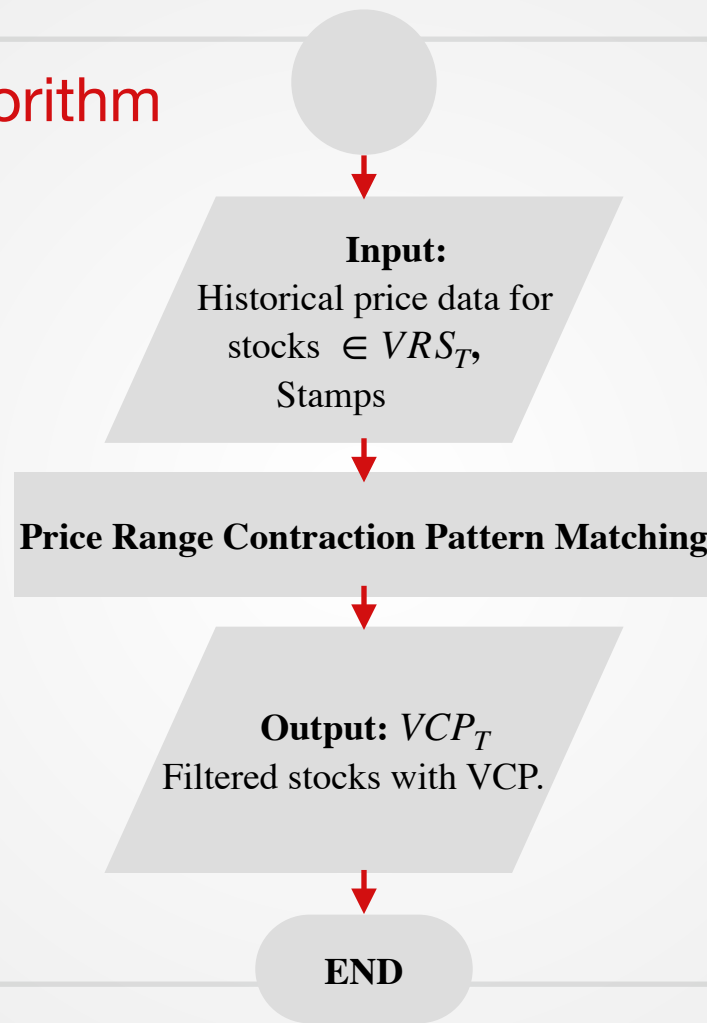⊡ **Price range contraction**

Examples



Source:
Minervini, M. (2013). Trade Like a Stock Market Wizard: How to Achieve Super Performance in Stocks in Any Market. McGraw-Hill Education.

# Flow chart of Algorithm

**START**

**Input:**
Historical trading volume
data for all stocks.

**Volume Reduction Screening**

**Output:** $VRS_T$
Filtered stocks with
volume reduction.

# Flow chart of Algorithm

**Input:**
Historical price data for
stocks $\in VRS_T$,
Stamps

**Price Range Contraction Pattern Matching**

**Output:** $VCP_T$
Filtered stocks with VCP.

**END**

# Research Design

Algorithm :VCP Trading Strategy

Step1 :Volume Reduction Screening

1. For each stock $j$ in the market at time $T$:

   • Calculate volume moving averages:

$$V_j^{10ma} = \frac{1}{10} \sum_{t=T-9}^{T} V_{j,t}$$

$$V_j^{60ma} = \frac{1}{60} \sum_{t=T-59}^{T} V_{j,t}$$

2. Let the set of stocks with volume reduction be denoted by:

$$VRS_T = \left\{ j \,|\, V_j^{10ma} < 0.5 V_j^{60ma} \right\}$$

# Research Design

<span style="background-color:#595959; color:white">Algorithm</span> :VCP Trading Strategy

<span style="background-color:#cc0000; color:white">Step2</span> : Price Range Contraction Pattern Matching

For each stock $j \in VRS_T$ at time $T$:

- Get historical prices $P_{t,j}$ for past t days

- Normalize prices and time to $\widetilde{P_{t,j}}$ using min-max scaling

- Calculate similarity score

$$\rho_j = \max \left( \cos \left( \widetilde{P_{t,j}}, stamp_k \right) \right), \forall k = 2,3,\ldots,10$$

# Research Design

Algorithm :VCP Trading Strategy

Step3 :Cross-sectional Ranking

- Sort all $\rho_j$ in descending order

- Select top 50 stocks with highest similarity score:

$$VCP_T = \left\{ j \mid rank\left(\rho_j\right) \leq 50 \right\}$$

# Research Design

Algorithm :VCP Trading Strategy

Step4 Daily Update

- Calculate new $VCP_{T+1}$ each day

- Track set changes:

  - Entry: $N = VCP_{T+1} \backslash VCP_T$ (new stocks)

  - Exit: $E = \left\{ j \mid r_j \geq (1 + \alpha) \vee r_j \leq (1 - \beta) \right\}$ (removed stocks)

  - Hold: $H = \left( VCP_{T+1} \cup VCP_T \right) \backslash E$ (maintained stocks)

# Appendix: Examples for Rescaling



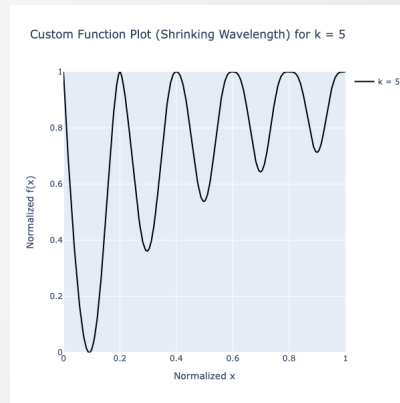$$P_{t,j} \quad\longrightarrow\quad \widetilde{P_{t,j}}$$
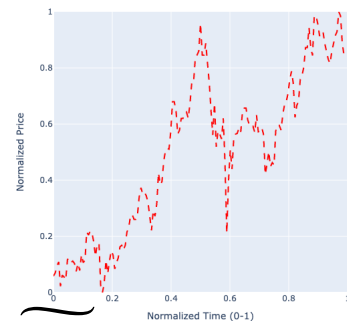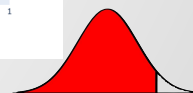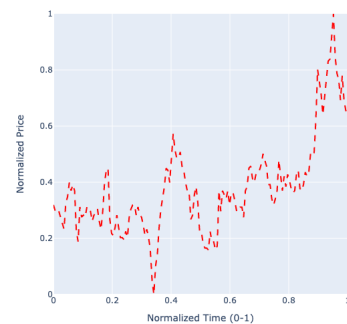
# Appendix: $Stamp_k, \forall k = 2,3,\ldots,10$

**Examples** $\quad f(x) = -\dfrac{\left(\cos^2(3\pi x)\right)^x}{x}, \ 0.5 < x < 0.5 + k \cdot \dfrac{1}{3}$

After normalized the function to $\widetilde{f(x)}$ using min-max scaling:
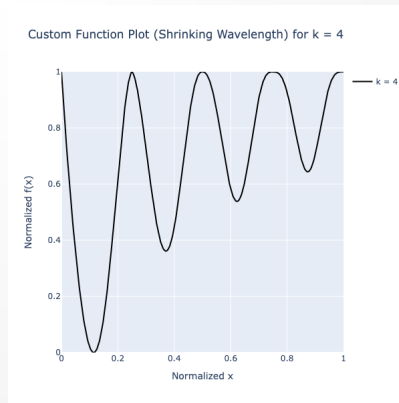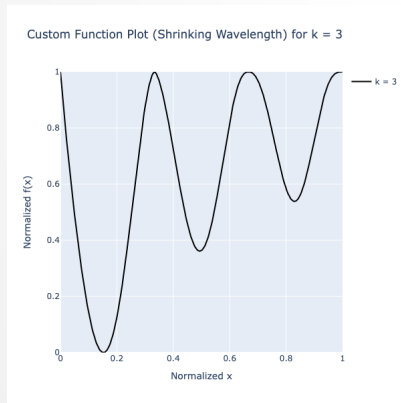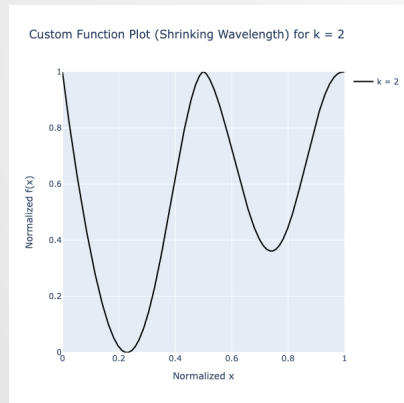
# Appendix: Cross-sectional Ranking

Examples    $\rho_j = \max \left( \cos \left( \widetilde{P_{t,j}}, stamp_k \right) \right), \forall k = 2,3,\ldots,10$

| | $\rho_j$ |
|---|---|
| $stock_1$ | 0.99 |
| $stock_2$ | 0.96 |
| . | . |
| . | . |
| . | . |
| $stock_n$ | 0.063 |

Rank =50

# Study Plan

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