Study Plan

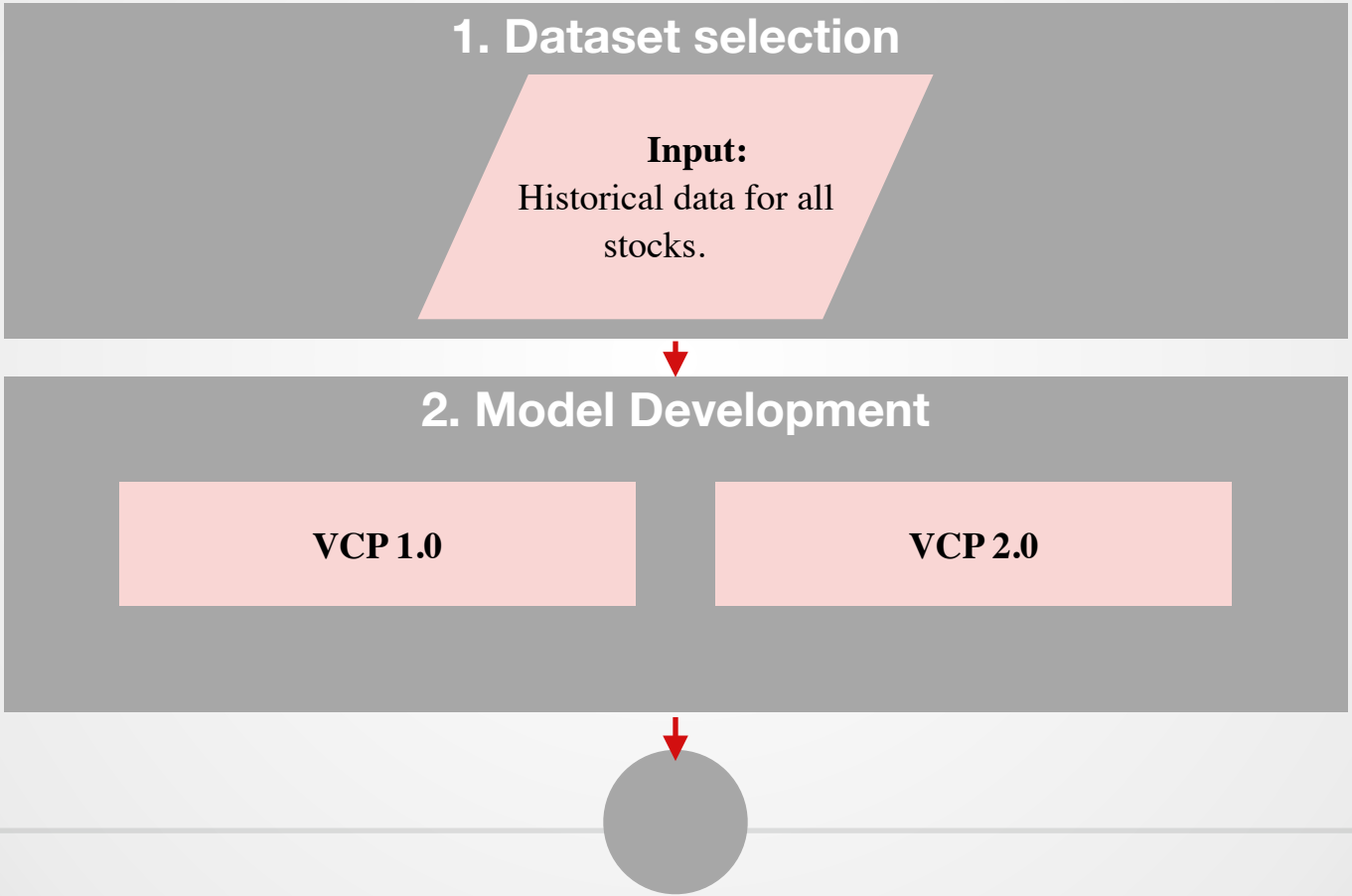
Pin Yu Chen (Alice)

Department of Information Management and Finance, National Yang Ming Chiao Tung University.
Email: pinyu0105.mg12@nycu.edu.tw

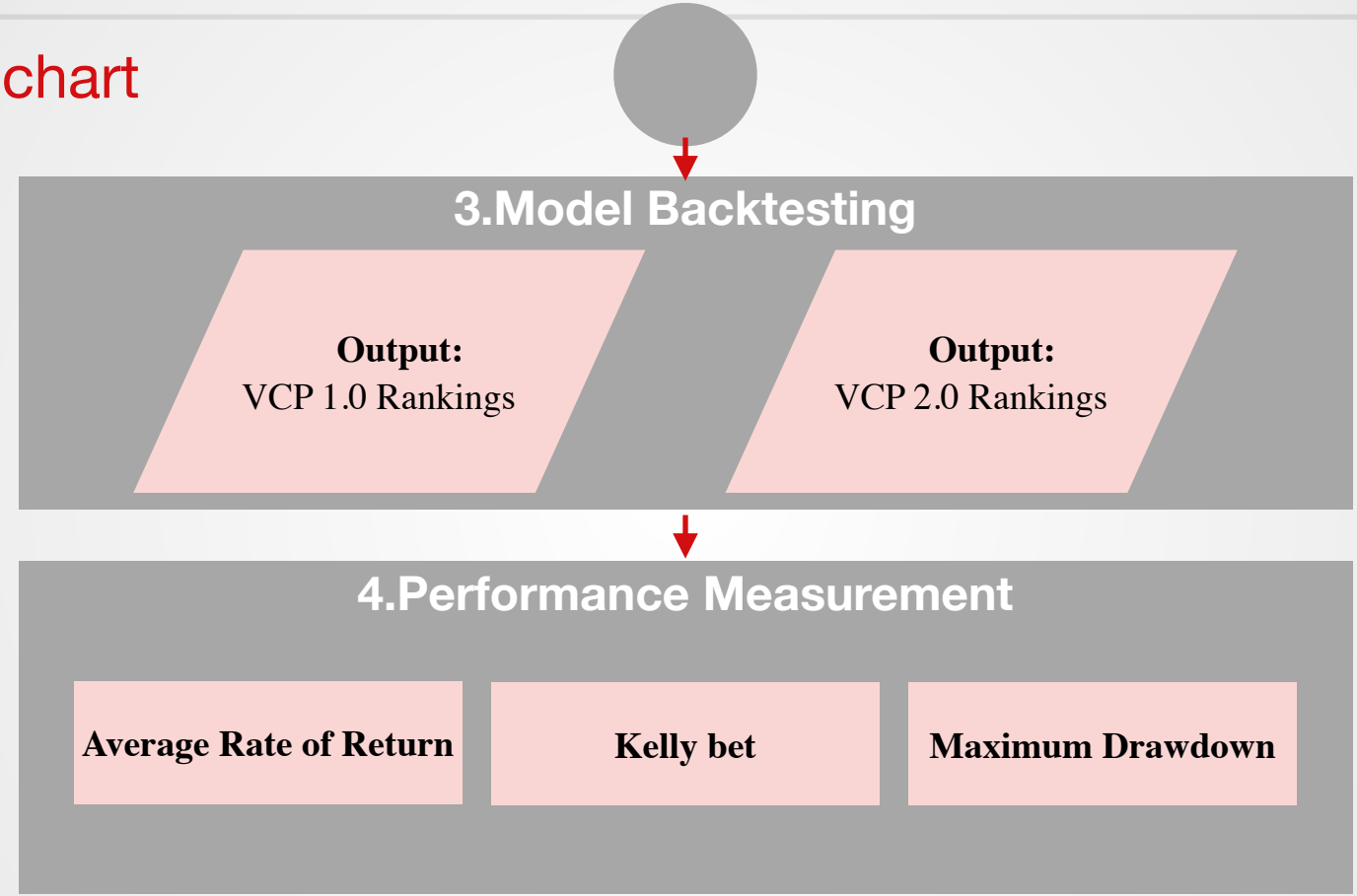
Outline

1. Flow chart
2. Topic Review
3. Study Plan

Flow chart

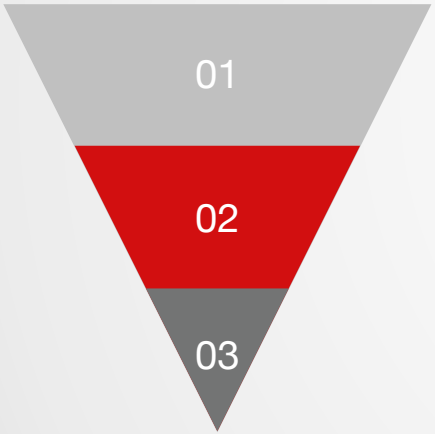

1. Dataset selection
Input:
Historical data for all stocks.
2. Model Development
VCP 1.0
VCP 2.0

Flow chart


3.Model Backtesting
Output:
VCP 1.0 Rankings
Output:
VCP 2.0 Rankings
4.Performance Measurement
Average Rate of Return
Kelly bet
Maximum Drawdown

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

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



Filter 1: Stage 2

Filter 2: VCP

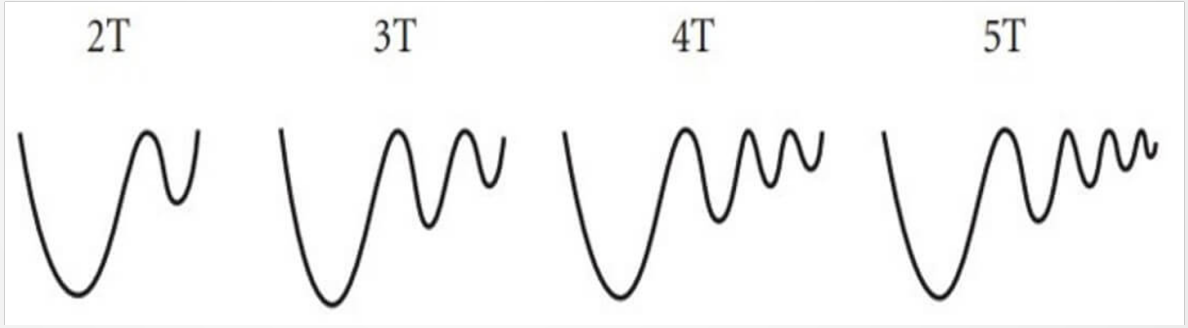
Filter3: Strong fundamental support

VCP

The development of the VCP pattern includes:

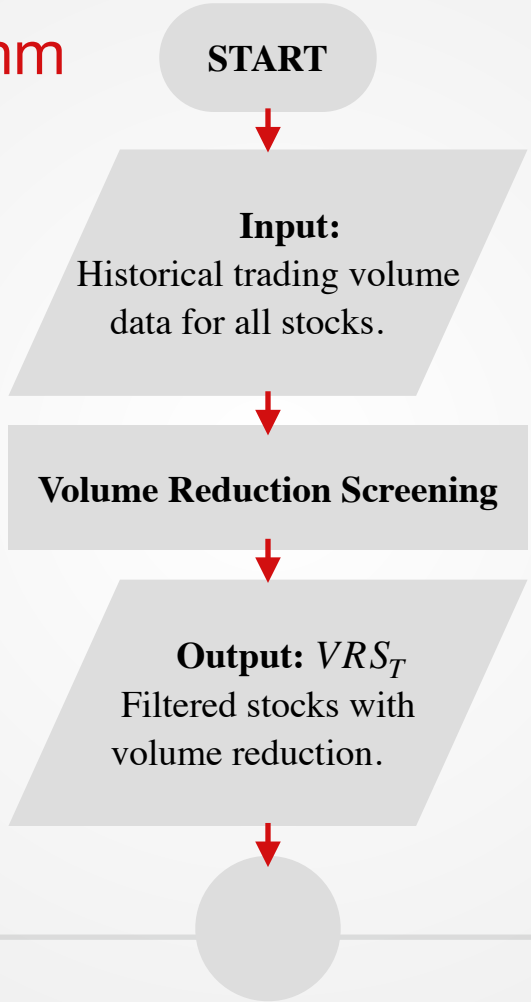
- Decreased trading volume
- **Price range contraction**

Examples

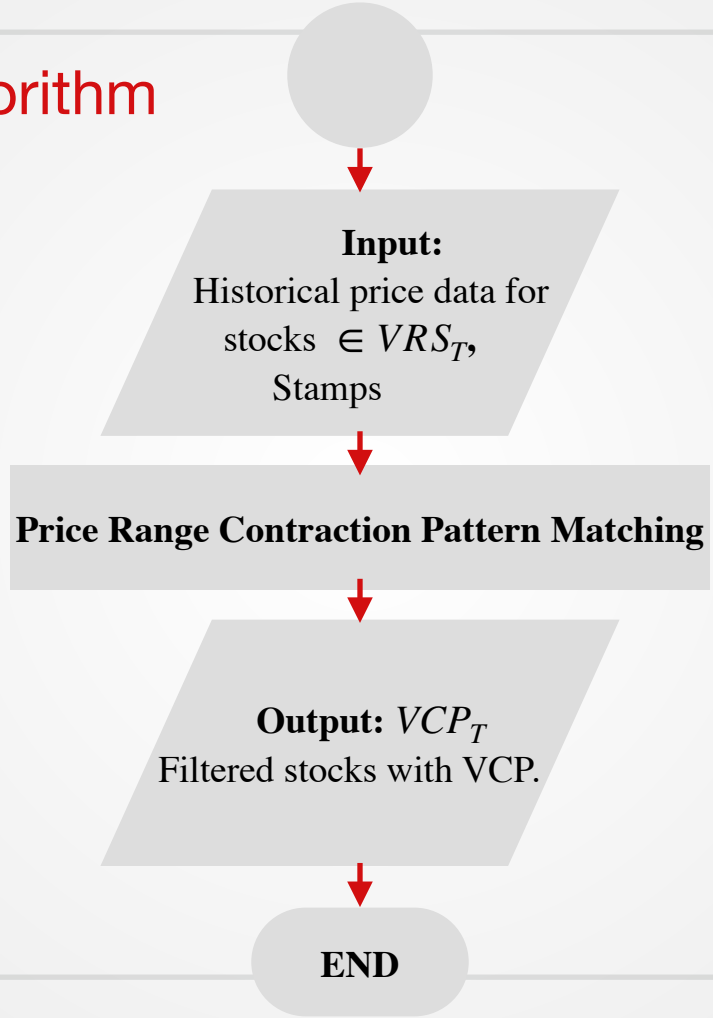


Source:
Minervini, M. (2013). Trade Like a Stock Market Wizard: How to Achieve Super Performance in Stocks in Any Market. McGraw-Hill Education.

Flow chart of Algorithm



Flow chart of Algorithm



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

Algorithm :VCP Trading Strategy

Step2 : 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 ρ_j in descending order
- Select top 50 stocks with highest similarity score:

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

Research Design

Algorithm :VCP Trading Strategy

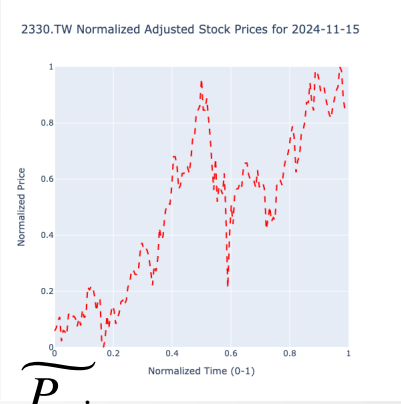
Step4 Daily Update

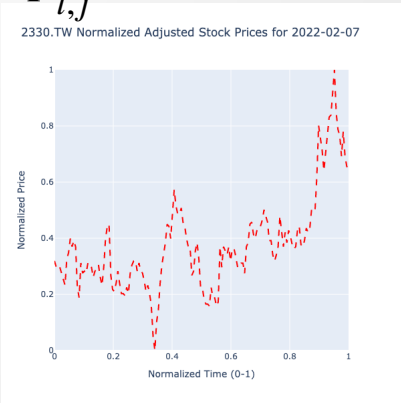
- Calculate new VCP_{T+1} each day
- Track set changes:
  - Entry: $N = VCP_{T+1} \backslash VCP_T$ (new stocks)
  - Exit: $E = \left\{ j \,|\, r_j \geq (1+\alpha) \vee r_j \leq (1-\beta) \right\}$ (removed stocks)
  - Hold: $H = \left(VCP_{T+1} \cup VCP_T \right) \backslash E$ (maintained stocks)

Appendix: Examples for Rescaling

$P_{t,j}$

$\widetilde{P}_{t,j}$



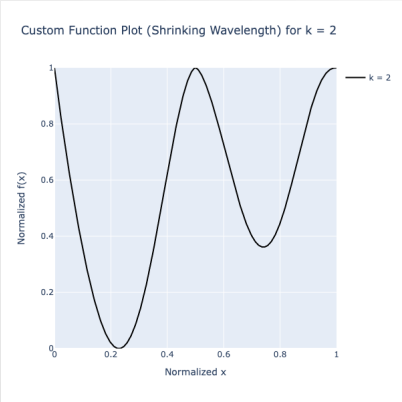


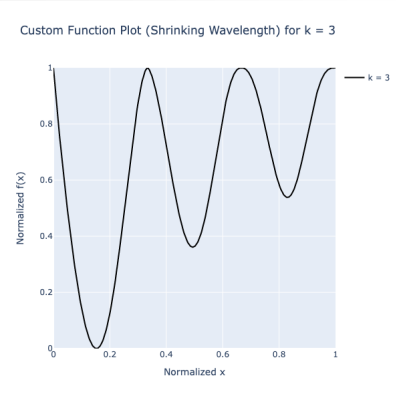
Appendix: $Stamp_k, \forall k = 2,3,\ldots,10$

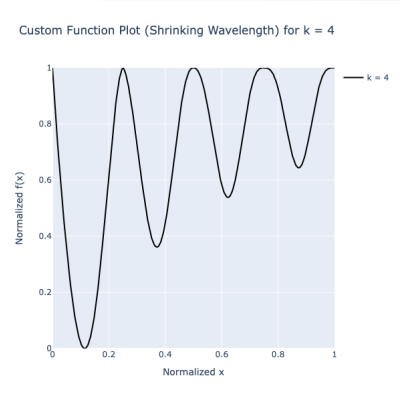
Examples

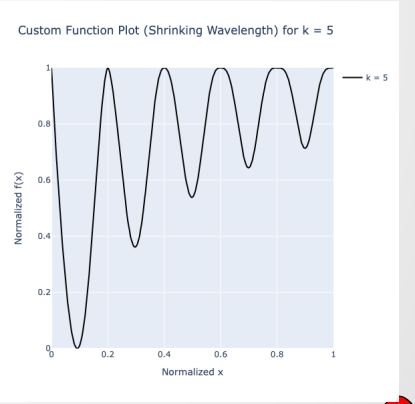
$$f(x) = -\frac{\left(\cos^2(3\pi x)\right)^x}{x},\ 0.5 < x < 0.5 + k \cdot \frac{1}{3}$$

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









Appendix: Cross-sectional Ranking

Examples

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

	ρ_j
$stock_1$	0.99
$stock_2$	0.96
.	.
.	.
.	.
$stock_n$	0.063

Rank =50

Study Plan

Pin Yu Chen (Alice)

Department of Information Management and Finance, National Yang Ming Chiao Tung University.
Email: pinyu0105.mg12@nycu.edu.tw