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

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Outline

1. Topic Review

2. Flow chart

3. Methodology

4. Result

Motivation & Goal

⊡ **Inspired by Mark Minervini**: Winner of 2021 U.S. Investing Championship

with **338.42% return**

⊡ **VCP mastery**: Proven breakout pattern identification

⊡ **Strategy**: Combines **technical strength & fundamentals**

⊡ **Goal**: Apply VCP in Taiwan market

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Objective:
Capture stocks with strong upward momentum in a short period.
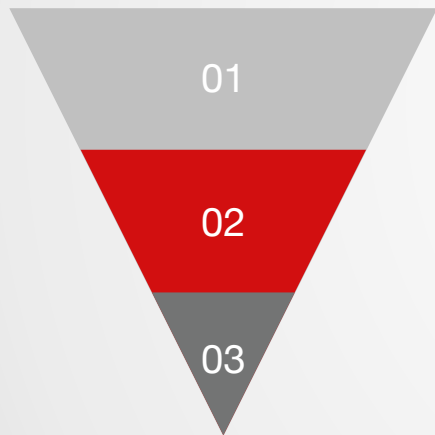
01   Filter 1: Stage 2

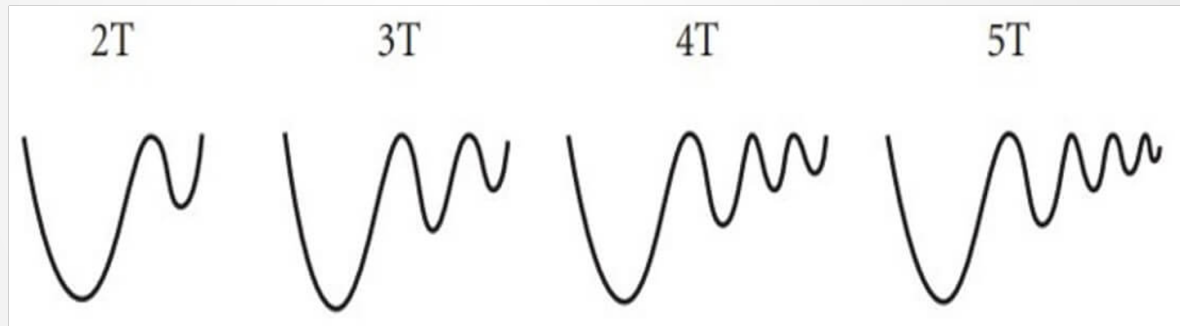02   **Filter 2: VCP**

03   Filter3: Strong fundamental support

VCP

The development of the VCP pattern includes:

⊡ Decreased trading volume

⊡ **Price range contraction**
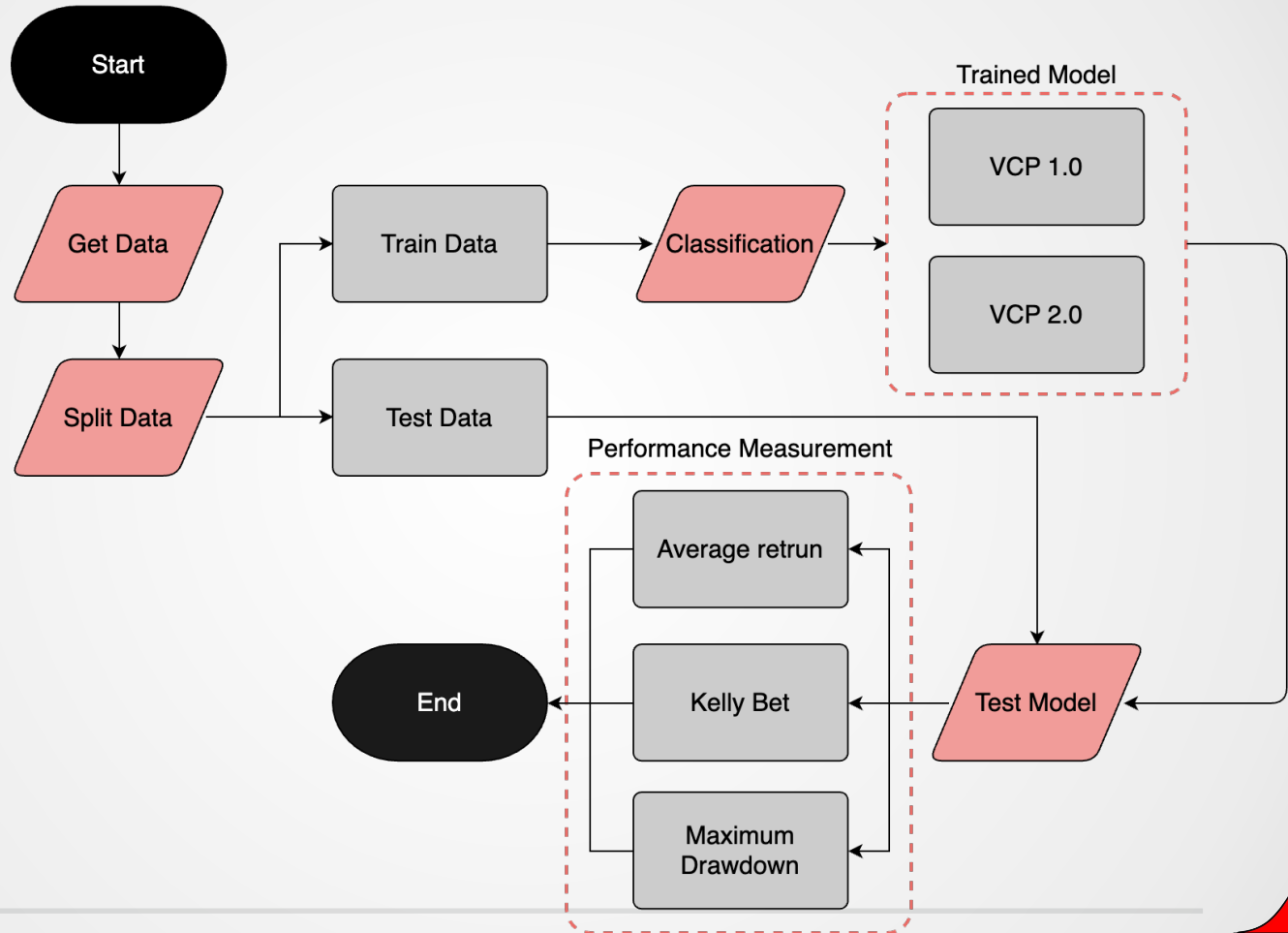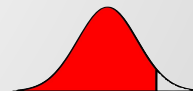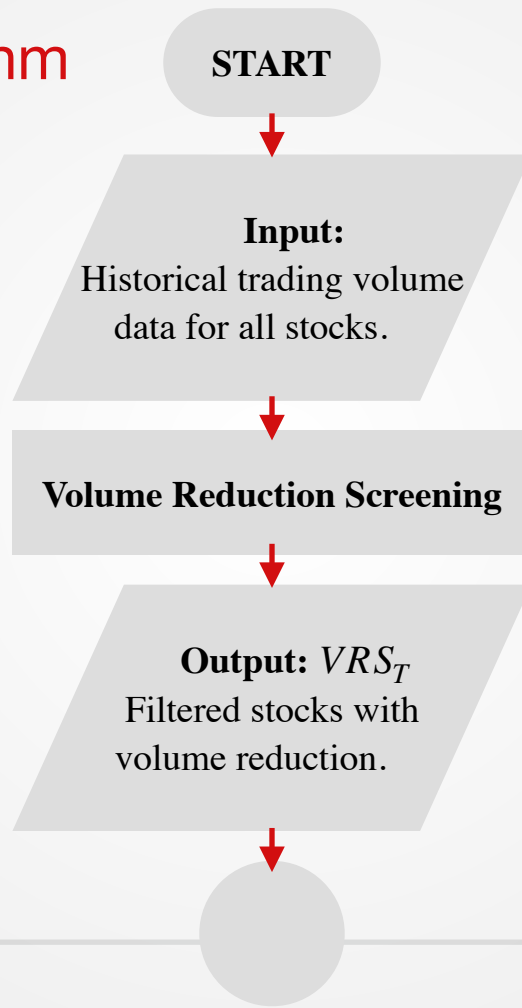
Examples

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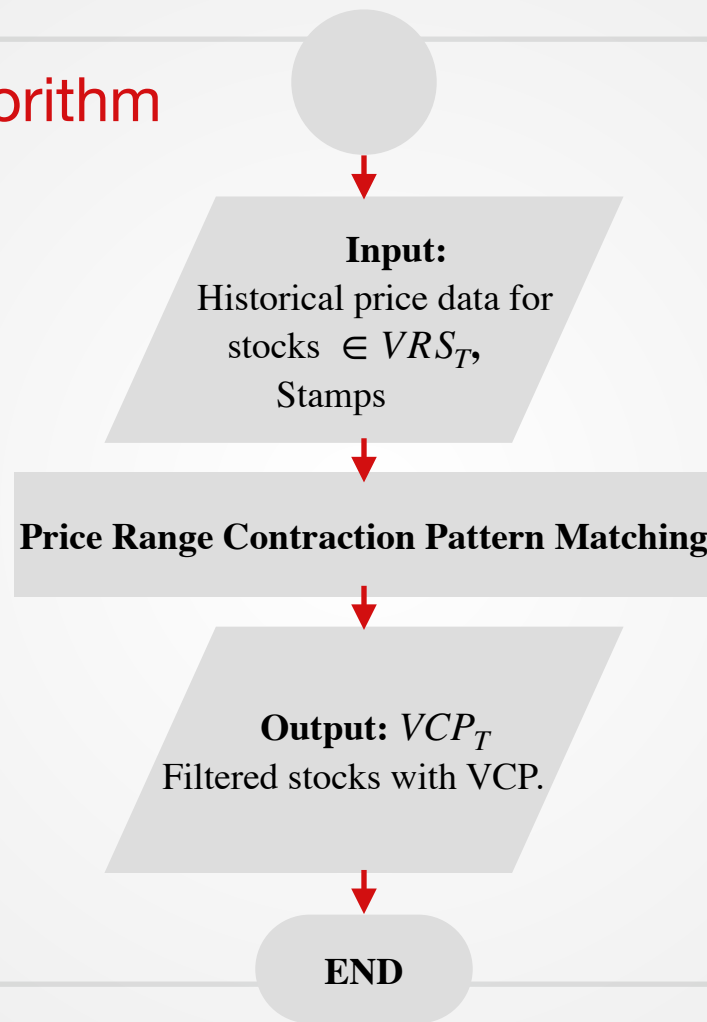
Flow chart

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  ∈ VRS_T,   │
│      Stamps             │
└─────────────────────────┘
         │
         ▼
┌─────────────────────────────────────────┐
│  Price Range Contraction Pattern Matching│
└─────────────────────────────────────────┘
         │
         ▼
┌─────────────────────────┐
│   Output: VCP_T         │
│  Filtered stocks with   │
│        VCP.             │
└─────────────────────────┘
         │
         ▼
      ( END )
```

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

Price Range Contraction Pattern Matching

Output: VCP_T
Filtered stocks with VCP.

END

Algorithm

VCP Trading Strategy

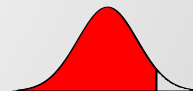> **Step1** :Volume Reduction Screening

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:

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

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

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

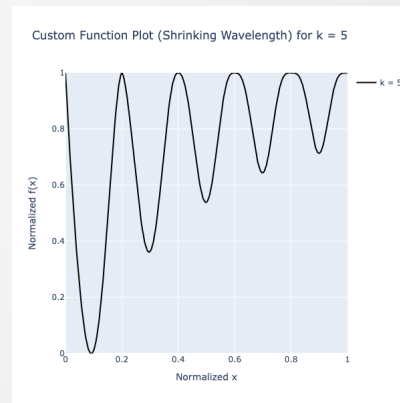# Appendix: Examples for Rescaling

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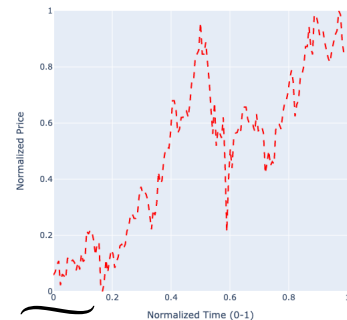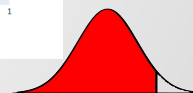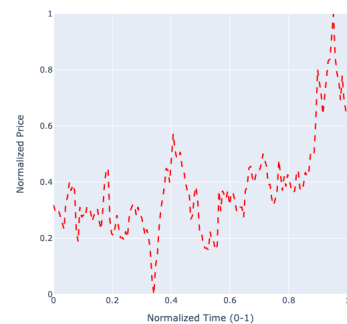
Appendix: $Stamp_k, \forall k = 2,3,\ldots,10$

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

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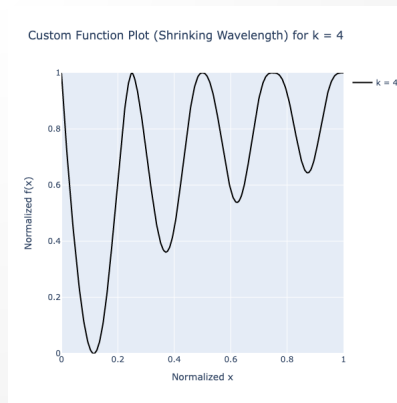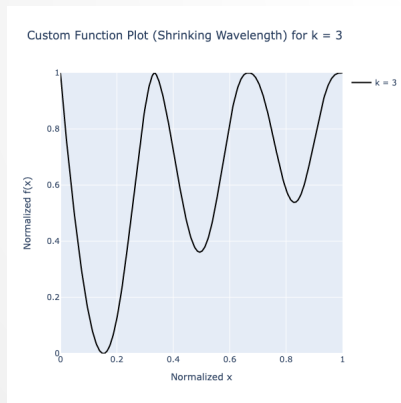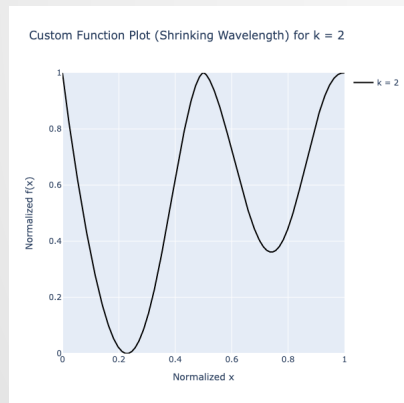
Algorithm

VCP Trading Strategy

Step3 :Cross-sectional Ranking

- Sort all ρ_j in descending order

- Select top 50 stocks with highest similarity score:

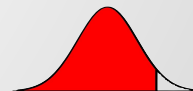$$VCP_T = \left\{ j \mid rank\left(\rho_j\right) \leq 50 \right\}$$

Appendix: Cross-sectional Ranking

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

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

Rank =50

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)

Result

|	VCP 1.0	VCP 2.0
Number of Trades	4,053	2,983
Win Rate	50.20%	49.59%
Average Win Return(bp)	550.03	491.36
Average Loss Return(bp)	-423.93	-393.44
Average Return per Trade(bp)	65.67	45.59
Win/Loss Ratio	1.3	1.25
Kelly Criterion	11.88%	9.26%
Holding period(day)	6	6
MDD	-21.40%	-19.60%

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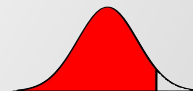
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Filter 2: VCP

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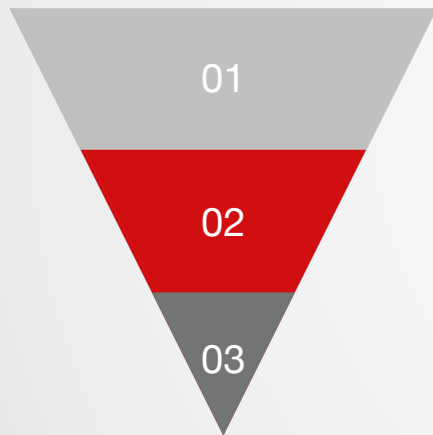
Filter3: Strong fundamental support

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