A top-down view of a workspace. In the top left, a portion of a silver laptop is visible, showing the keyboard and trackpad. Below it is a spiral-bound notebook with a silver cover and a green spine. A silver paper clip is attached to the right page of the notebook, and a small green rectangular object is on the left page. To the right of the notebook is a small green cup filled with dark coffee. In the bottom left, another silver paper clip lies on the surface. The background is a plain, light gray surface.

# 工作進度報告

---

投資因子分析

# 目錄 | Contents



1. 資料現況

2. 基本因子模型

3. 試用演算法

4. 預期新增因子

5. 流程圖



# 資料現況

---

# 資料現況

	A	B	C	D	E	F	G
1	date	TICKER	COMNAM	SHRCLS	DIVAMT	PRC	shares
2	200501	BRK	BERKSHIRE HATHAWAY INC DEL	A		89900	2855
3	200502	BRK	BERKSHIRE HATHAWAY INC DEL	A		90200	2855
4	200503	BRK	BERKSHIRE HATHAWAY INC DEL	A		87000	2855
5	200501	MO	ALTRIA GROUP INC			63.83	3530211
6	200502	MO	ALTRIA GROUP INC			65.65	3530211
7	200503	MO	ALTRIA GROUP INC		0.73	65.39	3530211
8	200501	CMCSK	COMCAST CORP NEW			31.61	4459182
9	200502	CMCSK	COMCAST CORP NEW			31.86	4459182
10	200503	CMCSK	COMCAST CORP NEW			33.44	4459182
11	200501	WPO	WASHINGTON POST CO	B	1.85	914.5	150712
12	200502	WPO	WASHINGTON POST CO	B		898	150712
13	200503	WPO	WASHINGTON POST CO	B		894	150712
14	200501	WFC	WELLS FARGO & CO NEW			61.3	2235885
15	200502	WFC	WELLS FARGO & CO NEW		0.48	59.38	2235885
16	200503	WFC	WELLS FARGO & CO NEW			59.8	2235885
17	200501	UST	U S T INC			50.66	2424212
18	200502	UST	U S T INC			54.65	2424212
19	200503	UST	U S T INC		0.55	51.7	2424212
20	200501	MLM	MARTIN MARIETTA MATERIALS INC			54.02	2128200
21	200502	MLM	MARTIN MARIETTA MATERIALS INC		0.2	57.68	2128200
22	200503	MLM	MARTIN MARIETTA MATERIALS INC			55.92	2128200
23	200501	SSP	SCRIPPS E W CO OHIO	A		46.36	2441020
24	200502	SSP	SCRIPPS E W CO OHIO	A	0.1	46.16	2441020

# 資料問題

## Gardner Russo & Gardner

Changes: [All](#) | [New](#) | [Increased](#) | [Decreased](#) | [Sold Out](#)

Portfolio as of: 12/31/2017 ▼

Name	Ticker	Class	Shares	Change	Value	Change	% Port	% OS	Hist	Date
INGERSOLL RAND CO LTD	IR	COM	875	875	78,000	78,000	0.00		Hist	12/31/2017
DAIMLER AG	DAI	Common	902	902	77,000	77,000	0.00		Hist	12/31/2017
HERSHEY CO	HSY	Common	676	676	77,000	77,000	0.00	0.00	Hist	12/31/2017
CSX CORP	CSX	Common	1,400	1,400	77,000	77,000	0.00	0.00	Hist	12/31/2017
Graham Holdings Co	GHC	COM	138	138	77,000	77,000	0.00	0.00	Hist	12/31/2017
Anheuser-Busch InBev SA/NV	BUD	ADR	665	-2,000	74,000	-244,000	0.00		Hist	12/31/2017
FASTENAL CO	FAST	Common	1,275	1,275	70,000	70,000	0.00	0.00	Hist	12/31/2017
UGI CORP /PA/	UGI	Common	1,500	1,500	70,000	70,000	0.00	0.00	Hist	12/31/2017
PFIZER INC	PFE	Common	1,900	1,900	69,000	69,000	0.00	0.00	Hist	12/31/2017
WEYCO GROUP INC	WEYS	Common	2,250	2,250	67,000	67,000	0.00	0.02	Hist	12/31/2017
PZ Cussons plc/ADR	PZCUF	COM	15,000	15,000	66,000	66,000	0.00		Hist	12/31/2017
CAMPBELL SOUP CO	CPB	Common	1,300	1,300	63,000	63,000	0.00	0.00	Hist	12/31/2017
AT&T CORP	T	Common	1,500	1,500	58,000	58,000	0.00		Hist	12/31/2017
LOCKHEED MARTIN CORP	LMT	Common	170	170	55,000	55,000	0.00	0.00	Hist	12/31/2017
CELGENE CORP /DE/	CELG	Common	500	500	52,000	52,000	0.00	0.00	Hist	12/31/2017
BAYERISCHE MOTOREN WERKE AG	BAMXF	Common	500	500	52,000	52,000	0.00		Hist	12/31/2017
Yoox S P A Shs Prive Di Valore	YXOXF	COM	1,500	1,500	52,000	52,000	0.00		Hist	12/31/2017
Yum! China Holding, Inc.	YUMC	Common	1,200	1,200	48,000	48,000	0.00		Hist	12/31/2017
CONSTELLATION BRANDS, INC.	STZ	CL A	200	200	46,000	46,000	0.00	0.00	Hist	12/31/2017

# 2017/12/31

# 2018/03/31

## Gardner Russo & Gardner

Changes: [All](#) | [New](#) | [Increased](#) | [Decreased](#) | [Sold Out](#)

Portfolio as of: 03/31/2018 ▼

Name	Ticker	Class	Shares	Change	Value	Change	% Port	% OS	Hist	Date
FEDEX CORP	FDX	Common	0	-370	0	-92,000	0.00	0.00	Hist	03/31/2018
GENESEE & WYOMING INC	GWR	Common	0	-225	0	-18,000	0.00	0.00	Hist	03/31/2018
NIKE INC	NKE	Common	0	-2,350	0	-147,000	0.00	0.00	Hist	03/31/2018
CARLISLE COMPANIES INC	CSL	Common	0	-900	0	-102,000	0.00	0.00	Hist	03/31/2018
CONSTELLATION BRANDS, INC.	STZ	CL A	0	-200	0	-46,000	0.00	0.00	Hist	03/31/2018
VECTREN CORP	VVC	Common	0	-1,599	0	-104,000	0.00	0.00	Hist	03/31/2018

MKT, SMB, HML, RM

[https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)

RMW, CMA

[https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)

BAB, QMJ



# 基本因子模型

---

## 三因子模型

$$R_i = a_i + b_i R_M + s_i E(SMB) + h_i E(HMI) + e_i$$

$R_i$ ：股票*i*比起無風險投資的期望超額收益率

$R_M$ ：市場相對無風險投資的期望超額收益率

$SEB$ ：小市值公司相對大市值公司股票的期望超額收益率

$HMI$ ：高B/M公司股票比起低B/M的公司股票的期望超額收益率

$e_i$ ：回歸殘差項



## 四因子模型

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_{i,MKT} MKT_t + \beta_{i,SMB} SMB_t + \beta_{i,HML} HML_t \\ + \beta_{i,UMD} UMD_t + \varepsilon_{i,t}$$

UMD :高收益股票與低收益股票的收益率之差

## 五因子模型

$$R_i = a_i + b_i R_M + s_i E(SMB) + h_i E(HMI) + r_i E(RMW) + c_i E(CMA) + e_i$$

RMW :高/低盈利股票投資組合的回報之差

CMA :低/高再投資比例公司股票投資組合的回報之差



# 試用演算法

---

回歸

support vector machine(SVM)

Random Forest (RF)



# 預期新增因子

---

## 新增因子

dividend : (近一年股利總和)/(近一年平均股票收盤價)

2y10y : 美國10年公債殖利率 - 美國2年公債殖利率 (看正負號)

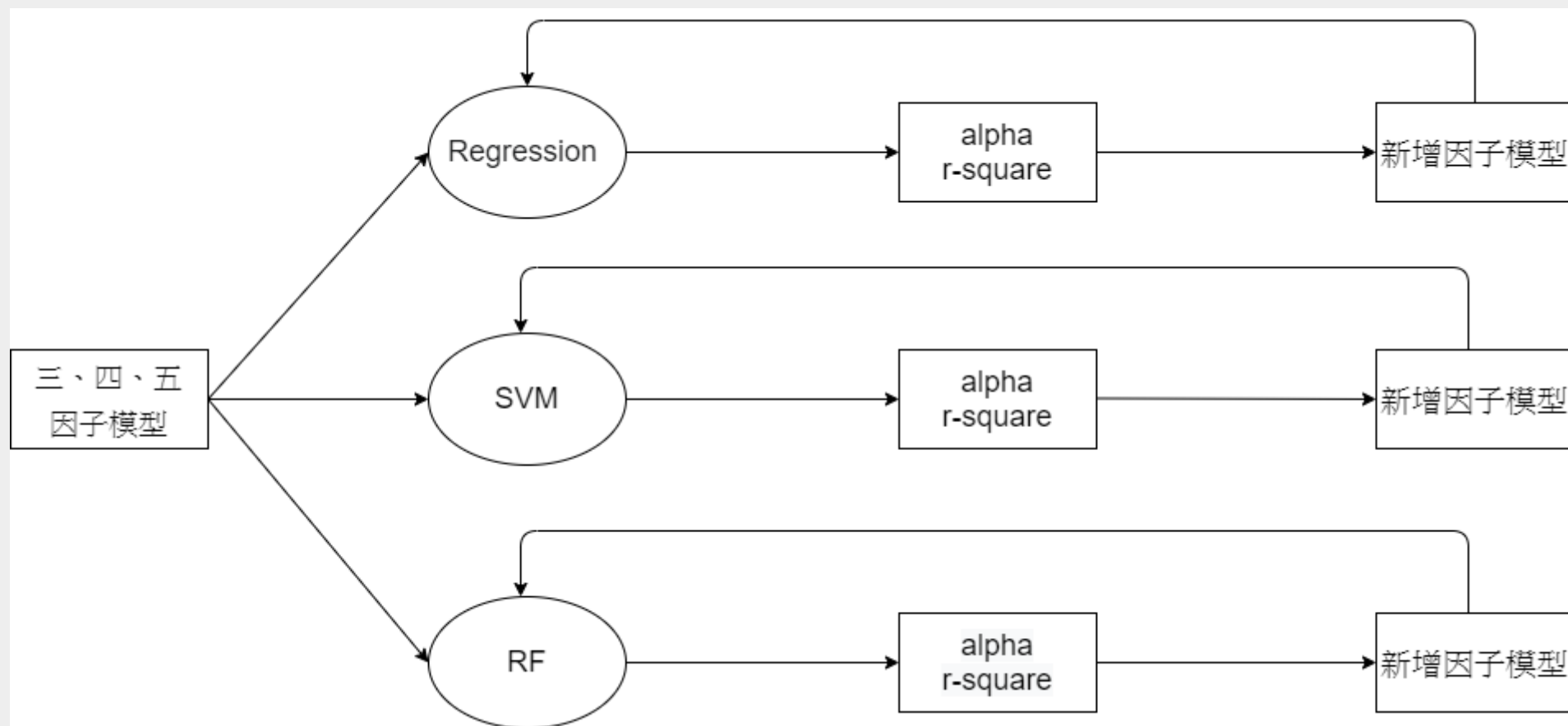
Volatility : 近三個月股價報酬的標準差



# 流程图

---

## 流程图







# THANK YOU

---