RESULTS

Table 1: Descriptive statistics of monthly returns on the Taiwanese indices and risk factors:

	Portfolio Index	*Rm*	*Rf*	*SMB*	*HML*	*MOM*
Maximum	8.58	9.61	1.13	36.81	40.77	42.50
minimum	-9.79	-7.81	1.13	-25.85	-54.85	-75.57
mean	-0.42	1.09	1.13	4.26	0.85	0.51
std. dev	4.24	4.18	0	12.12	17.69	20.21
skewness	0.007	-0.07	NaN	0.50	-0.16	-0.88
kurtosis	-0.38	-0.62	NaN	1.31	2.36	4.75

Table 2: Sharpe and Treynor ratios for our Portfolio

	Sharpe Ratio	*Treynor Ratio*
Portfolio Index	-0.36	-0.01

Table 3: Jensen's alphas and betas for our Portfolio

	Jensen's Alpha	*MKT*	*Adj. R^2*
Portfolio Index	-1.52	0.96	0.90

Table 4: Fama–French three-factor alphas for our Portfolio

	Three-factor Alphas	*MKT*	*SMB*	*HML*	*Adj.R2*
Portfolio Index	-1.51	0.95	-0.003	0.008	0.902

Table 5: Carhart's alphas for our Portfolio

	Carhart's Alphas	*MKT*	*SMB*	*HML*	*MOM*	*Adj.R2*
Portfolio Index	-1.56	0.95	-0.0004	0.09	-0.08	0.90

ABSTRACT

We calculate the returns on the two Japanese stock indices as follows:

$$R_{i,t} = LN\left({P_{i,t}}/{P_{i,t-1}}\right)$$

where $R_{i,t}$ denotes the return on the Portfolio index i in month t, and $P_{i,t}$ is its closing value.

$$Sharpe\ Ratio = \frac{R_i - R_f}{\sigma_i}$$

$$Treynor\ Ratio = \frac{R_i - R_f}{\beta_i}$$

We analyzed the Taiwan Stock Market Data and estimated the Jensen, Fama-French three factor and Carhart alphas using the following models:

JENSEN'S MODEL

The Jensen's Model is:

$$R_{i,t} - R_{f,t} = \alpha_i^{Jensen} + \beta_i^{MKT}\left(R_{m,t} - R_{f,t}\right) + \epsilon_{i.t}$$

where:

R_{it} = Total return of stock or portfolio i at time t R_{ft} = risk free rate of return at time t

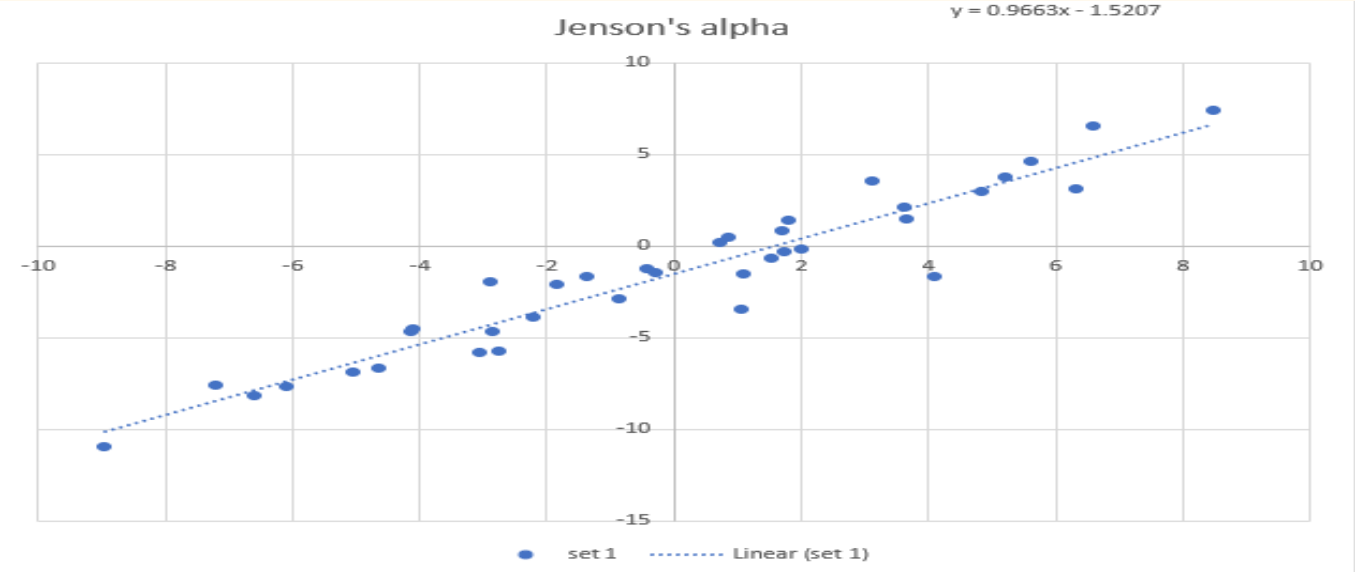


Figure 1: Linear Regression to Calculate Jenson's alpha and beta values

FAMA AND FRENCH THREE-FACTOR MODEL

The Fama and French Three-Factor Model (or the Fama French Model for short) is an asset pricing model developed in 1992 that expands on the capital asset pricing model (CAPM) by adding size risk and value risk factors to the market risk factor in CAPM. This model considers the fact that value and small-cap stocks outperform markets on a regular basis. By including these two additional factors, the model adjusts for this outperforming tendency, which is thought to make it a better tool for evaluating manager performance.

The formula for the Fama French model is :

$$R_{i,t} - R_{f,t} = \alpha_i^{FF3F} + \beta_i^{MKT}(R_{m,t} - R_{f,t}) + \beta_i^{SMB} SMB_t + \beta_i^{HML} HML_t + \epsilon_{i.t}$$

where:

R_{it} = Total return of a stock or portfolio i at time t

R_{ft} = risk free rate of return at time t

R_{Mt} = total market portfolio returns at time t

$R_{it} - R_{ft}$ = expected excess return

$R_{Mt} - R_{ft}$ = excess return on the market portfolio (index)

SMB_t = size premium (small minus big)

HML_t = value premium (high minus low)

$\beta_{1,2,3}$ = factor coefficients

CARHART MODEL

The formula for Carhart model is:

$$R_{i,t} - R_{f,t} = \alpha_i^{Carhart} + \beta_i^{MKT}(R_{m,t} - R_{f,t}) + \beta_i^{SMB} SMB_t + \beta_i^{HML} HML_t + \beta_i^{MOM} MOM_t + \epsilon_{i.t}$$

where:

R_{it} = Total return of a stock or portfolio i at time t

R_{ft} = risk free rate of return at time t

R_{Mt} = total market portfolio return at time t

$R_{it} - R_{ft}$ = expected excess return

$R_{Mt} - R_{ft}$ = excess return on the market portfolio (index)

SMB_t = size premium (small minus big)

HML_t = value premium (high minus low)

MOM_t= return premium (winners minus losers)

$\beta_{1,2,3,4}$ = factor coefficients

CONSTRUCTION OF FACTORS

We can construct SMB, HML and MOM factors following the steps:

(i) Calculate the excess returns, i.e. $\boldsymbol{R_i - R_f}$.

(ii) Sort the excess returns on Size (market capitalization) and then on value (ROE).

(iii) Denote bottom 30 percent, middle (40 percent) and top (30 percent) as Small, Medium and Big when arranged according to their market capitalisation.

(iv) Denote bottom 30 percent, middle (40 percent) and top (30 percent) as Value, Neutral and Growth when arranged according to their (BM) ratio, which in this case is calculated from return on investments form the data.

(v) Winners are calculated by taking the top 30% of all the stocks according to the returns on the stocks. The returns are calculated according to the Price Indices of the different stocks.

(vi) Similarly, losers are calculated by taking the bottom 30% of all the stocks according to the returns on the stocks.

(vii) Use the formula to calculate SMB:

SMB= ⅓*(small value + small neutral + small growth) − ⅓*(big value + big neutral + big growth)

SMB= ⅓*(S_1V_1 + S_1V_2 + S_1V_3) − ⅓*(S_3V_1 + S_3V_2 + c)

(viii) Use the formula to calculate HML:

HML = ½*(small value + big value) − ½*(small growth + big growth)

HML = ½*(S_1V_1 + S_3V_1) − ½*(S_1V_3 + S3*V3)

The HML factor is thus designed to capture the effect of value while being largely free of the influence of size.

(ix) Use the formula to calculate MOM:

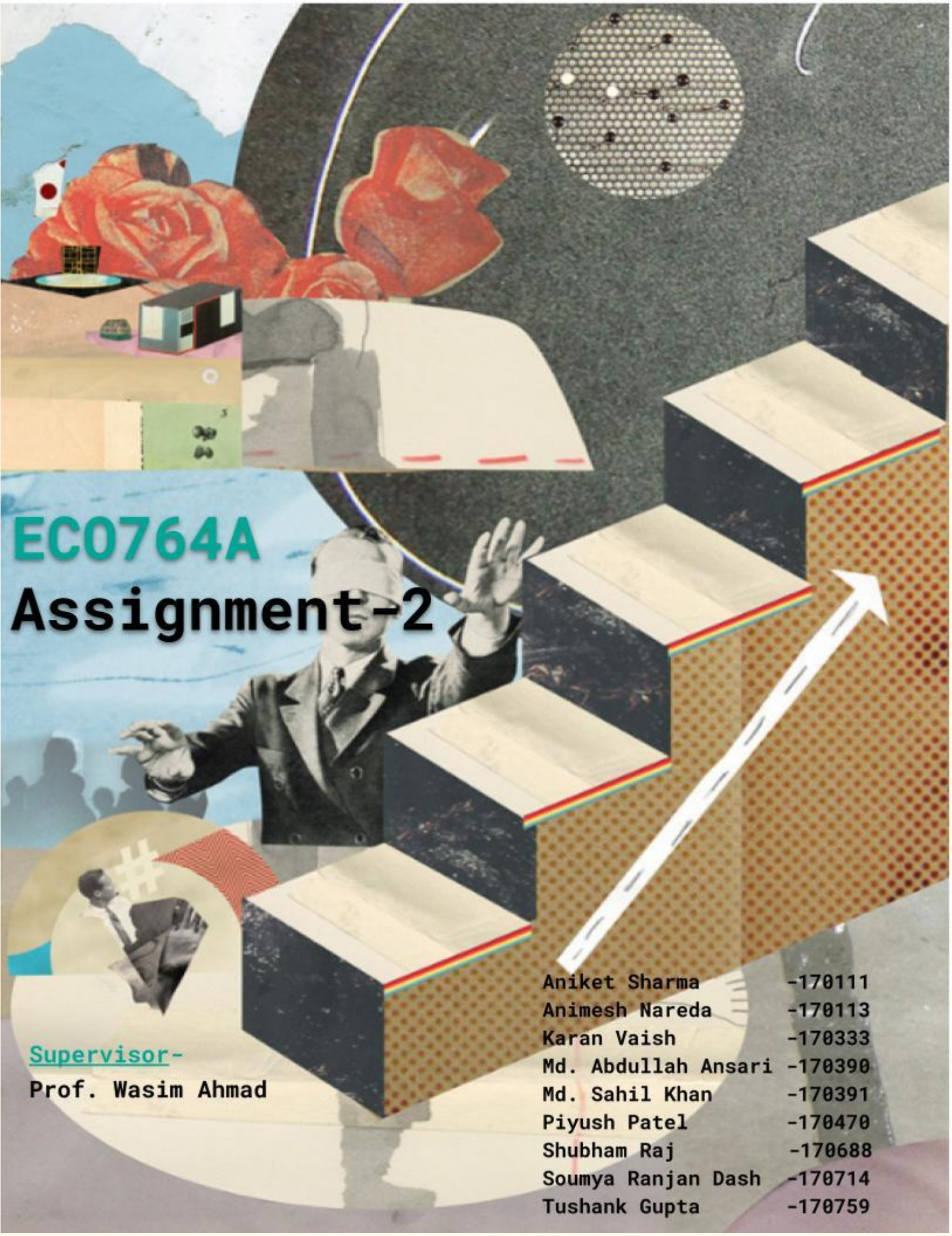
MOM = ½*(small winner + big winner) − ½*(small loser + big loser)

MOM = ½*(S_1W_1+ S_3W_1) − ½*(S_1W_2 + S_2W_2)

The MOM factor is thus designed to capture the effect of the past performance value while being largely free of the influence of size and book to market ratio.

COMPANIES LIST

TAIWAN SEMICON.MNFG.	YAGEO
HON HAI PRECN.IND.	ACCTON TECHNOLOGY
MEDIATEK	ACER
CHUNGHWA TELECOM	ALCHIP TECHNOLOGIES
FORMOSA PETROCHEMICAL	ASIA CEMENT
DELTA ELECTRONICS	ASMEDIA TECHNOLOGY
UNITED MICRO ELTN.	ASUSTEK COMPUTER
CATHAY FINL.HLDG.	AU OPTRONICS
FORMOSA PLASTICS	CATCHER TECHNOLOGY
FUBON FINL.HLDG.	CHAILEASE HOLDING
NAN YA PLASTICS	CHANG HWA COML.BANK
CTBC FINL.HLDG.	CHENG SHIN RUB.INDS.
FORMOSA CHEMS.& FIBRE	CHICONY ELECTRONICS
LARGAN PRECISION	CHINA AIRLINES
MEGA FINANCIAL HOLDING	CHINA DEV.FINL.HLDG.
UNIPRESIDENT ENTS.	CHINA LIFE INSURANCE
ADVANTECH	CHROMA ATE
AIRTAC INTERNATIONAL GP.	COMPAL ELECTRONICS
CHINA STEEL	COMPEQ MANUFACTURING
E SUN FINL.HLDG.	ECLAT TEXTILE
FIRST FINANCIAL HOLDING	ELITE MATERIAL
HOTAI MOTOR	ENNOSTAR
NANYA TECHNOLOGY	EVA AIRWAYS
NOVATEK MICROELS.	EVERGREEN MARINE
PRESIDENT CHAIN STORE	FAR EASTERN NEW CENTURY
QUANTA COMPUTER	FAR EASTONE TELECOM.
TAIWAN MOBILE	FENG TAY ENTERPRISES
GENIUS ELECTRONIC OPTC.	FORMOSA TAFFETA
GIANT MNFG.	FOXCONN TECHNOLOGY
GIGA	



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