

PAPER – 1 : STRATEGIC FINANCIAL MANAGEMENT (NEW SYLLABUS)-SOLUTIONS

Question 1(a)

Year	Divd. /Sale	PVF (12%)	PV (Rs.)
1	Rs. 20/-	0.893	17.86
2	Rs. 20/-	0.797	15.94
3	Rs. 20/-	0.712	14.24
4	Rs. 24/-	0.636	15.26
5	Rs. 24/	0.567	13.61
6	Rs. 24/	0.507	12.17
7	Rs. 24/	0.452	10.85
7	Rs. 1026/- (Rs. 900 x 1.2 x 0.95)	0.452	463.75
			Rs. 563.68
Less : Cost of Share (Rs. 500 x 1.05)		Rs. 525.00	
Net gain		Rs. 38.68	

Since Mr. A is gaining Rs. 38.68 per share, he should buy the share.

Maximum price Mr. A should be ready to pay is Rs. 563.68 which will include incidental expenses.

So the maximum price should be Rs. 563.68 x 100/105 = Rs. 536.84

Question 1(b)

Shares	No. of shares (lakhs) (1)	Market Price of Per Share (2)	(1) × (2) (Rs. lakhs)	% to total (w)	β (x)	wx
A Ltd.	3.00	500.00	1500.00	0.30	1.40	0.42
B Ltd.	4.00	750.00	3000.00	0.60	1.20	0.72
C Ltd.	2.00	250.00	500.00	0.10	1.60	0.16
			5000.00			1.30

(i) Portfolio beta 1.30

(ii) Required Beta 0.91

Let the proportion of risk free securities for target beta 0.91 = p

$$0.91 = 0 \times p + 1.30 (1 - p)$$

$$p = 0.30 \text{ i.e. } 30\%$$

Shares to be disposed off to reduce beta (5000 × 30%) Rs. 1,500 lakh and Risk Free securities

to be acquired.

(iii) Number of shares of each company to be disposed off

Shares	% to total (w)	Proportionate Amount (Rs. lakhs)	Market Price Per Share	No. of Shares (Lakh)
A Ltd.	0.30	450.00	500.00	0.90
B Ltd.	0.60	900.00	750.00	1.20
C Ltd.	0.10	150.00	250.00	0.60

(iv) Number of Nifty Contract to be sold

$$\frac{(1.30-0.91) \times 5000 \text{ lakh}}{8,125 \times 200}$$

$$= 120 \text{ contracts}$$

(v) 2% rises in Nifty is accompanied by $2\% \times 1.30$ i.e. 2.6% rise for portfolio of shares

	Rs. Lakh
Current Value of Portfolio of Shares	5000
Value of Portfolio after rise	5130
Mark-to-Market Margin paid ($8125 \times 0.020 \times \text{Rs. } 200 \times 120$)	39
Value of the portfolio after rise of Nifty	5091
% change in value of portfolio $(5091 - 5000) / 5000$	1.82%
% rise in the value of Nifty	2%
Beta	0.91

Question 1(c)

Every startup needs access to capital, whether for funding product development, acquiring machinery and inventory, or paying salaries to its employee. Most entrepreneurs think first of bank loans as the primary source of money, only to find out that banks are really the least likely benefactors for startups. So, innovative measures include maximizing non-bank financing.

Here are some of the sources for funding a startup:

(i) Personal financing. It may not seem to be innovative but you may be surprised to note that most budding entrepreneurs never thought of saving any money to start a business. This is important because most of the investors will not put money into a deal if they see that you have not contributed any money from your personal sources

(ii) Personal credit lines. One qualifies for personal credit line based on one's personal credit efforts. Credit cards are a good example of this. However, banks are very cautious while granting personal credit lines. They provide this facility only when the business has enough cash flow to repay the line of credit.

(iii) Family and friends. These are the people who generally believe in you, without even thinking that your idea works or not. However, the loan obligations to friends and relatives should always be in writing as a promissory note or otherwise.

(iv) Peer-to-peer lending. In this process group of people come together and lend money to each other. Peer to peer to lending has been there for many years. Many small and ethnic business groups having similar faith or interest generally support each other in their start up endeavors.

(v) Crowdfunding. Crowdfunding is the use of small amounts of capital from a large number of individuals to finance a new business initiative. Crowdfunding makes use of the easy accessibility of vast networks of people through social media and crowdfunding websites to bring investors and entrepreneurs together.

(vi) Microloans. Microloans are small loans that are given by individuals at a lower interest to a new business ventures. These loans can be issued by a single individual or aggregated across a number of individuals who each contribute a portion of the total amount.

(vii) Vendor financing. Vendor financing is the form of financing in which a company lends money to one of its customers so that he can buy products from the company itself. Vendor financing also takes place when many manufacturers and distributors are convinced to defer payment until the goods are sold. This means extending the payment terms to a longer period for e.g. 30 days payment period can be extended to 45 days or 60 days. However, this depends on one's credit worthiness and payment of more money.

(viii) Purchase order financing. The most common scaling problem faced by startups is the inability to find a large new order. The reason is that they don't have the necessary cash to produce and deliver the product. Purchase order financing companies often advance the required funds directly to the supplier. This allows the transaction to complete and profit to flow up to the new business.

(ix) Factoring accounts receivables. In this method, a facility is given to the seller who has sold the good on credit to fund his receivables till the amount is fully received. So, when the goods are sold on credit, and the credit period (i.e. the date upto which payment shall be made) is for example 6 months, factor will pay most of the sold amount upfront and rest of the amount later. Therefore, in this way, a startup can meet his day to day expenses

Question 2(a)

Conversion Price = Rs. 50 x 17 = Rs. 850

Intrinsic Value = Rs. 850

Accordingly the yield (r) on the bond shall be :

$$Rs. 850 = Rs. 100 PVAF(r, 10) + Rs. 1000 PVF(r, 10)$$

Let us discount the cash flows by 11%

$$850 = 100 PVAF(11\%, 10) + 1000 PVF(11\%, 10)$$

$$850 = 100 \times 5.890 + 1000 \times 0.352$$

$$= 91$$

Now let us discount the cash flows by 13%

$$850 = 100 PVAF(13\%, 10) + 1000 PVF(13\%, 10)$$

$$850 = 100 \times 5.426 + 1000 \times 0.295$$

$$= -12.40$$

Accordingly, IRR

$$11\% + \frac{(13\% - 11\%) \times 90.90}{12.40}$$

$$= 12.76\%$$

$$= 12.76\%$$

The spread from comparable bond = 12.76% - 11.80% = 0.96%

Question 2(b)

							2.8.2017		
		1st August 2017	2nd August 2017	Value	Increase			2.8.2017	
Com	No. of Shares	Market price per share	Market price per share	1.8.2017			No. of Shares	Value	
Q Ltd.	2,000	200	205	4,00,000			2,000	410000	
R Ltd.	30,000	312.4	360	93,72,000	8000	2499200	38,000	13680000	
S Ltd.	40,000	180.6	191.55	72,24,000			40,000	7662000	
T Ltd.	60,000	505.1	503.9	3,03,06,000			60,000	30234000	
Bank						500800		500800	
				4,73,02,000		3000000		5,24,86,800	
			No of Units	600000	38,053.36			6,38,053.36	
			NAV	78.84	78.84			82.26	

Question 2(c)

A 'Reverse Stock Split' is a process whereby a company decreases the number of shares outstanding by combining current shares into fewer or lesser number of shares. For example, in a 5 : 1 reverse split, a company would take back 5 shares and will replace them with one share. Although, reverse stock split does not result in change in Market value or Market Capitalization of the company but it results in increase in price per share. Considering above mentioned ratio, if company has 100 million shares outstanding having Market Capitalisation of Rs. 500 crore before split up, the number of shares would be equal to 20 million after the reverse split up and market price per share shall increase from Rs. 50 to Rs. 250.

Reasons for Reverse Split Up

Although Reverse Split up is not so popular especially in India but company carries out reverse split up due to following reasons:

(i) Avoiding delisting from stock exchange: Sometimes as per the stock exchange regulations if the price of shares of a company goes below a certain limit it can be delisted. To avoid such delisting company may resort to reverse stock split up.

(ii) Avoiding removal from constituents of Index: If company's share is one of the constituents of the market index then to avoid their removal of scrip from this list due to persistent fall in the prices of share, the company may take reverse split up route.

(iii) To avoid the tag of "Penny Stock": If the price of shares of a company goes below a limit it may be called "Penny Stock". In order to improve the image of the company and avoiding this stage, the company may go for Reverse Stock Split.

(iv) To attract Institutional Investors and Mutual Funds: It might be possible that institutional investors may be shying away from acquiring low value shares and hence to attract these investors the company may adopt the route of Reverse Stock Split up to increase the price per share

Question 3(a)

(i) Return of a US Investor = $\frac{1919 - 2028 * 100}{2028} = -5.37\%$

(ii) Return of Mr. X

Initial Investment (Rs.)	1.58 Crore
Applicable Exchange Rate on 1.1.20x1	Rs. 62.25
Equivalent US\$	US\$ 2,53,815.26
Purchase Price of Standard & Poor Index	2028
No. of Standard & Poor Indices Purchased	125.16
Ending Price of Standard & Poor Index	1919
Proceeds realised in US\$ on sale of Standard & Poor Index	US\$ 2,40,182.04
Applicable Exchange Rate on 1.1.20x2	Rs. 67.25
Proceeds realised in INR on sale of Standard & Poor Index	Rs. 1,61,52,242
Rate of Return	
$\frac{(16152242 - 15800000) * 100}{15800000}$	2.23%

iii) Rate of Return had the amount been invested in India

Initial Investment (Rs.)	1.58 Crore
Purchase Price of Indian Index	7395
No. of Standard & Poor Indices Purchased	2136.58
Let Ending Price of Indian Index	X
Then to be indifferent with return in International Market	
$\frac{2136.58 * (X - 1.58) * 100}{1.58} = 2.23$	

Price of Indian Index to be indifferent 7559.90

Question 3(b)

(i) Forward rate 3mX6m

Interest for 6 months

= interest for 0 to 3 months and interest for 3 to 6 months

For USD

$$(1 + 0.05 * 6/12) = (1 + 0.045 * 3/12) (1 + r * 3/12)$$

$$r = 5.4388\%$$

For JPY

$$r = 0.25\%$$

(ii)

6/12 rate quoted by bank 6.5% and 6.75%

6/12 implicit rate using 6 month libor and 12 month interest rate

Interest for 12 months

= interest for 0 to 6 months and interest for 6 to 12 months

$$(1 + 0.065) = (1 + 0.05 * 6/12) (1 + r * 6/12)$$

$$r = 7.8\%$$

Bank quote = 6.50 – 6.75

Arbitrage Opportunity available , pay 6.75 receive 7.8

0 to 6 months	5%
0 to 12 months	6.5%
6 to 12 months	6.75%

Today Borrow 100\$ for 6 months at 5%

Today Deposit 100\$ for 12 months 6.5%

Today Enter into 6X12 FRA@6.75% for 102.5\$

After 6 months

Execute FRA, borrow 102.5\$

Use it to repay 102.5 the 6 months borrowings

After 12 months

Deposit matures at $100\$(1+0.065) = 106.5\$\text{}$

Repayment under FRA, $102.5(1+0.0675*6/12) = 105.96\$\text{}$

Riskless profit $106.5\$\text{-}105.96\$\text{ = }0.54\$\text{ for every }100\ borrowed

Question 3(c)

On the basis of different maturity characteristics, the securitized instruments can be divided into following three categories:

(i) Pass Through Certificates (PTCs): As the title suggests originator (seller of eh assets) transfers the entire receipt of cash in form of interest or principal repayment from the assets sold. Thus, these securities represent direct claim of the investors on all the assets that has been securitized through SPV.

Since all cash flows are transferred the investors carry proportional beneficial interest in the asset held in the trust by SPV.

It should be noted that since it is a direct route any prepayment of principal is also proportionately distributed among the securities holders. Further, due to these characteristics on completion of securitization by the final payment of assets, all the securities are terminated simultaneously.

Skewness of cash flows occurs in early stage if principals are repaid before the scheduled time.

(ii) Pay Through Security (PTS): As mentioned earlier, since, in PTCs all cash flows are passed to the performance of the securitized assets. To overcome this limitation and limitation to single mature there is another structure i.e. PTS.

In contrast to PTC in PTS, SPV debt securities backed by the assets and hence it can restructure different tranches from varying maturities of receivables.

In other words, this structure permits desynchronization of servicing of securities issued from cash flow generating from the asset. Further, this structure also permits the SPV to reinvest surplus funds for short term as per their requirement.

Since, in Pass Through, all cash flow immediately in PTS in case of early retirement of receivables plus cash can be used for short term yield. This structure also provides the freedom to issue several debt trances with varying maturities.

(iii) Stripped Securities: Stripped Securities are created by dividing the cash flows associated with underlying securities into two or more new securities. Those two securities are as follows:

(1) Interest Only (IO) Securities

(2) Principle Only (PO) Securities

As each investor receives a combination of principal and interest, it can be stripped into two portions of Interest and Principle. Accordingly, the holder of IO securities receives only interest while PO security holder receives only principal. Being highly volatile in nature these securities are less preferred by investors.

In case yield to maturity in market rises, PO price tends to fall as borrower prefers to postpone the payment on cheaper loans. Whereas if interest rate in market falls, the borrower tends to repay the loans as they prefer to borrow fresh at lower rate of interest.

In contrast, value of IO's securities increases when interest rate goes up in the market as more interest is calculated on borrowings.

However, when interest rate due to prepayments of principals, IO's tends to fall.

Thus, from the above, it is clear that it is mainly perception of investors that determines the prices of IOs and POs.

Question 4(a)

No. of Shares = 1300/40 = 32.5 Crores

EPS = 290/32.5 = 8.923

FCFE = Net income - (Capex + Increase in WC - Depreciation) * $\frac{\text{Equity}}{\text{Equity+Debt}}$

= 8.923 - (47 + 3.45 - 39) * 73%

= 8.923 - 8.3585

= 0.5645

Cost of Equity = $R_f + \beta (R_m - R_f)$

= 8.7 + 0.1 (10.3 - 8.7) = 8.86%

$P_0 = \frac{FCFE_0(1+g)}{K_e - g}$

Ke-g

= $\frac{0.5645(1+0.08)}{0.0886 - 0.08}$

= 70.89

Question 4(b)

Current market price = ₹ 220.

Risk free rate = 20% p.a, Time period = 6 months. Stock price movement 100% up or 100% down,

Strike Price = 165

Step 1 : $p = \frac{F - L}{H - L}$

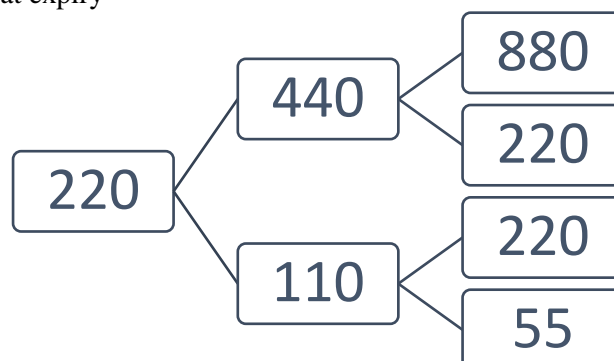
= $\frac{(220 * 1.1) - (220 * 0.5)}{(220 * 2) - (220 * 0.5)}$

= 0.40

p = 0.40

1-p = 0.60

Step 2 : Future prices at expiry



Step 3 : Value of option

1. Compute IV at expiry

$$V_1 = 715, V_2 = 55, V_3 = 55, V_4 = 0$$

2. Compute Expected IV at period 1 = EV_1, EV_2

$$EV_1 = \frac{715 * 0.40 + 55 * 0.60}{(1+0.1)}$$

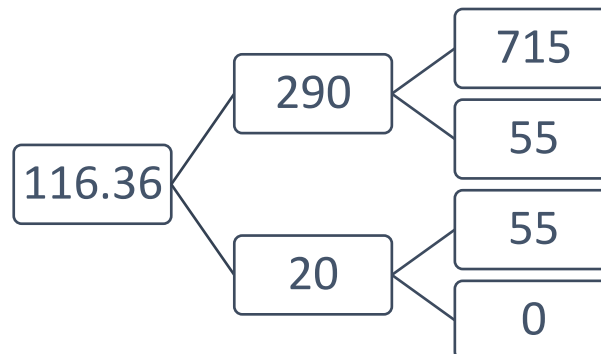
$$EV_1 = 290$$

$$EV_2 = \frac{55 * 0.40 + 0 * 0.60}{(1+0.1)}$$

$$EV_2 = 20$$

3. Compute Value of option at present

$$VC = \frac{290 * 0.40 + 20 * 0.60}{(1+0.1)} = 116.36$$



(b) Option Delta for the second six month, in case stock price rises to ₹ 440 or falls to ₹ 110.

$$\text{Option Delta} = \frac{\text{Change in Intrinsic value}}{\text{Change in Market price}}$$

$$\begin{aligned} \text{In case stock price rises to ₹ 440} \\ &= \frac{715 - 55}{880 - 220} \\ &= 1 \end{aligned}$$

$$\begin{aligned} \text{In case stock price falls to ₹ 110} \\ &= \frac{55 - 0}{220 - 55} \\ &= 0.33 \end{aligned}$$

(c) Delta = 0.33

1 Call option = 0.33 Shares

? = 1 Share

$$1/0.33 = 3$$

1 Share = 3 call options

	Today	After 6 months	
		MP=220	MP=55
On Shares	Borrow and Sell at Rs.110	Purchase at 220 And repay Loss of 110	Purchase 55 And repay Profit of 55
On Call option	Holder by paying 3 options*20 = 60	IV = 220-165 165 Profit = 165	IV = 0 0 0
On Money	Deposit	Deposit matures	Deposit matures

	$110 - 60 = 50$	$50 * (1 + 0.10) = 55$	$50 * (1 + 0.10) = 55$
		Interest = 5	Interest = 5
Net		$-110 + 165 + 5$	$55 + 5$
		60	60

Question 4(c)

Evaluation of Technical Analysis

Technical Analysis has several supporters as well several critics. The advocates of technical analysis offer the following interrelated argument in their favour:

- (a) Under influence of crowd psychology trend persist for some time. Tools of technical analysis help in identifying these trends early and help in investment decision making.
- (b) Shift in demand and supply are gradual rather than instantaneous. Technical analysis helps in detecting this shift rather early and hence provides clues to future price movements.
- (c) Fundamental information about a company is observed and assimilated by the market over a period of time. Hence price movement tends to continue more or less in same direction till the information is fully assimilated in the stock price.

Detractors of technical analysis believe that it is an useless exercise; their arguments are as follows:

- (a) Most technical analysts are not able to offer a convincing explanation for the tools employed by them.
- (b) Empirical evidence in support of random walk hypothesis cast its shadow over the usefulness of technical analysis.
- (c) By the time an uptrend and down trend may have been signaled by technical analysis it may already have taken place.
- (d) Ultimately technical analysis must be self-defeating proposition. With more and more people employing it, the value of such analysis tends to decline.

In a nutshell, it may be concluded that in a rational, well ordered and efficient market, technical analysis may not work very well. However with imperfection, inefficiency and irrationalities that characterizes the real world market, technical analysis may be helpful. If technical analysis is used in conjunction with fundamental analysis, it might be useful in providing proper guidance to investment decision makers.

Question 5(a)

- (i) Market value of Companies before Merger

Particulars	RIL	SIL
EPS	Rs 2	Re.1
P/E Ratio	10	5
Market Price Per Share	Rs 20	Rs 5
Equity Shares	10,00,000	10,00,000
Total Market Value	2,00,00,000	50,00,000

(ii) Post Merger Effects on RIL

Post merger earnings	30,00,000
Exchange Ratio (1:4)	
No. of equity shares o/s (10,00,000 + 2,50,000)	12,50,000
EPS: 30,00,000/12,50,000	2.4
PE Ratio	10
Market Value 10 x 2.4	24
Total Value (12,50,000 x 24)	3,00,00,000
Gains From Merger:	Rs
Post-Merger Market Value of the Firm	3,00,00,000
<i>Less: Pre-Merger Market Value</i>	
RIL 2,00,00,000	2,50,00,000
SIL 50,00,000	
Total gains from Merger	50,00,000

Apportionment of Gains between the Shareholders:

Particulars	RIL(Rs)	SIL(Rs)
<i>Post Merger Market Value:</i>		
10,00,000 x 24	2,40,00,000	--
2,50,000 x 24	-	60,00,000
<i>Less: Pre-Merger Market Value</i>	2,00,00,000	50,00,000
Gains from Merger:	40,00,000	10,00,000

Thus, the shareholders of both the companies (RIL + SIL) are better off than before

(iii) Post-Merger Earnings:

Increase in Earnings by 20%	
New Earnings: Rs 30,00,000 x (1+0.20)	Rs 36,00,000
No .of equity shares outstanding:	12,50,000
EPS (Rs 36,00,000/12,50,000)	Rs 2.88
PE Ratio	10
Market Price Per Share: = Rs2.88 x 10	Rs 28.80

Question 5(b)

(i) TM will make a profit of 25 basis points since a 6X9 FRA is a contract on 3-month interest rate in 6 months, which turns out to be 5.50% (higher than FRA price).

(ii) The settlement amount shall be calculated as follows

$$\frac{100\text{crore} (5.50\% - 5.25\%)(92*/360)}{1+0.055(92*/360)}$$

Rs. 6,30,032

Hence there is profit of Rs. 6,30,032 to TM Fincorp.

Alternatively, it can also be taken as 90 days.

(d) **No Hedge**

Future rate	Prob.	Cash flow	Product
1.91	0.25	1.91*300,000 = 573,000	143,250
1.95	0.60	1.95*300,000= 585,000	351,000
2.05	0.15	2.05*300,000 =615,000	<u>92,250</u>
			586,500\$

No Hedging is beneficial

Question 6(b)

Cov(x,x) = 4.8 = Variance of x = σ_x^2

Cov(y,y) = 4.25 = Variance of y = σ_y^2

Cov(m,m) = 3.10 = Variance of m = σ_m^2

Cov(x,y) = 4.3

Cov(y,m) = 2.8

Cov(x,m) = 3.37

(ii)

Weights in X = 120,000/200,000 = 0.6 Weights in Y = 80,000/200,000 = 0.4

Portfolio returns = 15*0.6 + 14*0.4 = 14.6%

Beta of X = Cov(x,m)/ σ_m^2 = 3.37/3.10 = 1.087 Beta of Y = Cov(y,m)/ σ_m^2 = 2.8/3.10 = 0.903

Portfolio Beta = 1.087*0.6 + 0.903*0.4 = 1.013

Portfolio variance = $w_x^2\sigma_x^2 + w_y^2\sigma_y^2 + 2w_xw_yCov(x,y)$
 $= 0.6^2*4.8 + 0.4^2*4.25 + (2*0.6*0.4*4.3) = 4.472$

Portfolio SD = $\sqrt{4.472} = 2.115$

(iii) Expected returns based on CAPM

Portfolio = 10 + 1.013(12-10) = 12.03%

X = 10 + 1.087(12-10) = 12.17%

Y = 10 + 0.903(12-10) = 11.806%

Systematic risk of X = $\sigma_m^2\beta_x^2 = 1.087^2 * 3.10 = 3.663$

Systematic risk of Y = $\sigma_m^2\beta_y^2 = 0.903^2 * 3.10 = 2.528$

Systematic risk of Portfolio = $\sigma_m^2\beta_p^2 = 1.013^2 * 3.10 = 3.181$

Unsystematic risk of X = $\sigma_x^2 - \sigma_m^2\beta_x^2 = 4.8 - 3.663 = 1.137$

Unsystematic risk of Y = $\sigma_y^2 - \sigma_m^2\beta_y^2 = 4.25 - 2.528 = 1.722$

Unsystematic risk of Portfolio = $\sigma_p^2 - \sigma_m^2\beta_p^2 = 4.472 - 3.181 = 1.291$

Alternatively

Unsystematic risk of Portfolio = $w_x^2\sigma_{ex}^2 + w_y^2\sigma_{ey}^2$
 $= 0.6^2 * 1.137 + 0.4^2 * 1.722$
 $= 0.685$

Portfolio risk using Sharpe method

= Systematic + Unsystematic



$$= 3.181 + 0.685$$
$$= 3.866$$

(iv) Sharpe ratio

X	$15 - 10/\sqrt{4.8} = 2.282$
Y	$14 - 10/\sqrt{4.25} = 1.94$
Portfolio	$14.6 - 10/\sqrt{4.471} = 2.175$

Traynor's ratio

X	$15 - 10/1.087 = 4.6$
Y	$14 - 10/.903 = 4.43$
Portfolio	$14.6 - 10/1.013 = 4.54$

Alpha(Jensen's Alpha)

X	$15 - 12.17 = 2.83$
Y	$14 - 11.81 = 2.19$
Portfolio	$14.6 - 12.03 = 2.57$