FACULTY OF COMMERCE

DEPARTMENT OF FINANCE

MSC FINANCE AND INVESTMENTS

PART I 2ND SEMESTER FINAL EXAMINATION– MAY 2012

FUND MANAGEMENT [CFI 5105]

TIME ALLOWED: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Answer **ALL** questions in Section A.
2. Question 1(one) is based on the provided case study
3. Answer **ANY TWO** questions in Section B.
4. Each question in section B carries 20 marks.

ADDITIONAL INFORMATION

1. Reading time allocated to question 1 (one) is 10 minutes for reading the case study
2. The paper contains 15printed pages.
3. **Section A** carry 60 marks.
4. **Section B** carry 40 marks.
5. The businesses in this question paper are intended to be fictitious

Section A [60 marks,114mins] - COMPULSORY

QUESTION ONE [Based on the following case study]

Investment Policy Statement

Prepared on: May 23, 2011

Prepared for:

Sample Foundation Client - MR
4500 Fifth Ave
Suite 2300
Pittsburgh PA 15213

Executive Summary

Client Name: Sample Foundation Client - MR
Client Type: Foundations/Endowments
Client Subtype: Public Foundation
Fiduciary Standard of Care: UPMIFA
State of Domicile: AK
Tax Id: 00-0000000
Current Assets: $5,400,000
Modeled Return: 4.7%
1-Yr Loss Limit (Worst case scenario): -2.7%
"Safe Harbor" Compliance Options: Selected

This Investment Policy Statement should be reviewed by an attorney knowledgeable in this specific area of the law. Any change to this policy should be communicated in writing and on a timely basis to all interested parties. If any term or condition of this Investment Policy Statement conflicts with any trust and/or plan document, the document shall control, as long as such term or condition is consistent with the law.

Purpose

1. Stating in a written document the committee's attitudes, expectations, objectives and guidelines for the investment of all of the portfolio's assets.
2. Encouraging effective communications between the committee and all parties involved with the investment management decisions.
3. Establishing formal criteria to select, monitor, evaluate and compare the performance results achieved by each investment option on a regular basis.
4. Complying with all applicable fiduciary, prudence and due diligence requirements experienced investment professionals would utilize, and with all applicable laws, rules and regulations from various local, state, federal and international political entities that may impact the Portfolio.

Statement of Objectives

Background

The Sample Foundation Client - MR was established in 1/1/2009. The mission of the foundation/endowment is long term growth. This IPS has been arrived at upon consideration by the Committee of a wide range of policies, and describes the prudent investment process the Committee deems appropriate. This process includes offering various asset classes and investment management styles that, in total, are expected to offer the opportunity to diversify the portfolio in a manner consistent with the specified risk and return requirements of the portfolio.

The objectives of the Portfolio are:

- Maintain the purchasing power of the current assets and all future contributions. The objective is to maintain the level of services and programs in relation to inflation.

- Maintain the level of programs and services currently provided. This can only be accomplished if sufficient total return is reinvested and new funds added to keep pace with cost increases and program expansions.
- Maximize return within reasonable and prudent levels of risk.
- Maintain an appropriate asset allocation based on a total return policy that is compatible with a flexible spending policy, while still having the potential to produce positive real returns.

4. Follow general "safe harbor" rules:

i. Use prudent experts (registered investment adviser (including mutual funds), bank, or insurance company) to make the investment decisions
ii. Demonstrate that the prudent expert was selected by following a due diligence process
iii. Give the prudent expert discretion over the assets
iv. Have the prudent expert acknowledge their co-fiduciary status (mutual funds are exempt from this requirement – the prospectus is deemed to serve as the fund's fiduciary acknowledgement).
v. Monitor the activities of the prudent expert to ensure that the expert is performing the agreed upon tasks.

Time Horizon

The investment guidelines are based upon an investment horizon of greater than five years. The Portfolio's strategic asset allocation is also based on this long-term perspective. Short-term liquidity requirements are anticipated to be non-existent, or at least should be covered by cash inflows.

Risk Tolerances

The Committee recognizes that some risk must be assumed in order to achieve the investment objectives of the portfolio. In establishing the risk tolerances of the IPS, the ability to withstand short and intermediate term variability were considered. A 1-yr loss limit of -2.7% has been calculated for the portfolio. Statistically speaking, there is a 2.5% chance that the 1-year return will actually be lower than -2.7%. The portfolio's long time horizon, current financial condition and several other factors suggest collectively
some interim fluctuations in market value and rates of return may be tolerated in order to achieve the longer-term objectives.

Performance Expectations

The desired investment objective is a long-term rate of return on assets that is at least 4.7%. The target rate of return for the Portfolio has been based upon the assumption that future real returns will approximate the long-term rates of return experienced for each asset class in the IPS. The Committee realizes market performance varies and a 4.7% rate of return may not be meaningful during some periods. Accordingly, relative performance benchmarks for the investment options are set forth in the "Monitoring" section.

Duties and Responsibilities
Investment Committee
As fiduciaries under the portfolio, the primary responsibilities of the Committee are:
1. Prepare and maintain this investment policy statement.
2. Prudently diversify the portfolio’s assets to meet an agreed upon risk/return profile.
3. Prudently select investment options.
4. Control and account for all investment, record keeping and administrative expenses associated with the portfolio.
5. Monitor and supervise all service vendors and investment options.
6. Avoid prohibited transactions and conflicts of interest.

Custodian
Custodians are responsible for the safekeeping of the portfolio's assets. The specific duties and responsibilities of the custodian are:
1. Value the holdings.
2. Collect all income and dividends owed to the portfolio.
3. Settle all transactions (buy-sell orders).
4. Provide monthly reports that detail transactions, cash flows, securities held and their current value, and change in value of each security and the overall portfolio since the previous report.

Investment Advisor
The Investment Advisor serves as an objective, third-party professional retained to assist the committee in managing the overall investment process. The Advisor is responsible for guiding the committee through a disciplined and rigorous investment process to enable the committee to meet the fiduciary responsibilities outlined above.

Asset Class Guidelines
The committee believes long-term investment performance, in large part, is primarily a function of asset class mix. Historically while interest-generating investments, such as bonds, have the advantage of relative stability of principal value, they provide little opportunity for real long-term capital growth due to their susceptibility to inflation. On the other hand, equity investments, such as common stocks, clearly have a significantly higher expected return but have the disadvantage of much greater year-by-year variability of return. From an investment decision-making point of view, this year-by-year variability may be worth accepting given the portfolio's long time horizon. Focusing on balancing the risks and rewards of each broad asset class, the following implementation peer groups were selected and ranked in ascending order of "risk" (least to most) according to the most recent quarter's median 3-year Standard Deviation values. The performance expectations (both risk and return) of each broad asset class are contained in Appendix A.

Intermediate-Term Bond
Long-Term Bond
Moderate Allocation
Large Blend
Large Growth

Large Value
Mid-Cap Blend
Foreign Large Blend
Small Blend
Diversified Emerging Mkts

Rebalancing of Strategic Allocation
The percentage allocation to each peer group may vary depending upon market conditions. Please reference the allocation table below for the lower and upper limits for each peer group. When necessary and/or available, cash inflows/outflows will be deployed in a manner consistent with the strategic asset allocation and allocation ranges of the portfolio. If there are no cash flows, the allocation of the portfolio
will be reviewed quarterly. If the committee judges cash flows to be insufficient to bring the portfolio within the target allocation ranges, the committee shall decide whether to effect transactions to bring the allocation of portfolio assets within the threshold ranges.

Peer Group	Strategic Allocation	Lower Limit	Upper Limit
Diversified Emerging Mkts	4%	0%	9%
Foreign Large Blend	15%	10%	20%
Intermediate-Term Bond	9%	4%	14%
Large Blend	16%	11%	21%
Large Growth	18%	13%	23%
Large Value	9%	4%	14%
Long-Term Bond	5%	0%	10%
Mid-Cap Blend	5%	0%	10%
Moderate Allocation	14%	9%	19%
Small Blend	5%	0%	10%

Implementation
Each investment option should be managed by: (i) a bank; (ii) an insurance company; (iii) a registered investment company (mutual fund); or, (iiii) a registered investment adviser. The committee will apply the following due diligence criteria in selecting each money manager or mutual fund.

fi360
fi360 Fiduciary Score Avg (3yr)
Threshold: <= 25 | Pass 3 of the last 4 quarters | Treat missing data values as a failure
*Please reference the fi360 Fiduciary Score Methodology document in Appendix C for additional details.

Expenses
<u>Prospectus Net Exp Ratio (Optional)</u>
Threshold: Top 50% of peer | Pass 3 of the last 4 quarters | Treat missing data values as a failure
Performance
<u>10 Year Return (Optional)</u>

Threshold: Top 50% of peer | Pass 7 of the last 8 quarters | Treat missing data values as a pass
3 Year Return (Optional)
Threshold: Top 50% of peer | Pass 3 of the last 4 quarters | Treat missing data values as a failure
5 Year Return (Optional)
Threshold: Top 50% of peer | Pass 3 of the last 4 quarters | Treat missing data values as a failure

Risk
Standard Deviation (Optional)
Threshold: Top 50% of peer | Pass 3 of the last 4 quarters | Treat missing data values as a failure

Operations
Inception Date (Optional)
Threshold: >= 5 Years | Pass 3 of the last 4 quarters | Treat missing data values as a failure
Manager Tenure (Optional)
Threshold: > 5 Years | Pass 3 of the last 4 quarters | Treat missing data values as a failure

In addition to meeting any required criterion, 5 of the 7 optional criterion must be satisfied to meet the overall Due Diligence Criteria.

Monitoring - Performance Objectives
The committee acknowledges fluctuating rates of return characterize the securities markets, particularly during short-term time periods. Recognizing that short-term fluctuations may cause variations in performance, the committee intends to evaluate investment performance from a long-term perspective. The committee is aware the ongoing review and analysis of the investment options is just as important as the due diligence process. The performance of the investment options will be monitored on an ongoing basis and it is at the committee's discretion to take corrective action by replacing a manager if they deem it appropriate at any time. On a timely basis, but not less than quarterly, the committee will meet to review whether each investment;
specifically: 1. The investment option's adherence to the Watch List Criteria identified below; 2. Material changes in the investment option's organization, investment philosophy and/or personnel; and, 3. Any legal, SEC and/or other regulatory agency proceedings affecting the investment option's organization.

Monitoring - Benchmarks
The Committee has determined that performance benchmarks be established for each investment option. Manager performance will be evaluated in terms of an appropriate market index (e.g. the S&P 500 stock index for large-cap domestic equity manager) and the relevant peer group (e.g. the large-cap growth mutual fund universe for a large-cap growth mutual fund).

Peer Group	Benchmark Index
Diversified Emerging	Mkts MSCI EM NR USD
Foreign Large Blend	MSCI AC World Ex USA NR USD
Intermediate-Term Bond	BarCap US Govt/Credit 5-10 Yr TR USD
Large Blend	Russell 1000 TR USD

Large Growth	Russell 1000 Growth TR USD
Large Value	Russell 1000 Value TR USD
Long-Term Bond	BarCap US Govt/Credit Long TR USD
Mid-Cap Blend	S&P MidCap 400 TR
Moderate Allocation	Morningstar Moderately Aggr Target Risk
Small Blend	Russell 2000 TR USD

Monitoring - Watch List Criteria

The decision to retain or terminate an investment option cannot be made by a formula. Also, extraordinary events do occur that may interfere with the investment option's ability to prudently manage investment assets. It is the committee's confidence in the investment option's ability to perform in the future that ultimately determines the retention of an investment option. An investment option may be placed on a
Watch List and a thorough review and analysis of the investment option may be conducted, when:

fi360

<u>fi360 Fiduciary Score Avg (3yr)</u>
Threshold: <= 25 | Pass 3 of the last 4 quarters | Treat missing data values as a failure
*Please reference the fi360 Fiduciary Score Methodology document in Appendix C for additional details.

Expenses

<u>Prospectus Net Exp Ratio (Optional)</u>
Threshold: Top 50% of peer | Pass 3 of the last 4 quarters | Treat missing data values as a failure

Performance

<u>10 Year Return (Optional)</u>
Threshold: Top 50% of peer | Pass 7 of the last 8 quarters | Treat missing data values as a pass
<u>3 Year Return (Optional)</u>
Threshold: Top 50% of peer | Pass 3 of the last 4 quarters | Treat missing data values as a failure
<u>5 Year Return (Optional)</u>
Threshold: Top 50% of peer | Pass 3 of the last 4 quarters | Treat missing data values as a failure

Risk

<u>Standard Deviation (Optional)</u>
Threshold: Top 50% of peer | Pass 3 of the last 4 quarters | Treat missing data values as a failure

Operations

<u>Inception Date (Optional)</u>
Threshold: >= 5 Years | Pass 3 of the last 4 quarters | Treat missing data values as a failure
<u>Manager Tenure (Optional)</u>
Threshold: > 5 Years | Pass 3 of the last 4 quarters | Treat missing data values as a failure

In addition to meeting any required criterion, 5 of the 7 optional criterion must be satisfied to meet the overall Due Diligence Criteria.

Monitoring - Measuring Costs

The committee will review at least annually all costs associated with the management of the portfolio,
including:

1. Expense ratios of each mutual fund against the appropriate peer group.
2. Administrative Fees; costs to administer the portfolio, including record keeping, custody and trust
services.
3. The proper identification and accounting of all parties receiving soft dollars and/or 12b-1 fees generated by the portfolio.

Investment Policy Review

The committee will review this IPS at least annually to determine whether stated investment objectives are still relevant and the continued feasibility of achieving the same. It is not expected that the IPS will change frequently. In particular, short-term changes in the financial markets should not require adjustments to the
IPS.

Prepared by: Signature
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Name	Position	Signature
Orlando Dixon	President	

Appendix A: Capital Market Inputs

Capital Market Data last updated April 2011. Copyright (c) 2011 New Frontier Advisors, LLC

	Return (%)	Risk(%)	Underlying Index	Peer Group
Large Cap Equity	8.1	16.0	SBBI Large Company Stocks	Large Blend
Mid Cap Equity	8.4	18.0	Russell Mid Cap	Mid-cap Blend
Small Cap Equity	8.7	21.9	SBBI Small Company Stocks	Small Blend
International Equity	8.4	17.7	MSCI EAFE	Foreign Large Blend
Emerging Market Equity	9.2	24.6	MSCI Emerging Markets	Diversified EmerMkts
REITs	7.0	19.3	DJ US Select REIT	Real Estate
High Yield Bond	4.8	8.6	Credit Suisse High Yield Bond	Index High Yield Bond
Long-term Bond	4.1	10.1	Barcap U.S. Long Gov/Credit Bond	Long Term Bond
Intermediate-term Bond	3.5	4.7	Barcap U.S. Interm. Gov/Credit Bond	Intermediate Term
International Bond	3.9	10.8	Citigroup World Gov Bond ex US	World Bond
Commodities	2.0	19.7	Gold, London PM Fix	Precious Metals
Money Market	3.1	1.2	SBBI 30 day US Treasury Bill	Money Market Tax

Analyse the provided Investment policy statement for Sample foundation –MR. What are the major problematic elements that will need to be reviewed? **[17marks]**

[TOTAL 17 MARKS]

QUESTION TWO

You are given the following information pertaining to assets for possible inclusion in a portfolio;

Asset	Expected return	Beta	Specific risk
A	15	1	30
B	12	1.5	20
C	11	2.0	40
D	8	0.8	10
E	9	1.0	20
F	14	1.5	10

Use the Elton –Gruber Model to determine the optimal portfolio assuming no short selling if the risk free rate of return is 5% and the market variance is 10%. [**10marks]**

[TOTAL 10 MARKS]

QUESTION THREE

Suppose that an insurance company offers /sells some Guaranteed Investment Contracts. These contracts basically obligate an insurance company to pay an amount to the buyer determined by :

$A(1+ r)^n$

where A= amount paid by buyer,

r= rate of return in the market and

n = number of years remaining to maturity of contract.

Using appropriate bond portfolio concepts and clear numerical examples , show how a bond portfolio manager will fund the guaranteed investment contracts . Assume a purchase price of \$10000 and the market rate of return is 8%. **[6marks]**

[TOTAL 6 MARKS]

QUESTION FOUR

An insurance company needs to pay \$19 487 in seven years time and the portfolio manager decides to fund the obligation using 3-year zero coupon bonds and perpetuities paying annual coupons. The market interest rate is 10%.

i. Design an adequately immunized portfolio for this obligation. **[4marks]**

ii. Examine your portfolio at the end of year 1, show how you will re-balance the portfolio for it to remain immunized assuming interest rates remain at 10%. **[3marks]**

[TOTAL 7 MARKS]

QUESTION FIVE

You are a bond portfolio manager and your portfolio policy allows for active management strategies, The economic cycle is now expected to mature and inflation is expected to accelerate. The Central bank policy is therefore expected to move towards constraint. Briefly justify the choice amongst each pair of the bonds below: Assume that these bonds were issued in January 2012.

i. Government of Zimbabwe 10% coupon bond due 2017 priced at 98.75 to yield 10.5%. OR Government of Zimbabwe 10% coupon bond due 2022 priced at 91.75 to yield 11.19%. **[3marks]**

ii. ZESA AAA rated 7.5% coupon bond due 2017 priced at 85 to yield 10.1% OR City of Harare Aa rated 7.45% coupon bond due 2017 priced at 75 to yield 12.1%.**[3marks]**

[TOTAL 6 MARKS]

QUESTION SIX

(a) One of the investment managers at Maposa Pension Fund has the following results:

Economic Sector	Portfolio Weight(%)	Benchmark Sector Weight(%)	Portfolio Sector Return(%)	Benchmark Sector Return(%)
Agriculture	6.77	6.45	-0.82	-0.73
Capital Goods	8.52	8.99	-3.28	-4.34
Consumer Goods	36.22	37.36	1.96	1.98
Energy	5.24	4.65	0.44	0.24
Financial	18.53	16.56	2,98	2.22
Technology	14.46	18.87	2.32	-0.48
Utilities	9.22	7.12	0.54	-0.42
Cash & Others	1.04	0	0.17	0
Total	100%	100%	1.34	0.56

i. How much value was created or destroyed by the fund manager? **[6marks]**

ii. Comment on the decisions taken by the fund manager in allocating funds across sectors, show all calculations clearly. **[8marks]**

TOTAL [14 MARKS]

SECTION B [40marks,66mins] `

QUESTION SEVEN

a) Given that interest rates are likely to fall by 1.5% and that Bond A and Bond B have volatilities of 10 and 5 and priced at $70 and $72 respectively. Your portfolio is already holding to 5000 units of Bond C with a volatility of 0.5 and currently priced at $75.
What strategy will you employ to maximize returns from this possible market movement and how much will this strategy generate in the form of profits if Bond C is a strategic asset?
[5marks]

b) Astrix Corporation is a medium-sized producer of chemical products. The firm has 100 retired employees who will receive $1.0 million in retirement benefits next year. These benefits are not indexed to changes in cost of living. For simplicity, assume that benefit payments to retired workers will extend for another 20 years. There are no terminated employees with vested rights. Information about active employees is shown below. Their pension contract does not require that the sponsor provide cost of living adjustments to benefits in retirement.

	Non-invested	Vested
Total employees	100	100
Years in service	5	10
Current salary (per employee)	$2000	$2500
Annual salary growth	5%	5%
Expected years in service	20	20

The current yield to maturity on long-term default and call-free bonds is 6%.

i. Calculate the ABO **[3marks]**
ii. Calculate the PBO **[4marks]**
iii. If the sponsor terminates the plan today, what is the present value loss to employees. **[3marks]**
iv. In Zimbabwe the statutory requirement is that pension schemes should be funded to a minimum of 75%.What are the implications of this requirement? Given an opportunity to review the Acts, what would be your input to this review regarding the funding ratio? **[5marks]**

[TOTAL 20 MARKS]

QUESTION EIGHT

a) You are being interviewed for a job as a portfolio manager at a multi-purpose consulting firm . Part of the interview requires you to demonstrate your ability to develop investment policy statements for the clients listed below:

i. An investment endowment fund that is described as conservative, with investment returns being utilized along with gifts, donations received to meet current expenses, the spending rate is 5% per year, inflation in costs is expected at 8% annually.
ii. A life insurance company that is described as specializing in annuities. Policy premium rates are based on minimum annual accumulation rate of 14% in the first year and 10% minimum annual accumulation rate in the next five years.

For each of the above clients, list and discuss separately the objectives and constraints that will determine the portfolio policy you would recommend. **[6marks;5marks]**

(b) Suppose the stock for XYZ limited is currently trading at 3200 cents. Mr Bin Been expects significant volatility on this stock but is not very sure about the direction of volatility. He buys 2 ATM XYZ limited call options with a strike price of 3200 cents at a premium of 97.90 cents each, sells 1 ITM XYZ call option with a strike price of 3100 cents at a premium of 141.55 cents and sells 1 OTM XYZ call option with a strike price of 3300 cents at a premium of 64 cents.

i. Deduce the motivation of this strategy. **[3marks]**
ii. Evaluate the strategy adopted by Mr Bin Been. Show pay off tables and diagrams. **[6marks]**

[TOTAL 20 MARKS]

<u>QUESTION NINE</u>

(a) Given that Pick and Pay is trading at 4191.10 cents and ITM call options attract a premium of 170.45 cents at a strike price of 4100 cents while an OTM call option on the same underlying asset attracts a premium of 35.40 cents at a strike price of 4400 cents.

i. Show that a Bull – Call Spread will result in a maximum profit of 164.95 cents and maximum loss of 135.05 cents. **[3marks]**
ii. What is the motivation of the strategy in (i) above. **[2marks]**

(b) Use information in the table to answer the questions that follow**.**

Bond	Coupon(%)	Price($)	Maturity(yrs)
A	10	99	1
B	8	92	2
C	15	116	2
D	12	108	3
E	14	115	3
F	7	90	4
G	9	98	4
H	10	99	5

Cash flow commitments for the investor are $ 1m in year 1, $1.1m in year 2 , $1.21m in year 3 and $1.331m in year 4.

i. Construct the least cost portfolio to suit the investor. **[5marks]**
ii. What risks are associated with the portfolio you have constructed in (i)? How would a portfolio manager operating in a market like that of Zimbabwe manage these risks? **[3marks,3marks]**

(d) Coronation Asset Managers are administering a well diversified equities portfolio valued at $50m as at 08 May 2012. The local market is likely to trade bearish in the forthcoming months and the fund managers do not want to be exposed to the bearish trend. The current level of the main index is 5950 and July put and call options are available at 5942 and 5965 respectively. Each index point is worth $25 and premiums on puts and calls are 4.5% and 4% of the index respectively. The beta of the portfolio is 1.05.

Fund managers at Coronation Asset Managers are not in agreement with each other , Fund manager A is arguing for a hedge while Fund Manager B is of the opinion that a hedge is not necessary. The main index falls to 5206 between May and July 2012.

With aid of relevant and clear calculations, show your support for either Fund Manager A or Fund Manager B. **[4marks]**

[TOTAL 20 MARKS]

************END OF EXAMINATION PAPER*********