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Statement of integrity: By typing the names of all group members in the text boxes below, you confirm that the assignment submitted is original work produced by the group (excluding any non-contributing members identified with an “X” above).

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Note: You may be required to provide proof of your outreach to non-contributing members upon request.

N/A

GROUP WORK PROJECT # 1
GROUP NUMBER: 5083

MSCFE 560: FINANCIAL MARKETS

Income stocks

Dataset:

The income stock dataset, sourced from [Kaggle](#), includes three stock types: AAL, BDX, and MYL, with daily closing prices extracted from 2017-2018.

Calculations

The table below shows the Average Returns, Standard Deviation, Skewness, Kurtosis

	AAL	BDX	MYL
Average return	0.001	0.001	0.000
Standard Deviation	0.019	0.011	0.020
Skewness	-0.068	0.537	1.696
Kurtosis	1.129	11.692	14.645

Average return: The table reveals positive average returns for three stock assets, with BDX showing outstanding performance and potentially susceptible to higher volatility.

Standard Deviation: The largest standard deviation indicates more dispersed results, while MYL has the largest STD, suggesting price fluctuations are more likely.

Skewness: AAL's skewness is negligible, suggesting symmetrical returns with balanced tail risks. BDX's positive skewness indicates a few big wins and frequent smaller losses, while MYL's higher positive skewness suggests extreme positive and negative returns.

Kurtosis: BDX's kurtosis is 11.6917, indicating a distribution with heavy tails and more outliers, while AAL's leptokurtic distribution has a kurtosis of 1.1288. MYL's kurtosis is 14.6446, suggesting a distribution with larger tails, potentially indicating severe occurrences or significant price swings.

The table below shows the Correlation Matrix

Correlation Matrix			
	AAL	BDX	MYL
AAL	1.000	-0.012	0.225
BDX	-0.012	1.000	0.107
MYL	0.225	0.107	1.000

The correlation between AAL and BDX is -0.011714, indicating a slight negative correlation. AAL and MYL have a positive correlation (0.225445), suggesting a weak positive linear relationship. BDX and MYL have a weak positive correlation (0.17112), suggesting a slight tendency for their returns to move in the same direction, but the relationship is not strong. Overall, the correlation between AAL, BDX, and MYL is not strong.

The table below shows the Covariance Matrix

Covariance Matrix			
	AAL	BDX	MYL
AAL	0.0003515	-0.0000015	0.0000856
BDX	-0.0000015	0.0001137	0.0000232
MYL	0.0000856	0.0000232	0.0004134

In portfolio theory, covariance is used to determine a portfolio's overall risk (variance). When assets with low or negative covariance are combined, the portfolio's risk can be lower than if each item were held separately. Since the stocks do not often move strongly in tandem, the low correlation values between them imply that owning these companies together may benefit diversification. The low numbers suggest weak ties, therefore the benefits are probably restricted.

1B: Shorting and Credit Risk

Can this portfolio be sold short?

Yes, the stocks within the portfolio can be sold short

If it can be sold, explain the mechanics

- Open a Brokerage account:** Open an account with a broker
- Borrow shares or stock:** Borrow the share you want to short(AAL, BDX, or MYL)
- Sell the borrowed stock:** Sell stock in the open market after borrowing
- Repurchase the borrowed stock:** To cover your shot, you need to buy the stock back to return it to the lender
- Determine the profit difference:** calculate whether you made a profit or loss based on your buying and selling

Does this portfolio have credit risk?

Income stocks generally have lower risk and this can be based on the company's financial health.

Sovereign and Corporate Bond

Dataset: The Data is a 5 years, 10 years and 30 years United State Bond, Curated on weekly basis and was gotten from

Average returns, Standard deviation, Skewness and Kurtosis

	United States 5-Year Bond Yield	United States 10-Year Bond Yield	United States 30-Year Bond Yield
Average	0.015	0.009	0.006
Standard Deviation	0.064	0.050	0.039
Skewness	0.732	0.372	0.372
Kurtosis	1.504	0.425	0.091

Correlation Matrix

Correlation Matrix			
	United States 5-Year Bond Yield	United States 10-Year Bond Yield	United States 30-Year Bond Yield
United States 5-Year Bond Yield	1.000	0.864	0.644
United States 10-Year Bond Yield	0.864	1.000	0.904
United States 30-Year Bond Yield	0.644	0.904	1.000

Covariance Matrix

Covariance Matrix			
	United States 5-Year Bond Yield	United States 10-Year Bond Yield	United States 30-Year Bond Yield
United States 5-Year Bond Yield	0.004	0.003	0.003
United States 10-Year Bond Yield	0.003	0.003	0.002
United States 30-Year Bond Yield	0.003	0.002	0.002

1B: Shorting and Credit Risk

- **Shorting**
 - **Can this portfolio be sold short?**
Yes, this portfolio can be sold short.

○ **If it can be sold short, explain the mechanics.**

Investors may opt to short sell Treasury bond portfolios by borrowing the bonds and selling them at current market prices, with the expectation that the price of these bonds will decrease. This strategy allows the investor to profit by repurchasing the bonds at a reduced price in the future. However, should the bond prices increase, the short seller faces potential losses upon repurchasing the bonds at an elevated price to return them to the lender. This investment tactic necessitates a sophisticated understanding of market dynamics and carries inherent risks, highlighting the importance of comprehensive risk management and market analysis.

● **Credit Risk**

○ **Does this portfolio have credit risk?**

No, this does not carry any credit risk.

○ **If it has credit risk, explain what the credit risk is for your portfolio.**

U.S. Treasury bonds are regarded as among the safest investment options available, reflecting their minimal credit risk due to the robust backing of the U.S. government. Despite economic fluctuations, the likelihood of the U.S. defaulting on these bond payments remains exceedingly low. Consequently, Treasury bonds do not offer additional compensation or yield premiums for credit risk, underscoring their unique position in the financial markets as a virtually risk-free asset.

Technical Report: Cryptocurrencies Portfolio:

Dataset:

The Crypto dataset, sourced from YahooFinance,

For the cryptocurrencies portfolio, we selected three individual assets: Bitcoin (BTC), Ethereum (ETH), and Ripple (XRP). We obtained daily price data for the past 5 years and computed relevant statistics.

The table below shows the Average Returns, Standard Deviation, Skewness, Kurtosis

Currency	Average Return:	Standard Deviation:	Skewness:	Kurtosis:
BTC-USD	0.21% daily return	3.4% daily volatility	-0.3(negatively skewed)	10.2(leptokurtic)
ETH-USD	0.26% daily return	4.5% daily volatility	-0.3(negatively skewed)	8.3(leptokurtic)
XRP-USD	0.18% daily return	5.6% daily volatility	2.4(positively skewed)	30.9(leptokurtic)

The table below shows the Covariance Matrix and Correlation Matix

Currency - comparison	Correlations among Assets:	Covariances among Assets:
BTC-ETH	0.81	0.0012
BTC-XRP	0.56	0.0011
ETH-XRP	0.61	0.00152

Technical Report: Cryptocurrencies Portfolio

Summary of Results:

For the cryptocurrency portfolio, we selected three individual assets: Bitcoin (BTC), Ethereum (ETH), and Ripple (XRP). We obtained daily price data for the past 5 years and computed relevant statistics.

Interpretation of Results:

The cryptocurrency portfolio exhibits varying levels of returns, volatility, skewness, and kurtosis among the selected assets. Ripple and Ethereum have higher volatility compared to Bitcoin. Positive correlations among assets suggest some degree of co-movement, indicating potential diversification benefits, although these correlations are relatively high.

Recommended Course of Action:

Given the high volatility and positive correlations among assets, investors may consider diversifying across different cryptocurrencies to mitigate risk. Additionally, active risk management strategies, such as setting stop-loss orders, can help protect against downside risk.

Non-Technical Report: Cryptocurrencies Portfolio

Explanation of Results:

In our cryptocurrencies portfolio, we chose Bitcoin, Ethereum, and Ripple. These assets have shown different levels of returns and volatility over the past 5 years. Ripple and Ethereum have higher volatility compared to Bitcoin, which indicates they are more prone to price fluctuations.

Recommended Course of Action:

Diversification across different cryptocurrencies can help mitigate risk, but it's crucial to conduct thorough research and understand the unique characteristics of each asset.

Identification of Factors Impacting the Portfolio:

Factors such as market sentiment, regulatory developments, and technological advancements can significantly impact the performance of cryptocurrencies. Additionally, the interconnectedness of the crypto market and the lack of regulation can contribute to increased volatility and risk.

Conclusion:

Investing in cryptocurrencies can offer opportunities for high returns but comes with inherent risks. It's essential for investors to approach this asset class with caution, conduct proper due diligence, and consider their risk tolerance before investing.

1B: Shorting and Credit Risk

1) SHORTING - Can this portfolio be sold short? Yes, the Crypto Currency portfolio can be sold short.

The mechanics of shorting this portfolio involve -

- a. **Borrow Cryptocurrency:** from a brokerage or exchange that allows margin trading and short selling.
- b. **Sell Borrowed Cryptocurrency:** Sell the borrowed cryptocurrency at the current market price.
- c. **Wait for Price Drop:** Wait for the cryptocurrency's price to drop as anticipated.
- d. **Buy Back Cryptocurrency:** Buy back the same amount of the cryptocurrency at a lower price.
- e. **Return the Borrowed Cryptocurrency:** Return the borrowed cryptocurrency to the lender.
- f. **Profit from the Difference:** The profit is the difference between the selling price and the buyback price, minus any fees or interest charged by the brokerage or exchange for the loan of the cryptocurrency.

2) CREDIT RISK - Does this portfolio have credit risk? Yes, the Crypto portfolio does carry credit risk.

The portfolio comprising Bitcoin, Ethereum, and Ripple is subject to specific forms of credit risk unique to cryptocurrencies. These include

- a. Exchange risk pertains to the potential financial losses stemming from the insolvency or lack of security of the platform where assets are held.
- b. Counterparty risk arises in scenarios such as margin trading or short selling, characterized by the possibility that the borrowing party may not fulfill its obligations.
- c. Regulatory risk captures the effect of legislative changes on the value and tradability of assets.
- d. Lastly, liquidity risk impacts the ability to carry out trades without causing significant price movements. Effective management and strategic planning are essential in mitigating these risks to safeguard investments.

FTX COLLAPSE INTERVIEW

Journalist: The FTX collapse underscores risks in the growing, yet largely unregulated, crypto sector (Davis). I am interviewing a technical specialist and a risk management expert about tightening oversight following this crisis while balancing innovation. As cryptocurrencies rapidly gain popularity, the implosion of a top exchange like FTX exposes the industry's common opacity and lack of accountability (Davis). We will examine failures at FTX and whether more guardrails could have prevented alleged fraud and customer fund abuse. Understanding precisely what went wrong is key as policymakers weigh prudent crypto regulation that spurs responsible growth.

Journalist: We will kick off the interview with the technical specialist, let's begin with the first question. Could you summarize what financial regulations covered or should have covered FTX's activities?

Technical Specialist: FTX stated they regulate crypto trading on their platform through methods like two-factor authentication for account access and withdrawals, real-time anti-money laundering monitoring of user behavior, know-your-customer identity verification, customizable subaccount permissions, and a \$200 million emergency fund to cover losses from issues like security breaches.

Journalist: What types of operations were existing policies meant to oversee?

Technical Specialist: Specifically, they require extra login codes and lock withdrawals if passwords or codes change. They also scan for suspicious deposits and activities, mandate ID confirmation for trading/transfers, enable users to open accounts with adjustable authorization and withdrawal rights and claim their backstop liquidity reserves will reimburse users after widespread platform disruptions or wallet hacks (Smith).

Journalist: To risk management expert. In your opinion, how much did greed, dishonesty, or carelessness play into FTX going under?

Risk Management Expert: Determining the exact mix of greed, dishonesty, and carelessness in FTX's failure is complex due to ongoing legal scrutiny. Allegations involve fraud, such as FTX's token manipulation and misuse of customer funds. The centralized control by Bankman-Fried lacked proper oversight, contributing to the crisis.

Journalist: Were there policy loopholes enabling FTX to evade regulatory monitoring? Should crypto trading platforms have distinct governance from mainstream finance?

Technical Specialist: Traditional finance fuels people, groups, and governments to generate, keep, transfer, and employ money to benefit the economy and community. Cryptocurrency trading lacks those aims so is not considered true finance. The FTX failure shows that for security and innovation, balanced rules allowing both safeguards and creativity are key. Ultimately, countries will benefit from a nimble system that can track who trades and why. (Berwick)

Journalist: What red flags could regulators and investors have spotted but potentially overlooked?

Risk Management Expert: There were regulatory warnings against FTX, such as a cease and desist order from a US bank regulator for making "false and misleading" claims about deposit insurance, which hinted at operational and ethical issues within the company (Al Jazeera).

Journalist: It has been said that FTX utilized client funds to support its sister company Alameda Research. What regulations could have stopped or reduced this misuse of customer assets? What protections should have been in place to prevent it?

Technical Specialist: FTX's reported use of customer assets to support Alameda Research reveals gaps in oversight and protections. Segregating user funds, mandating transparency, enforcing current finance rules, and requiring strict audits for regulatory compliance could have mitigated misusing client investments in this way. Weak supervision enabled customer money to prop up FTX's sister entity, risking assets meant solely for trading purposes. (Handagama)

Journalist: Could tighter crypto oversight have possible drawbacks or accidental outcomes? How can we strike a balance between allowing the crypto field to keep innovating while still instituting suitable safeguards against risk?

Technical Specialist: Banning cryptocurrency could hamper beneficial blockchain progress. Reasonable rules should legitimize the field and curb bad players instead. Singapore's crypto oversight balances innovation and governance - a model for other nations to enable both as well. Discovering this regulation/innovation equilibrium can benefit regulators and crypto companies alike. (Chor)

Journalist: How might the cryptocurrency sector enhance risk control procedures and ethical norms?

Risk Management Expert: Cryptocurrency entities should rigorously adhere to existing financial regulations and prepare for compliance with emerging ones. This includes Anti-Money Laundering (AML) and Know Your Customer (KYC) policies, securities regulations, and any country-specific regulations affecting their operations.

Journalist: What core problems does the FTX failure highlight regarding crypto trading platforms and financial advancement overall?

Risk Management Expert: The FTX collapse highlights three main issues: the need for stronger regulations, systemic risks in the crypto industry, and the importance of ethical governance and risk management to maintain investor trust and market integrity.(Wagner)

Journalist: And that marked the end of our interview. A very big thank you to our technical specialist and risk management expert. To those who are tuning in, thank you for your kind attention!

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