Portfolio Management Class

UniRemington Two Hour Virtual Investment Workout

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Note: Simulation software for this class is available by clicking on this link: https://jcwestland.shinyapps.io/virtual_invest_class/

Welcome to the **Portfolio Management Class**, an immersive, interactive simulation designed to replicate the dynamics of financial portfolio management. This two-hour virtual class, conducted asynchronously online in a challenge structure similar to many popular videogames, combines real-world investment decision-making with simulation-based exercises. Using a custom Shiny app, students will manage a portfolio of five securities, adjusting their holdings based on weekly market events and historical price data. The goal is to maximize portfolio value through strategic buying and selling of securities, with performance graded on a curve from A to F.

This engaging workout helps participants sharpen their financial acumen by analyzing market trends, responding to world events, and making investment decisions in real-time.

Class Structure

Total Duration: 2 Hours

Platform: Software for portfolio management simulation featuring a single screen with graphs of securities values, and controls for making investment choices)
Rounds: 6 rounds (each simulating one week), culminating in a reflection and grading session – all conducted asynchronously. This structure may, in specific situations, may be facilitated synchronously by the instructor/facilitator using Zoom to provide an environment with more direct feedback.

Challenge Structure for Portfolio Management Class

This challenge-based module is designed to help you apply portfolio management concepts in a dynamic, real-world simulation. Please carefully read the following instructions to ensure you are fully prepared for the experience. These details outline the structure, expectations, and innovative aspects of the class to support your success.

1. Entirely Online Format

This class is conducted entirely online, providing students with maximum flexibility to participate from anywhere. The only requirement is a stable internet connection and a computer capable of loading the simulation interface. The class is designed to fit around their schedule, offering students the freedom to begin whenever it is convenient within the week.

Once the session begins, however, students are required to complete the entire 2-hour module in one continuous sitting. This creates a focused, immersive environment where students can dedicate your full attention to managing and growing their virtual portfolio.

2. Flexible Start Time with a Single Sitting Requirement

students may initiate the challenge at any point during the assigned week. This gives students control over when students start, whether it's early in the morning, late at night, or over the weekend. However, once students click the start link, the clock begins, and students must complete the session in one sitting. This structure mirrors real-world trading, where decisions must be made under time constraints, enhancing their ability to think quickly and strategically.

3. Accessing the Class: Email Link and Cloud Hosting

To begin the class, each student will receive an email containing a unique link. When clicked, this link will direct students to the class interface, which is hosted on a cloud computing server using Shiny, a powerful platform for building interactive web applications. The class screen will automatically load on studentsr device, so make sure studentsr system is ready for the session when students click the link.

This cloud-hosted system allows for seamless access, ensuring that students experience no issues with installing software or managing files on their local machines. All interaction occurs through the web interface, making it as simple and user-friendly as possible.

4. Timer System and Round Structure

To keep students informed and on track, the screen will feature two essential timers in the lower-left corner:

- The **elapsed time timer** will continuously display how much time has passed since students began the session. This helps students manage their time during the entire 2-hour class.
- The **round countdown timer** will track the time remaining in each individual round of play. There are six 10-minute rounds, and the countdown ensures students are aware of how much time students have to complete decisions and actions within each round.

Each round focuses on decision-making in portfolio management, where students will buy, sell, and adjust your holdings based on a simulated market. After every round, students will have **5 minutes of reflection** to review your actions and think about potential improvements before the next round begins.

5. Grading: Round-Based and Comprehensive Evaluation

At the end of each 10-minute round, their performance will be assessed, and students will receive a **Letter Grade**. This grade is determined by several factors:

- The **total portfolio value** after the round.
- The **gains or losses** from theri trading and portfolio management decisions.

This immediate feedback helps students understand how well students are performing, giving you the chance to adjust your strategy for subsequent rounds. At the end of the 2-hour session, a **comprehensive grade** will be calculated based on their performance across all six rounds. This final grade reflects their overall management skills during the challenge.

6. Innovative Leaderboard System

A key feature of the class is the **leaderboard**, which adds an element of competition and comparison. The leaderboard is a public web page that displays the performance of all students who have completed the challenge. This innovative feature fosters a sense of community by allowing students to see how your performance compares with others.

The leaderboard will display:

- Their **Letter Grade** for each round.
- The **total portfolio value** students achieved in each round.
- Their **gains or losses** from trading.

Their name on the leaderboard may be anonymized depending on the instructor's decision. This allows for the possibility of either competitive transparency or privacy, depending on class dynamics.

The leaderboard will be updated in real-time, giving students constant access to their ranking and that of their peers. This constant, comparative feedback system helps motivate students to improve their trading strategies as they progress through the challenge.

7. Final Grade Determination and Ranking Curve

At the end of the challenge, the leaderboard not only reflects their performance but also influences their final grade. Their rank relative to other students on the leaderboard will serve as a grading curve, providing an additional layer of assessment. The higher students rank in terms of portfolio gains, the better their final grade will be.

This system ensures that grading is competitive yet fair, rewarding those who perform well in managing their portfolios while also providing clear benchmarks for improvement. The class aims to encourage students to develop stronger portfolio management strategies over time by learning from their performance and comparing it to others.

8. Conclusion and Takeaways

The Portfolio Management Class at UniRemington is an exciting, engaging challenge designed to help students apply theoretical knowledge in a practical, real-world context. The online format and competitive structure create a stimulating learning environment where students can hone their skills in portfolio management, decision-making under pressure, and financial strategy.

By the end of the module, students will have a clear understanding of how to manage a portfolio, how different financial events impact your trading decisions, and how to measure your performance relative to others. The leaderboard feature also adds a dynamic competitive edge, helping students to stay motivated and aware of their progress.

Objective

The primary goal of this session is to simulate real-world investment decision-making in a dynamic market environment. Students will analyze market trends, consider the influence of external events on their portfolio, and strategize on how to maximize portfolio value. Each decision will reflect how well students understand the interplay between past events, historical price data, and market uncertainty.

Agenda

1. Introduction (10 minutes)

- **Session Overview**: The instructor will introduce the virtual workout and its objectives.
- **How the Simulation Works**: Explanation of the relationship between price history, external events, and security prices. Students will understand how past events and trends can influence future price movements, but with some level of unpredictability due to the random component of securities prices.
- **Software Setup**: Ensure all participants are logged into the Shiny interface, where they will manage their portfolios. Each student begins with $100,000 in cash, zero holdings of any security, and access to the price history of the five securities over the past year.

2. Challenge Rounds (6 rounds, 15 minutes each)

Each round represents **one week** of simulated time. In each round, participants will be presented with a series of events that impact their securities, requiring them to buy or sell shares to maximize their portfolio value.

What Happens in Each Round:

- **Random Event Presentation (1 minute)**: Each round begins with the presentation of up to 5 events randomly drawn from a pool of 100 potential events. These events affect a subset of securities, and each student must analyze their potential impact. Events range from "Oil Price Surge" to "Federal Reserve Interest Rate Hike" and will have varying impacts on securities based on relevance to their industry.
- **Securities Affected**: The events impact specific securities in different ways. For example, a crisis in oil-producing countries will negatively affect Global Oil, while a tech boom will positively influence Tech Giant.
- **Graph Display**: The Shiny app will show the updated price history of the five securities over the past year, including notations for significant events. Participants will see how the securities' prices have evolved and how the new events might shape future price movements.
- **10-Minute Active Play**: During this period, students will use the Shiny app's sliders to buy or sell shares of the five securities. They must decide the optimal amount to invest in or divest from each security based on their analysis of the events and price trends.
  - **Buy and Sell Constraints**: Students can buy shares of securities as long as they have cash available. If their cash runs out, they can borrow money at a 10% annual interest rate (calculated weekly). Borrowing too much without sufficient returns can lead to losses.

- **Impact on Cash**: Any profits or losses from each round will be added or subtracted from the cash available. Borrowing will accrue weekly interest, automatically deducted from their cash.

- **5-Minute Reflection & Strategy Session**: After each round, students will reflect on their decisions and strategize for the next round.
  - **Questions to Consider**:
    * What was the impact of the events on your securities?
    * Did the historical price trends influence your decision-making?
    * How do you plan to adjust your strategy in the next round?
    * What worked, what didn't?

  This reflection is crucial for understanding how market trends and external events shape investment outcomes.

Sample Round Breakdown

Round 1 (15 minutes):

- **Event 1**: Market crash in the technology sector.
- **Event 2**: Unexpected Federal Reserve interest rate increase.
- **Event 3**: Major pharmaceutical breakthrough.
- **Event 4**: Oil price surge.
- **Event 5**: Retail industry supply chain disruption.

Impact on Securities:

- Technology stocks drop due to the market crash.
- Healthcare stocks surge due to the pharmaceutical breakthrough.
- Oil and gas stocks rise following the oil price surge.
- Retail stocks face negative impacts due to supply chain issues.

Participant Actions:

- Adjust holdings in response to these events (e.g., sell Tech Giant shares, buy Global Oil).
- Analyze how each event impacted their securities and strategize for the next round.

Final 15 Minutes: Reflection, Evaluation & Grading

Collective Reflection:

After the final round, participants will engage in a group discussion about their strategies and outcomes.

- **Key Questions**:
  - What strategies were most effective in maximizing portfolio value?
  - How did different events impact your decision-making?
  - What patterns did you observe in your portfolio growth?
  - What did you learn from other participants' approaches?

Automatic Grading System (Shiny App):

The Shiny app will automatically generate a grade based on participants' overall performance during the simulation.

- **Primary Grading Metric**: Total portfolio value at the end of the simulation.
- **Secondary Metrics**:
  - **Risk Management**: Participants who avoided excessive borrowing or large losses will score higher.
  - **Strategic Consistency**: Extra points will be awarded for participants who progressively built their portfolio value over the rounds.
  - **Response to Events**: Students who made timely and effective portfolio adjustments in response to events will be rewarded.
  - **Diversity of Investments**: Maintaining a well-diversified portfolio will be encouraged.

Simulation Features

Real-Time Price Simulation:

The Shiny app models securities prices in real-time, using a **log-normal distribution** with random fluctuations. Each security's price is influenced by the following factors:

- **Historical Price Trends**: Past price movements affect current prices. For example, if a security has seen a rise in prices for several consecutive weeks, there's a higher chance it will continue to rise.
- **External Events**: Randomly drawn events (e.g., oil price spikes, tech breakthroughs) affect securities based on relevance to their industry. For example, Global Oil is impacted by oil price changes, while Tech Giant is affected by cybersecurity breaches.
- **Circuit Breakers**: Securities prices cannot change more than 15% in one week, or a market circuit breaker will stop trading and freeze that price. This reflects reality and also prevents good investment decisions from being undermined by randomness.
- **Events:** When an event occurs, it has a positive or negative effect on each of the 5 securities prices, depending on which industry sector they are in. This effect has a random component, so the event effect is not absolute, but approximate.
- **Trends:** Current securities prices are influenced by historical trends; e.g., if a stocks price has been rising in the past 5 periods, it is likely (but not certain) to rise in the next period. Again, this is not absolute, but has a large random component mimicking reality.
- **Random Component**: While past events and trends influence future prices, there is always a random element in the simulation to reflect real-world market unpredictability.
- **Borrowing Limit**: Students can borrow cash on the margin, with securities they own pledged as collateral, but only up to 50% of their **total portfolio value** (including cash and securities).
- **Borrowing Enforcement**: If a student's total borrowing exceeds this limit, borrowing will be capped at the 50% threshold.

This update ensures that borrowing is constrained by the value of the student's portfolio, preventing over-leveraging and preventing reckless financial decision-making within the simulation.

Event Impact Calculator:

Each week, the app draws **up to 5 events** from a pool of 100 possible events. These events affect security prices by specific percentages over the next 10 weeks. The events are displayed alongside the price charts for the 5 securities, and their effects on prices are simulated in real-time.

Interactive Interface:

- **Sliders**: Participants use sliders to increase or decrease their investments in each security. This allows for intuitive, hands-on decision-making.
- **Real-Time Updates**: As students adjust their portfolios, the system recalculates the portfolio's value in real-time, showing immediate feedback on decisions.
- **Event Notations on Graphs**: Each security's price history will show event markers, making it easy for participants to see how past events influenced price trends.

Portfolio Summary:

The **Portfolio Summary** section dynamically updates to show:

- **Net Portfolio Value**: The total value of the portfolio, including securities, cash, and borrowed amounts.
- **Cash Available**: The remaining cash after buying or selling securities.
- **Borrowed Cash**: Amount borrowed with 10% annual interest.
- **Weekly Increase**: The change in portfolio value for the current round.
- **Cumulative Grade**: A letter grade (A to F) based on overall portfolio performance.

Final Thoughts

The **Portfolio Management Class** provides participants with an engaging and dynamic learning experience. By simulating a real-world investment environment, participants can develop a deep understanding of how external events, market trends, and strategic decision-making can affect portfolio performance. The combination of interactive tools, real-time feedback, and reflective exercises prepares students for managing market volatility in a professional setting.