Group members: 1)……..

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Final exam

Fall-Winter 2024
HEC Lausanne

Market Microstructure

Professor Roxana Mihet

Rules:

1. Work in a group of 2-3 students. You can keep your old group or form a new group.
2. Type up your answers in this PDF file (you can append other files, such as an Excel file or a picture to this PDF file). You can also print this document out and write in the spaces provided and then scan your answers, or you can fill in the PDF document directly.
3. Submit your work by the deadline: Jan 19th, 2025 at 11:59 pm.
4. No late submissions will be accepted.
5. The final exam grade will be curved.

Disclaimer: In submitting this final exam, all the members in your group affirm that this exam represents your own work, without the use of any unpermitted aids or resources. You agree that you understand that there will no tolerance towards academic dishonesty, and that cheating can and will lead to automatic failure from the class as well as a report to the Academic Integrity Committee.

Part I (40 points)

True, false or uncertain? **[Explain in less than 8 lines of text (normal font 12 or 14). Only the first 8 lines will be read and graded.]**

1. Asymmetric information cannot explain asset trade.

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2. If markets are efficient, then stock prices reveal all publicly available information.

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3. The higher the number of informed traders, the lower the bid-ask spread.

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4. We measure liquidity in the stock market by the magnitude of how much transaction prices deviate from the mid-point of the bid-ask spread.

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5. The relative spread is the ratio between the absolute bid-ask spread and the mid-point

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6. In perfectly competitive markets, the profits of a dealer must be strictly positive, otherwise no dealer would be present in the market.

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7. The compass rose of the stock market shows that one cannot exploit the market to make a profit.

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8. We can always identify insider trading after the fact by examining the trade-price record immediately prior to an information release.

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9. We can think of the “economics of information” much like the “economics of agriculture”.

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10. Stocks held by more investors are more closely followed by all the shareholders.

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Long Question I: COSINE Similarity
(60 points)

1. **Cosine Similarity Analysis**:
    a. Select a sample of 10 firms from a given industry (e.g., tech, pharmaceuticals, or financial services).
    b. Calculate the **cosine similarity** between the business descriptions of firms in the sample for the most recent 10-K filings.
2. **Analysis & Interpretation**:
    a. Identify pairs of firms that have **high cosine similarity** in their business descriptions.
    b. Identify pairs of firms that have **low cosine similarity** in their business descriptions.
3. **Discussion Questions**:
    a. **(Market Microstructure Insight 1)**: How might the similarity (or dissimilarity) in business descriptions relate to the nature of competition and product market rivalry in this industry? Relate this to the concepts of **adverse selection** and **informed trading**.
    b. **(Market Microstructure Insight 2)**: If two firms have high cosine similarity in their business descriptions, how might this affect their sensitivity to **common shocks** in the market? How does this relate to **risk sharing**and **information contagion**?
    c. **(Information Frictions Insight)**: Consider the **Grossman-Stiglitz Paradox**. If all firms in an industry had identical business descriptions, would traders have any incentive to acquire costly private information? How does the variation in cosine similarity support (or contradict) this theoretical idea?
    d. **(Empirical Test Idea)**: Propose a way to use the cosine similarity of firms' business descriptions as an independent variable in a regression to predict **trading volume around earnings announcements**. What hypothesis would you test, and how would you interpret the coefficients?

Grading Criteria:

- Correct and clear methodology for computing cosine similarity.
- Depth of analysis in responding to discussion questions, especially linking results to market microstructure theory.
- Creativity and originality in answering the **empirical test idea**.

Submission Format: PDF or Jupyter Notebook.