Understand the five belief perseverance biases, consequences and detection:

- **Conservatism –** failure to incorporate new info after a view is established
- **Confirmation –** selectively seeking information that confirms a prior view
- **Representativeness –** tendency to make decisions based on stereotypes or patterns
- **Illusion of control –** belief of ability to influence uncontrollable events
- **Hindsight –** overestimate "ex-post" the accuracy of forecasts

Understand the four processing error biases, consequences and detection:

- **Anchoring and adjustment –** similar to conservatism but is usually tested as an under reaction to new information rather than avoidance of new info or no reaction at all
- **Mental Accounting –** often tested as investors dividing total assets into 'buckets' based on categories (i.e. leisure, necessities, emergency)
- **Framing –** tendency to respond differently depending on the situation
- **Availability –** tendency to overestimate the possibility of an outcome based on ease of which the outcome comes to mind (know the four sources of availability bias)

Types of emotional biases:

- **Loss aversion –** includes house money effect and myopic loss aversion, tendency to treat investments differently depending on whether it is a loss or a gain
- **Overconfidence –** tendency to overestimate own ability or knowledge
- **Self control –** preference for present consumption (certainty) versus future (uncertainty)
- **Status quo –** avoidance of change
- **Endowment bias –** emotional attachment to an asset or investment
- **Regret aversion –** avoidance of decision due to fear of regret

定義複習第二遍

Cognitive --five belief perseverance biases

Conservatism	
Definition	• Believe what you originally believe. • Place *less value* in *new information*. • Relate "new" information to "old" information. • In Bayesian term, investor *overweight the base rate* and under react to new information.
Impact	• *Slow to react* new information. • Tendency to *hold* winners or *losers* too long.
Mitigation	• Should *look* carefully on *new data*. • Seek professional advice.
Diagnostic Question	Assume you make an investment based on your own research . An adviser presents you with new information that contradicts your belief about this investment. How would you respond?

Cognitive Error --five belief perseverance biases

Confirmation

Definition	• Believe what you *want to believe*; • Notice information that agrees with their original forecast, *focus on positive, avoid negative*.
Impact	• *Reject evidence* that does not support the investment; • Too much *confidence* in the investment; • Lead to *under-divers*ified portfolio; • Lead to overweight *employer's stock;*
Mitigation	• Seek out both confirming and *contradicting* information; • Use *more* than one method of analysis.
Diagnostic Question	Suppose you make an investment based on your own research. The investment doesn't more up as much as you thought it might. How you likely to respond?

確認偏差confirmatory bias
- 確認偏差：人們一旦形成一個較強的信念，他們就會有意識地尋找有利於證實自身信念的各種證據，不再關注那些否定該信念的證據，並人為地扭曲新的資訊。比如女生買衣服和對自己中意的男（女）朋友的一見鍾情。
- 確認偏差會使得投資者堅持錯誤的交易策略，導致定價錯誤的持續存在，直至非常強而有力的證據出現才能迫使改變原有的信念。

Cognitive Error --five belief perseverance biases

Representativeness

Definition	• Believe what your *own interpretation* and classification • Classify information using *heuristic* • *If-then classification* of information into category: (1) *base rate neglect*; or (2) *sample size neglect*
Impact	• Too much focus on new information; • Change strategy based on a small sample of information; • May classify information into incorrect category.
Mitigation	• Consider *true possibility* that information fits a category • Use Periodic Table of Investment return as a reference for asset classification;
Diagnostic Question	Have you ever made a new investment because of its apparent similarity to a past successful investment (e.g., a tech stock or value stock) without doing research to validate the new investment's merits?

Fallacy (Representativeness Bias)

Conjunction Fallacy	The probability of conjunction is never greater than the probability of its conjuncts; e.g., On early Sept, prob (stock down in Sept.) = 0.55 , prob (stock down in the next 12 months) = 0.7 Do you like to BUY?
Gambler's Fallacy	If-then heuristic of mean-reversion; e.g., this stock has down for 7 quarters, the chance of price up should be higher than that of price down.
Halo Effect	The company with a good record of growth and past performance is a good investment.

定義複習第二遍

Cognitive Errors --five belief perseverance biases

Illusion of Control

Definition	• Believe what you can ***control over*** investment ***outcomes.*** • Increasing ***subjective*** probability of personal success.
Impact	• ***Excess*** Trading and costs; • ***Concentrated*** portfolio.
Mitigation	• Know the ***complexity*** of investing; • Seek ***others' opinions***; • Keep ***trading records*** to see whether or not you can control investment outcomes.
Diagnostic Question	You are offered two free lottery tickets. You may either select your own numbers or have a machine do it. What would you do?

Cognitive Error s --five belief perseverance biases

Hindsight

Definition	• Believe you "knew" the outcomes **before** they happened; • Individuals perceive **outcomes** (past events) as reasonable and **expected;** • "This is what happened; this is why happened".
Impact	• Take too much risk of investment because of **false sense** of confidence.
Mitigation	• Keep record of all forecast and see how accurate these forecasts were? • Investment managers must be evaluated relative to appropriate benchmark.
Diagnostic Question	Do you believe your investment outcomes are generally predictable or unpredictable?

後見之明（**hind-sight**）-- 後見之明：後見判斷（得益於事件結果回饋的判斷）與先見判斷（不知曉事件結果時的判斷）的系統差異。
　即我們常說的事後諸葛亮：每當一個事件發生之後，他們總能找到若干理由，證明這一事件必然發生，覺得自己"早就知道"某一事件（如球賽、婚姻、選舉等）會出現何種結果.? 事實上，每個人都或多或少地存在此類心理偏向。

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Cognitive Errors – four information Process biases

Anchoring & Adjustment

Definition	• Decision is influenced by the **reference point** of value set by your first believe; e.g., anchor to expected price.
Impact	• Investors tend to remain focused on and **stay** close to their **original forecasts**. • May take **excess risk** and **miss opportunity**.
Mitigation	• Must consider **new information**. • Put **less weight** to old information.
Diagnostic Question	You purchase a stock at $50 per share. It goes up to $60 in a few months, and it drops to $40 a few months later. You are uncertain what will happen next. How would you respond to this scenario?

錨定與調整啟發法
1）定義 -- 在判斷過程中，人們通常會根據最初得到的資訊設定一個判斷的初始值（錨點，參考點），然後根據進一步獲得的資訊進行調整，形成比較理想的判斷。
2）錨定與調整可能導致的偏差 -- 調整不充分："價格粘性"，"貨幣幻覺"傾向于高估複雜系統成功的概率和低估其失敗的概率。

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Cognitive Errors – four information Process biases

Mental Accounting	
Definition	• Decision is influenced by investors' *mental classification* of assets.
Impact	• *Ignoring correlation* among assets. Less risk-diversification. • May take too much *risk* by searching for high *current income* investment.
Mitigation	• Examine *all investments* as if they are parts of the same portfolio. • Analyze heir *correlations.* • *Total return* consideration.
Diagnostic Question	Generally, do you categorize your money by different financial goals, or do you look at the bigger financial picture?

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Framing	
Definition	• Decision is influenced by how the question or *presentation of information* is provided.
Impact	• May *incorrectly identify risk* of investments and have *suboptimal asset allocation*. This is because that *risk aversion or loss aversion* is affected by how information is framed.
Mitigation	• Focus on *expected return and risk* rather than on gains or losses.
Diagnostic Question	Assume you have agreed to a financial plan created by your adviser that has a projected return of 9% and an annual standard deviation of ±15% (a typical plan). Would it surprise you to know that statistically in the worst case, the plan's return could be negative 36% or more in one year out of 100? Would this information cause you to rethink your risk tolerance?

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