

UNDERSTANDING RISK I: DEFINING AND MEASURING RISK

A Double-edged Sword?

WHAT IS RISK?

- Risk, in traditional terms, is **viewed as a ‘negative’**. Webster’s dictionary, for instance, defines risk as “exposing to danger or hazard”. The Chinese symbols for risk, reproduced below, give a much better description of risk:

危機

- The first symbol is the **symbol for “danger”**, while the second is the **symbol for “opportunity”**, making risk a mix of danger and opportunity.
- Put simply, the risk and return trade off on investing requires you to **evaluate how much danger there is an investment and demand enough opportunity** to compensate you for exposing yourself to danger.

DIMENSIONS OF RISK

- **Price risk versus cash flow risk:** When you buy stocks, your risk can come from
 - **Variability in the stock price:** Not only do you implicitly feel this risk (watching your holdings go up and down in value) but you are explicitly exposed, if you have to sell the stock.
 - **Variability in cash flows:** In the strictest measure, this can be variability in dividends. More generally, it can reflect variability in the underlying earnings/cashflows.
- **Total risk versus downside risk:** You can measure risk as deviation from expectations in both directions (better & worse than expected) or just worse than expected.
- **Stand alone risk versus portfolio risk:** You can measure risk in a stock, as a stand-alone investment or as risk added to a portfolio of stocks.

THE RISK/RETURN STARTING POINT

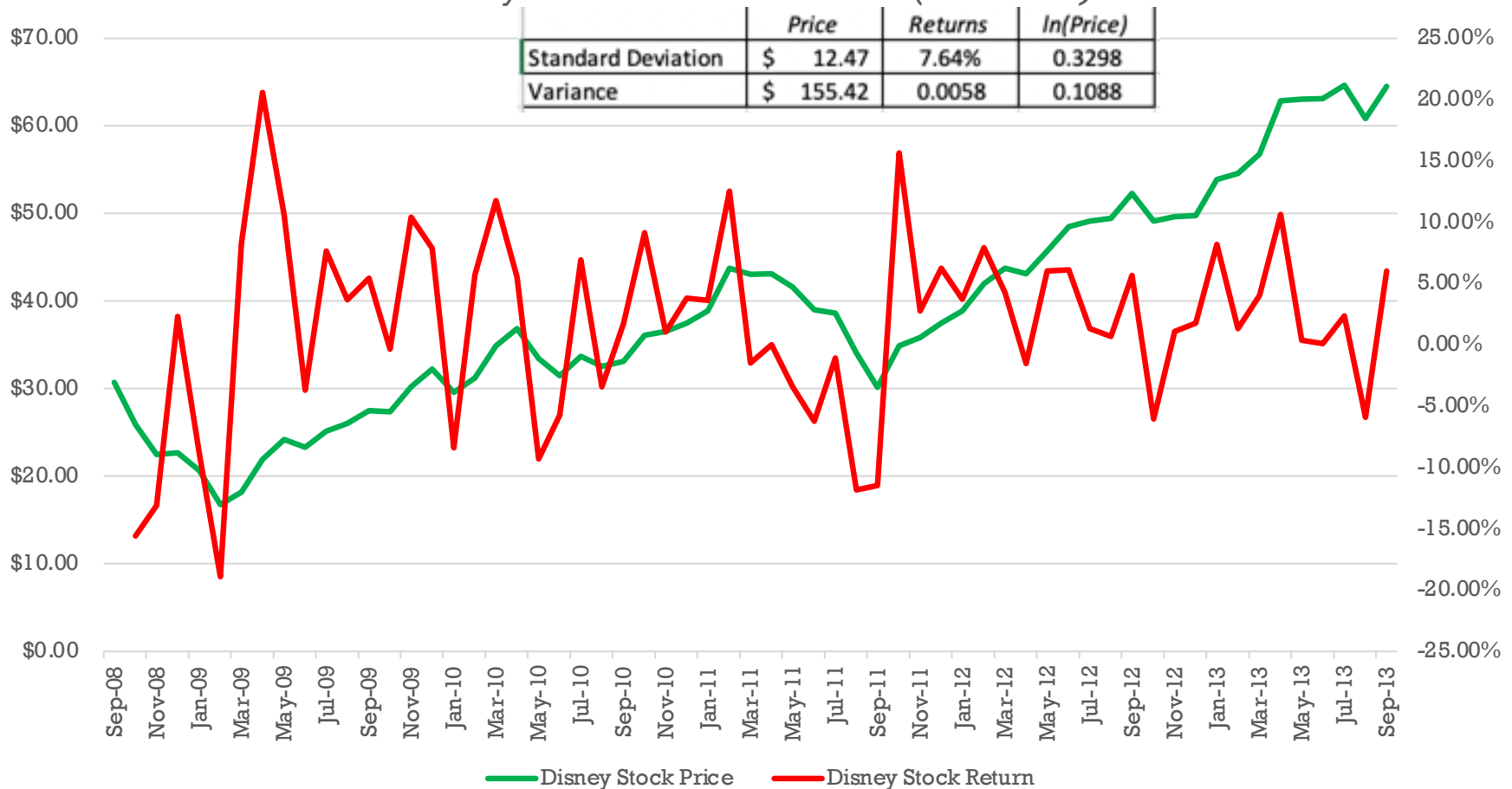
- **Proposition 1: No risk, no return.** If you don't expose yourself to risk, you should not expect to earn a return higher than what you would make on a riskfree investment.
 - The Arbitrage Clause: If you can find a riskless investment on which you can earn more than the riskless rate, you have found an arbitrage position.
- **Proposition 2: In an efficient market, your expected return will rise only if you expose yourself to more risk.** There will be no free lunches.
 - The Beat the Market hope: If you can find inefficiencies, you may be able to exploit them to earn an expected return that is higher than what you should have given your risk exposure.

MEASURING PRICE RISK

- The **simplest measure of price risk is the volatility in the price**, computed as a standard deviation or a variance.
- Since high priced assets will have higher price standard deviation than low priced assets, the **volatility is usually standardized by looking at the returns on the asset**.
 - The returns on an asset comes **from price change during a period and any cash flows that are paid on it**.
 - They are in **percentage terms and thus comparable across assets with different price levels**.

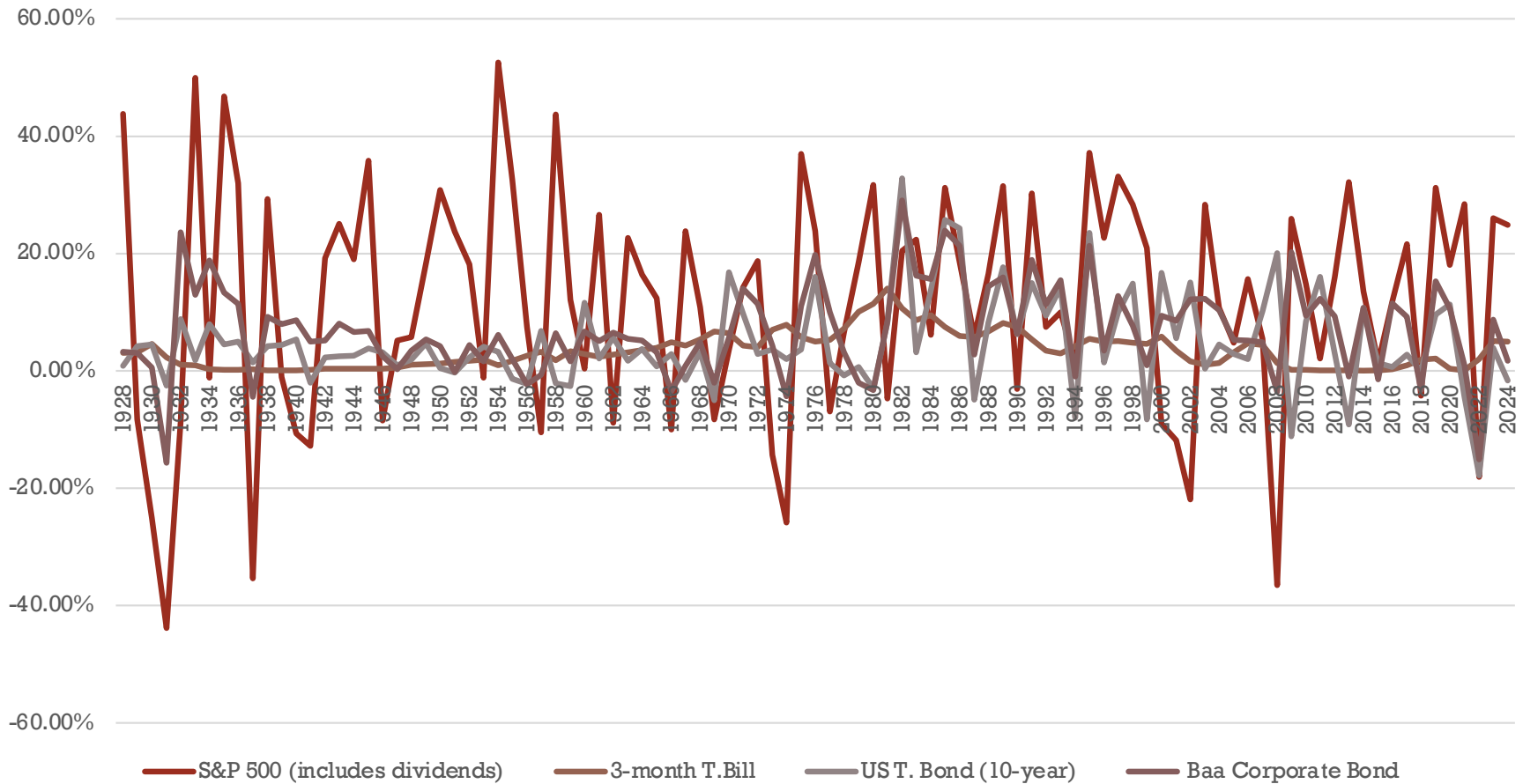
A SINGLE INVESTMENT: ESTIMATING THE VOLATILITY IN DISNEY PRICES FROM 2008-13

Disney: Stock Price and Returns (9/08-9/13)



ACROSS ASSET CLASSES: US STOCKS VERSUS US TREASURY BONDS

Returns on Stocks, Bonds and Bills: 1928 to 2024



1. DOWNSIDE VERSUS TOTAL RISK

- The **standard deviation in returns or prices is based upon the deviation of either from the average** and counts upside deviation (where you earn more than the average) as well as downside deviation (where you earn less than the average).
- To the extent that **it is downside risk that creates pain**, there are some who argue that risk should be measured looking at only negative outcomes.
 - Semi variance measures the variance only in returns that fall below the average return.
 - A non-parametric measure of downside risk can be obtained by looking at the percentage of periods where a stock generates negative returns. With Disney, for instance, the returns were negative in 19 of 60 months.

2. CASH FLOW OR EARNINGS BASED RISK

- Since most investment philosophies are built on the presumption that markets make mistakes, **there are some who argue that it is contradictory to use a market number (prices, returns) to estimate the risk in an investment.**
- In intrinsic value investing, in its purest form, you buy an asset for its cash flows and the risk to you, then, is the risk that these cash flows will not meet your expectations. For these investors, **a better measure of risk may be the volatility in earnings or cash flows.**
- The problem, though, is that unlike market prices, which are updated constantly, earnings and cash flows are estimated periodically (and by accountants)>

3. STAND ALONE VERSUS PORTFOLIO RISK

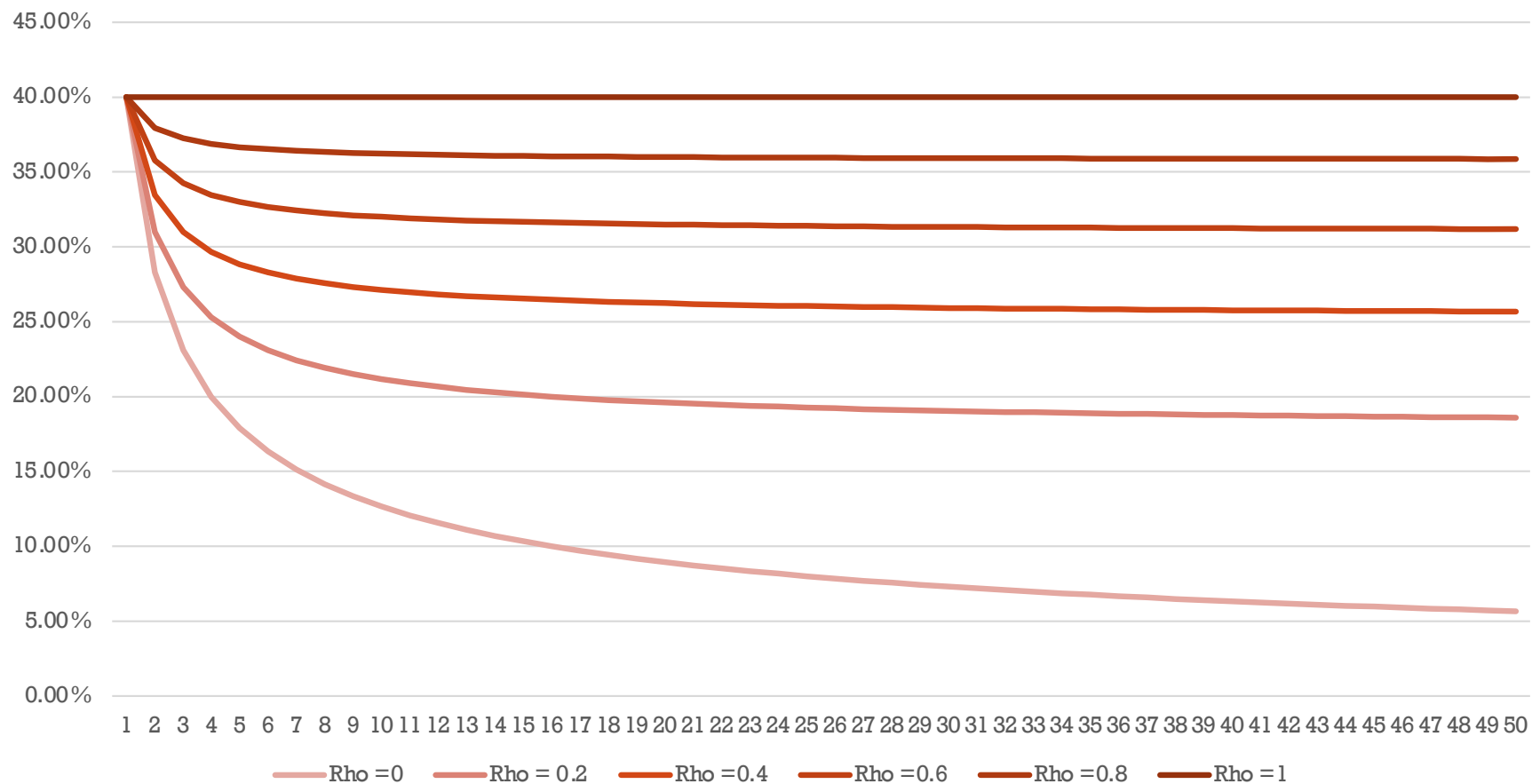
- When assessing the risk in an investment, you can look at risk in one of two ways:
 - **Stand alone:** You can look at the total risk in an investment.
 - **Portfolio:** You can look at the risk added by the investment to your portfolio.
- **The Markowitz Revolution:** If there is a change that has come to investments from the development of finance as a discipline, it is that rational investors should focus on the latter, not the former, since your wealth is determined by what your overall portfolio does.

THE INTUITION OF DIVERSIFICATION

- On economic grounds, diversifying and holding a larger portfolio eliminates investment-specific risk for two reasons-
 - a. Each investment is a **much smaller percentage of the portfolio**, muting the effect (positive or negative) on the overall portfolio.
 - b. Investment-specific actions can be either positive or negative. In a large portfolio, it is argued, **these effects will average out to zero.**
- The latter benefit will occur **only if your investments don't move in proportion.** Even if they move together most of the time, there will be diversification benefits from the times that they do not.
- The **less your investments move together** (the lower the correlation), the greater the benefits to diversification/.

THE STATISTICS OF DIVERSIFICATION

The Magic of Diversification



RISK: THE BOTTOM LINE

- We can disagree about how best to measure risk, but **to argue that you do not have to measure risk or that risk does not matter is foolhardy.**
- Different investment philosophies can **come up with different measures of risk**, reflecting different beliefs about markets and different time horizons.
- Every investor has to **measure the returns that he or she generates on his investments against what he or she should have made, given risk exposure.**