Volatility and Risk

What you hope for…Starbucks (as of 2/28/22)

Image Source: finance.yahoo.com

What you sometimes get…Starbucks (as of 4/29/22)

Image Source: finance.yahoo.com

Your nightmare: What do we mean by "Investment Risk"

Often we hear about owning individual stocks as "risky" investments – what do we mean by that?

GE Stock Price over the last 20 years…

If you own GE stock and feel like this, then owning GE is risky for you…!

Image Source: finance.yahoo.com

What do we mean by "Investment Risk"

Assume you paid $100 for a share of stock.

The stock had the following annual returns over a period of 8 years.

Year	Return	Portfolio Value
0		$100.00
1	20%	$120.00
2	0%	$120.00
3	10%	$132.00
4	-10%	$118.80
5	30%	$154.44
6	15%	$177.61
7	10%	$195.37
8	5%	$205.13

$100 * (1 + 0.20)

$120 * (1 + 0.00)

$120 * (1 + 0.10)

$132 * (1 + (-0.10))

Average Return: 10%

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But there is a lot of variability from one year to the next, best captured by the Standard Deviation (SD) of the annual return values.

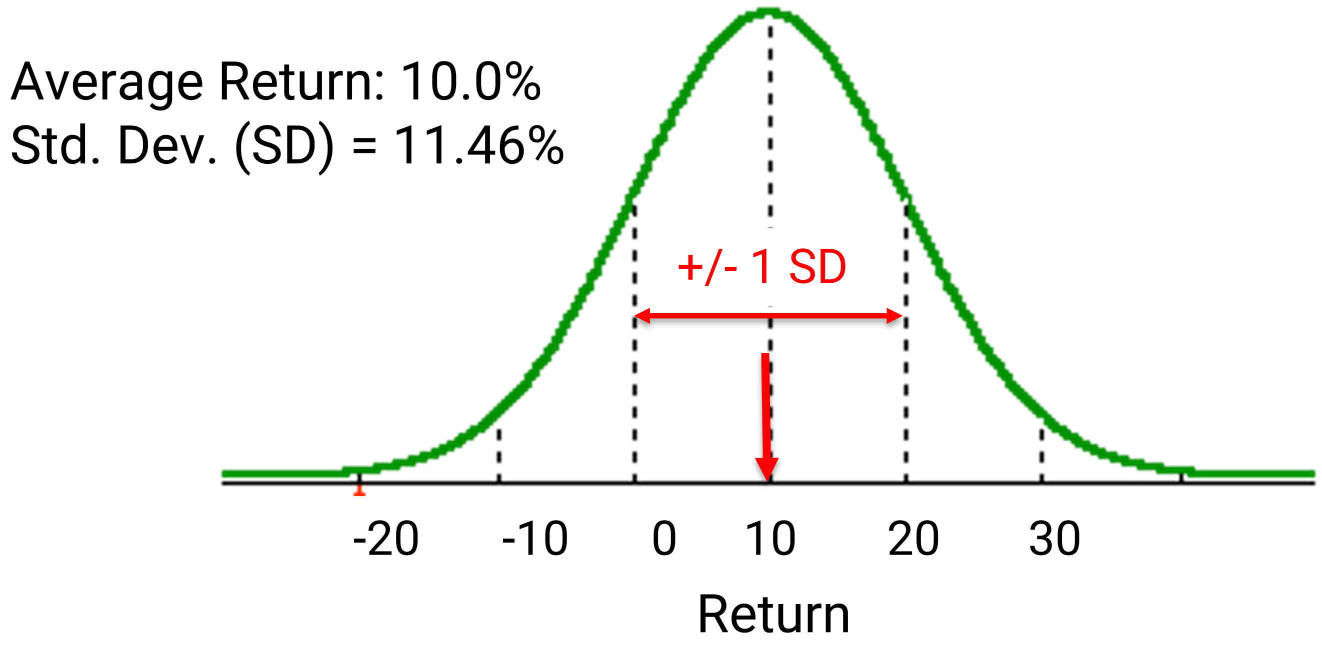
Financially, "Risk" is defined as the volatility in stock price, or the *variability* in stock price, characterized by the SD.

Std. Dev. (SD) = 11.46%

Investment Risk

Assume you paid $100 for a share of stock.

The stock had the following annual returns over a period of 8 years.

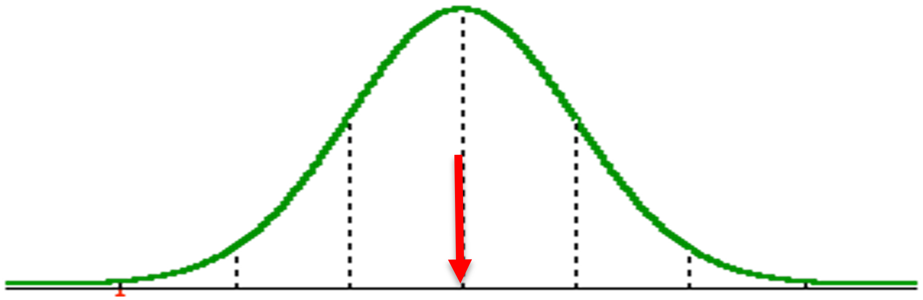


Statistically speaking, 2/3 of the annual returns will be within 1 standard deviation of the average: -1.46% to 21.46%

Investment Risk

Standard Deviation as an indicator of Risk…

Average Return: 10%
Std. Dev. (SD) = 20%



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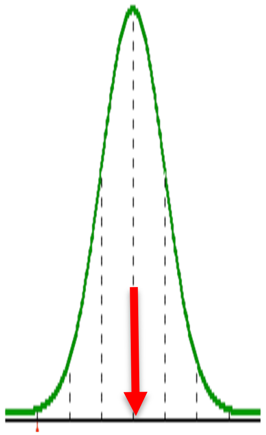
High Risk

Average Return: 10%
Std. Dev. (SD) = 5%



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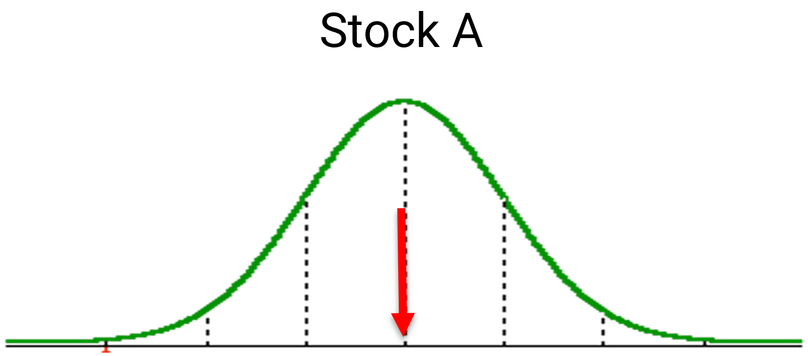
Low Risk

You would be much better off selecting the stock with the lower volatility – especially if the average is the same.

Investment Risk

What if I owned 2 stocks…with similar levels of risk



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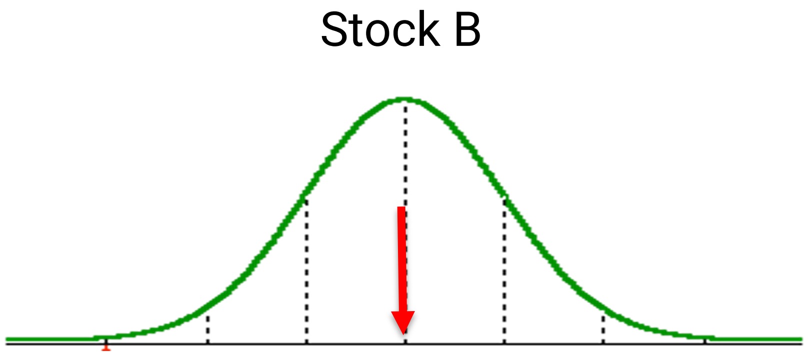


What is the risk if I owned equal amounts of both of these?

Investment Risk

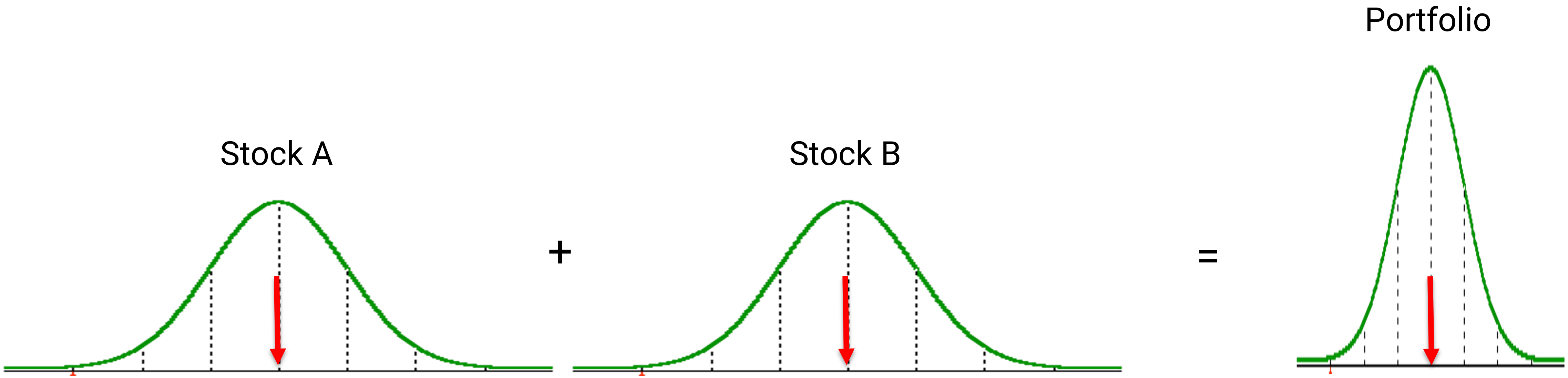
What if I owned 2 stocks…with similar levels of risk

	A	B	C	D	E	F	G	H	I	J	K
1	**Volatility Risk Example**										
2											
3	**Initial Investment**		**$100**								
4											
5	**50% of Stock A & 50% of Stock B**										
6											
7		**Stock A**				**Stock B**				**Portfolio**	
8	**Year**	**Starting**	**Annual**	**Ending**		**Starting**	**Annual**	**Ending**		**Average**	**Portfolio**
9	**Ending**	**Value**	**Return**	**Value**		**Value**	**Return**	**Value**		**Return**	**Value**
10	1	$50.00	30%	$65.00		$50.00	30%	$65.00		30%	$130.00
11	2	$65.00	30%	$84.50		$65.00	-10%	$58.50		10%	$143.00
12	3	$84.50	-10%	$76.05		$58.50	30%	$76.05		10%	$152.10
13	4	$76.05	-10%	$68.45		$76.05	-10%	$68.45		-10%	$136.89
14											
15		**Average**	**10%**			**Average**	**10%**		**Average**	**10%**	
16		**Std. Dev.**	**23%**			**Std. Dev.**	**23%**		**Std. Dev.**	**16%**	

Investment Risk

What if you owned 5 stocks?
25 stocks?

What if I owned 2 stocks…with similar levels of risk



By owning 2 stocks (you've "diversified"), you reduce your investment risk considerably.

Individual Stocks vs. Stock "Funds"

Owning 1 Stock (e.g., GE, or even Tesla: a lot of price volatility)

Owning Multiple Stocks: "diversifying your portfolio" to minimize risk
(e.g., when one goes down, some other stock might go up).

How do you own multiple stocks:

- Buy stock in a lot of different companies (a very $$$ proposition!)
- Buy a "fund" – where someone else has bundled several stocks into a single "mutual fund".

E*TRADE

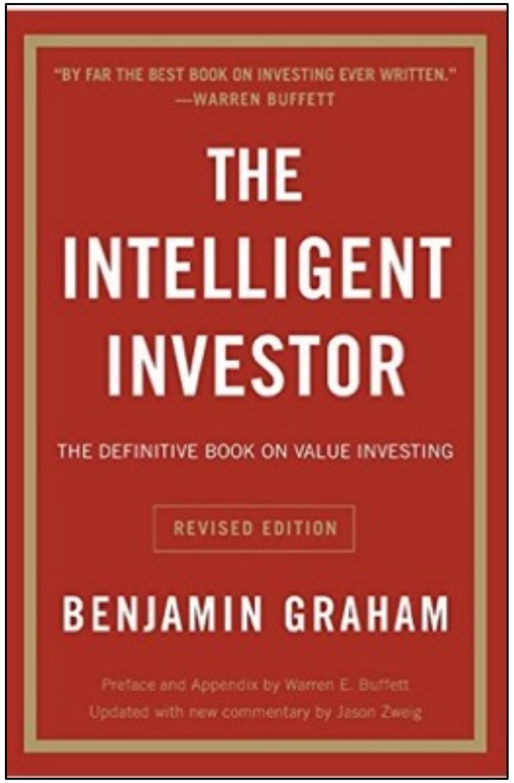
TD Ameritrade

charles SCHWAB

Vanguard

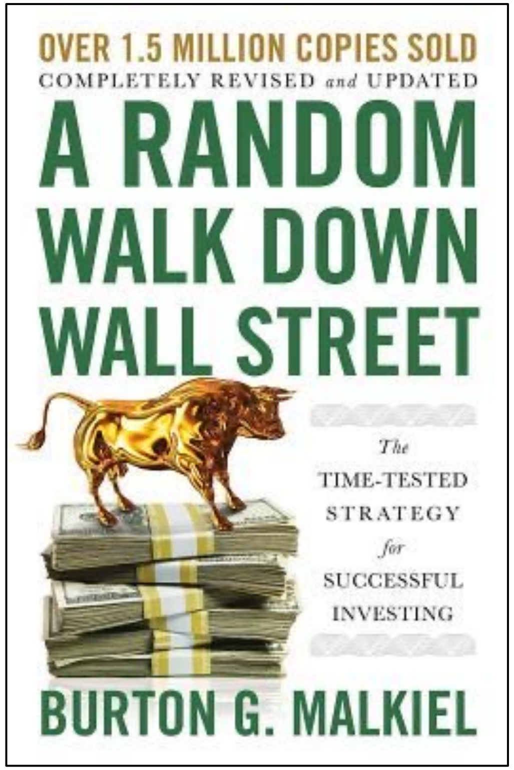
and many more!

Important Reads



You can beat the market with appropriate research.

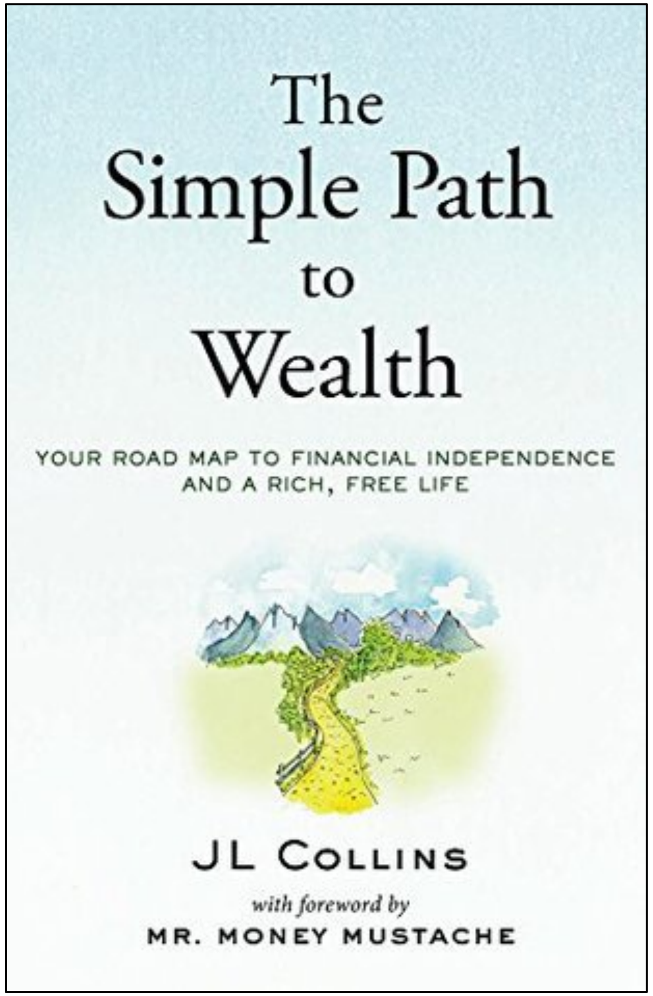
You can never beat the market, so play the averages.



The Quintessential Guide to Investing in Stocks

The Quintessential Guide to Investing in Index Funds

A Very Good First Book…



Here’s one recommended by a friend of mine.

Very simple to follow and very helpful understanding all the terminology.

Very much a “you can’t beat the market so don’t even try” approach.

Main Takeaways…

- Stock price variability is defined as its volatility.
- Volatility is a measure of risk: the greater the volatility, the greater the risk.
- Statistically, volatility can be quantitatively defined as the standard deviation of returns over a period of time.
- Stock (and bond) funds reduce the risk of owning single stocks by spreading the stock price volatility across an entire “basket” of companies.

Most retirement plans do not allow you to invest in a single company’s stock.
But you can invest in funds, which are a lower risk approach.
Therefore, we’ll focus on stock funds, bond funds, and combinations of the two.

Next Time…

Stock and Bond Funds

Credits & References

Slide 1: Investment volatility metaphor of riding roller coaster, financial stock market fluctuation rising up and falling down concept, people investors riding roller coaster on fluctuated market by Nuthawut, Adobe Stock (408535511.jpeg).

Slide 2: Starbuck stock price image source, Yahoo Finance, https://finance.yahoo.com/chart/SBUX (accessed February 22, 2022).

Slide 3:Starbuck stock price image source, Yahoo Finance, https://finance.yahoo.com/chart/SBUX (accessed April 29, 2022).

Slide 4: Surrender emoticon by Yael Weiss, Adobe Stock (117147600.jpeg). GE stock price image source, Yahoo Finance, https://finance.yahoo.com/chart/GE (accessed February 22, 2022).

Slide 12: Charles Schwab & Co., Inc, Public domain, via Wikimedia Commons. https://commons.wikimedia.org/wiki/File:Charles_Schwab_Corporation_logo.png (accessed May 1, 2022). E-Trade, Public domain, via Wikimedia Commons, https://commons.wikimedia.org/wiki/File:ETrade.svg (accessed May 1, 2022). TD Ameritrade, Public domain, via Wikimedia Commons, https://commons.wikimedia.org/wiki/File:TD_Ameritrade.svg (accessed May 1, 2022). KaramTM, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Logo_Vanguard.jpg (accessed May 1, 2022).

Slide 13: Intelligent Investor image source: Amazon, https://www.amazon.com/Intelligent-Investor-Definitive-Investing-Essentials (accessed May 1, 2022). Random Walk image source: Amazon, https://www.amazon.com/Random-Walk-Down-Wall-Street (accessed May 1, 2022).

Slide 14: Simple Plan to Wealth image source: Amazon, https://www.amazon.com/Simple-Path-Wealth-financial-independence (accessed May 1, 2022).

Slide 16: Focus on mutual fund investing by JohnKwan, Adobe Stock (19295319.jpeg).