A Beginner's Guide to Personal Investing

Introduction

Breaking into the world of investing can feel intimidating. After all, your money is hard-earned, and the idea of risking it can be unsettling, especially on something unfamiliar. But avoiding investing altogether comes with its own risks. In fact, by not investing, you could be losing money over time due to inflation and missed opportunities for growth.

This report explores the essential features of personal investing: why investing is important, when to start, what types of assets to consider, and more. But rather than just telling you, we'll show you. Through a series of clear and insightful visualizations, we'll break down complex concepts and provide a comprehensive view to help you make informed decisions as you begin your investment journey.

Definitions

Before we get started, let's define a few items we'll refer to throughout the report that we want to make sure you fully understand.

Stock	A stock represents ownership in a single company. When you buy a stock, you own a small piece of that company and can benefit if the company grows or makes profits.
ETF	An ETF is like a basket of many investments (like stocks or bonds) that you can buy and sell like a stock. It gives you instant diversification by spreading your money across many companies or assets.
Inflation	Inflation is the rise in prices over time, which means the purchasing power of your money goes down. In simple terms, the same dollar buys less in the future than it does today.
S&P 500	The S&P 500 (Standard & Poor's 500) is a stock market index that tracks the performance of 500 of the largest publicly traded companies in the U.S., such as Apple, Amazon, and Microsoft. It's often used as a benchmark to measure how well the overall stock market is doing.
SPY	SPY is a ticker symbol for an exchange-traded fund (ETF) that aims to match the performance of the S&P 500. When you buy shares of SPY, you're essentially investing in all 500 companies in the index at once. It's a

	quick way to get exposure to the overall U.S. stock market.
Bonds	A bond is like an IOU. You lend money to a company or government, and in return, they promise to pay you back later with interest. Bonds are generally considered less risky than stocks and are used to add stability to an investment portfolio.
BND	BND is the ticker for a total bond market ETF offered by Vanguard. It invests in a broad mix of U.S. government and corporate bonds, making it an easy way to add bond exposure to your portfolio without picking individual bonds.
Commodities	Commodities are physical goods like gold, oil, or wheat that can be bought and sold. Investors buy them as a hedge against inflation or when they believe the price of the commodity will rise.
GLD	GLD is an ETF that tracks the price of gold. Instead of buying physical gold bars, you can buy shares of GLD to get exposure to gold's price movements in your investment account.
Real Estate	Investing in real estate means putting money into property, either directly (like buying a house) or indirectly (like through real estate investment funds). It can provide income through rent and value growth over time.
VNQ	VNQ is a real estate ETF from Vanguard. It invests in a group of companies called REITs (Real Estate Investment Trusts) that own and operate income-generating properties like apartment buildings, shopping centers, and office spaces.
Cryptocurrency	Cryptocurrency is a type of digital money that operates on decentralized technology called blockchain. It's not backed by a government or bank, and its value can change quickly. It's considered a high-risk, high-reward investment.
Bitcoin	Bitcoin is the first and most well-known cryptocurrency. It was created as a decentralized digital currency, and some people invest in it as a speculative asset or digital store of value, similar to gold.
GBTC	GBTC is a trust that allows people to invest in Bitcoin through the stock market, without needing to buy or store the actual digital currency themselves. It's a way to get exposure to Bitcoin through a regular brokerage account.

Section 1: Why invest in the first place?

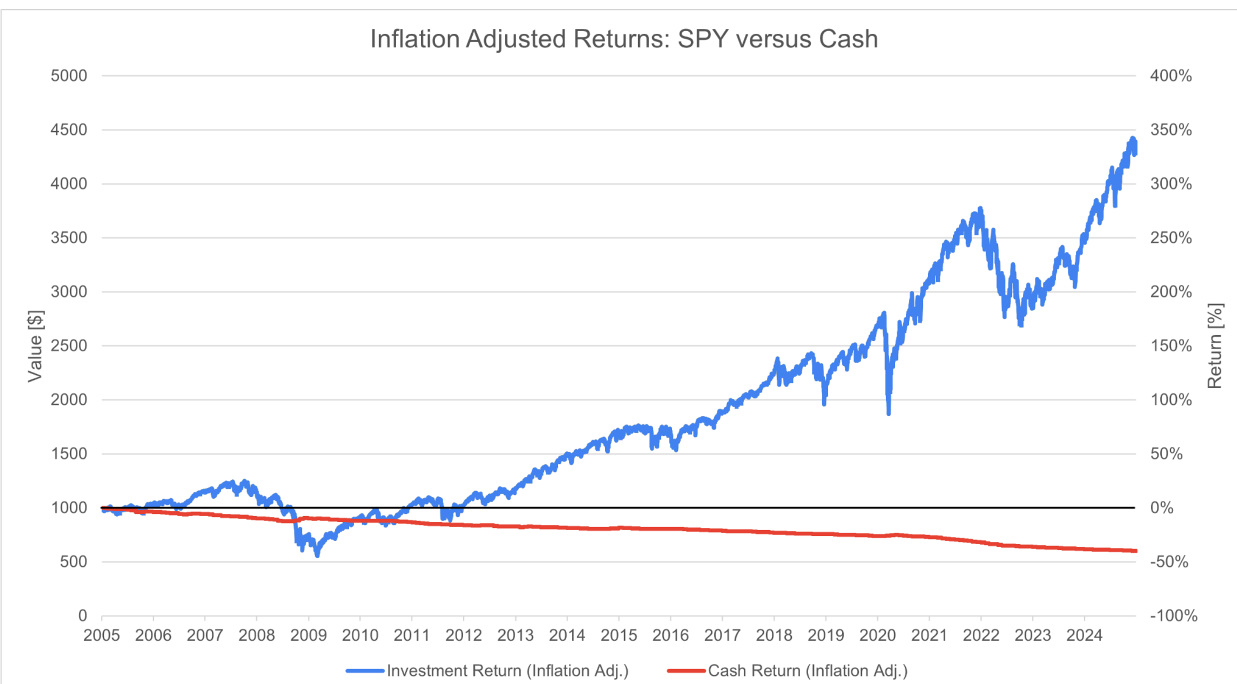
Holding cash feels safe. Whether it's in a piggy bank, tucked under the mattress, or sitting in your savings account, there's comfort in knowing exactly where your money is. But here's the catch: while your cash just sits there, its value is quietly shrinking.

That's because of inflation. As prices rise over time, the same dollar buys you less and less. So even though the number in your account stays the same, what that money can actually do for you is decreasing.

By investing in something diversified and with the potential to grow steadily over time, you can help your money keep up with, or even outpace, inflation. In short, investing helps your money hold its value, while simply holding onto cash might mean falling behind.

Let's look at a visual that compares the returns over 10 years of holding $1000 in cash (adjusted for inflation) with investing $1000 in SPY (defined above), a proxy for the stock market, also adjusted for inflation.

Visual 1 [Excel]:



As you can see, inflation reduces the value of the cash, while the invested money becomes more valuable.

Section 2: When is the right time to start investing?

The simple answer? Right now. When you invest in something that steadily grows, you benefit from a powerful force called compounding. Think of compounding like a snowball rolling down a hill. It starts small, but as it rolls it picks up snow and gets bigger faster.

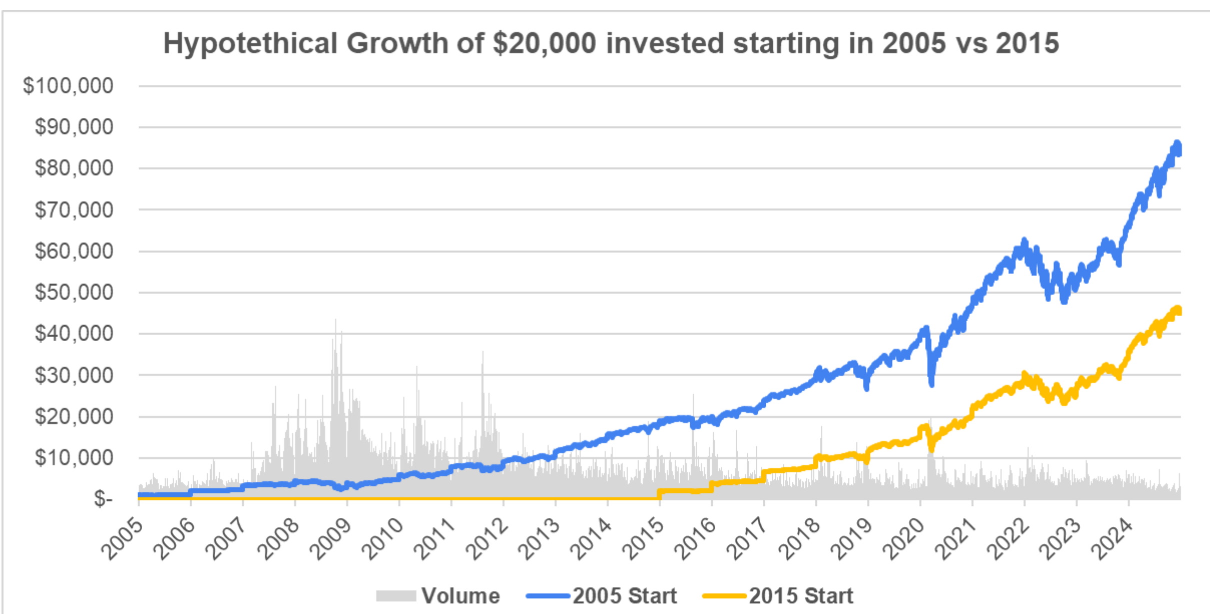
In investing, this means you earn money not just on your original investment, but also on the returns you've already made. So your money earns more money, and then that money earns money too. The earlier you start, the more time your investment has to grow and the more powerful compounding becomes.

The visual below will explain this. Let's look at two scenarios:

- Scenario 1: Investing $1,000 every year on starting in 2005
- Scenario 2: Investing $2,000 every year on Starting in 2015

By 2025, both scenarios will have invested the same amount of cash: $20,000. But look at the difference getting started early makes! The value of the Scenario 1 portfolio in 2025 is almost double that of Scenario 2.

Visual 2 [Excel]:



Even small amounts invested early can grow into something much bigger over time. That's why starting now even with a little is one of the smartest financial moves you can make. Another quick thing to note in the chart above: large movements in the market usually correlate with spikes in volume.

Section 3: What about everything out of my control?

Another simple answer? Bad stuff will happen. But that doesn't mean you should avoid investing. The financial markets are resilient. Yes, they take hits (recessions, bubbles, bankruptcies, global crises), but they also have a long history of bouncing back and rewarding those who stay invested.

Over the past 20 years, we've seen major events shake the economy, yet the market has always continued to grow in the long run. The chart below tells this story in two parts:

- Top graph: daily price of SPY, highlighting key events that triggered declines.
- Bottom graph: 5-year rolling returns of SPY, which helps you see how the market performed over time, even through the ups and downs the 5-year returns rarely turned negative.

Visual 3 [Python (matplotlib)]:

Despite the turbulence, a long-term investor in the S&P 500 has often doubled their investment over a five-year period. That's the power of staying invested even when things get tough.

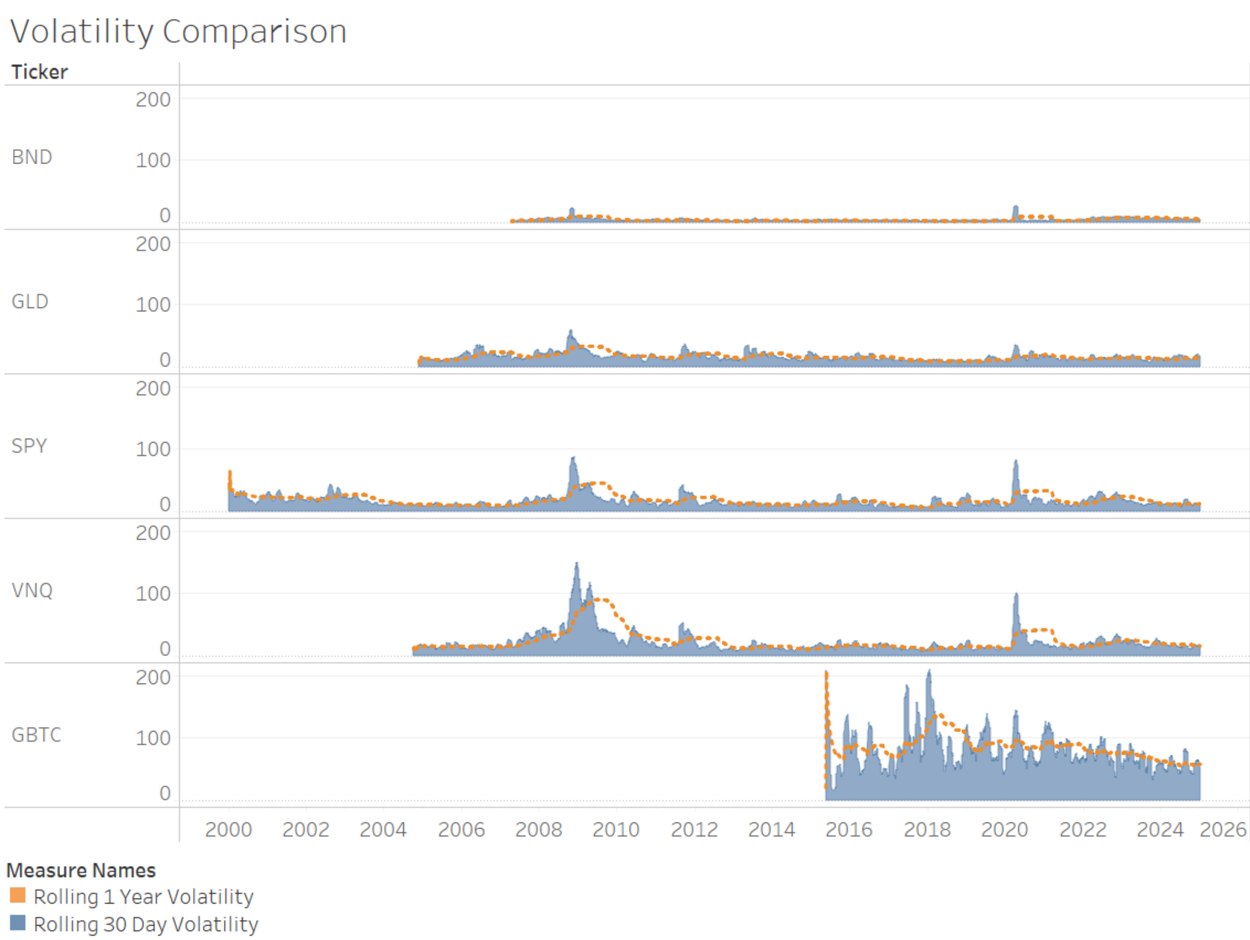
Section 4: How smooth is the ride?

That depends on what you invest in. So far, we've looked at SPY, an ETF that tracks the S&P 500. Over the past 20 years, it's shown a generally steady upward trend despite a few bumps along the way. But if you zoom in and look at daily movements, the ride gets a lot messier.

Different types of assets behave differently. Some tend to be more stable, while others are more unpredictable. For example, bonds or commodities like gold often move slowly and steadily, while cryptocurrencies can swing wildly from day to day.

Let's take a closer look. The charts below compare the 30-day rolling volatility of several asset types: Bonds (BND), Gold (GLD), S&P 500 (SPY), Real Estate (VNQ), Bitcoin (GBTC). In these charts, the flatter the profile and closer to zero, the steadier the asset.

Visual 4 [Tableau]:

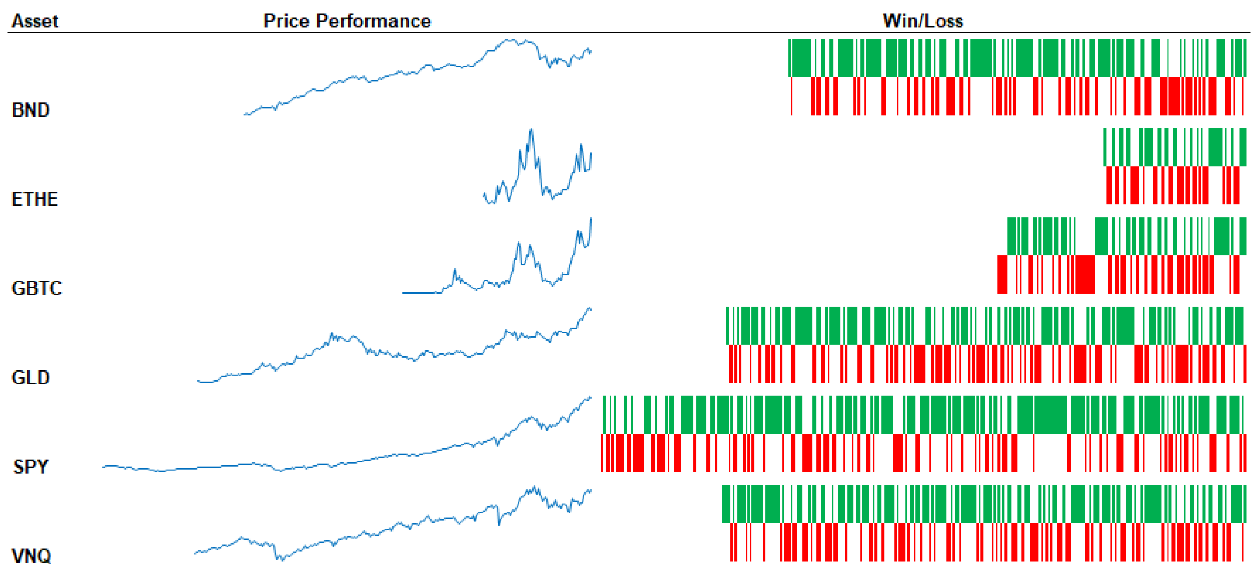


As shown, the bond market experiences very low volatility, while cryptocurrency prices can swing dramatically. This contrast is a clear illustration of the different levels of investment risk.

[Note: for an interactive version, refer to the Github repository for a plotly graph]

For a more detailed look at each of the asset's win/loss performance, here is another visualization:

Visual 5 [Excel]:



As shown, all asset classes show some win/loss streaks during certain periods in time. However, it is almost always the case that the returns end up making up for any losses.

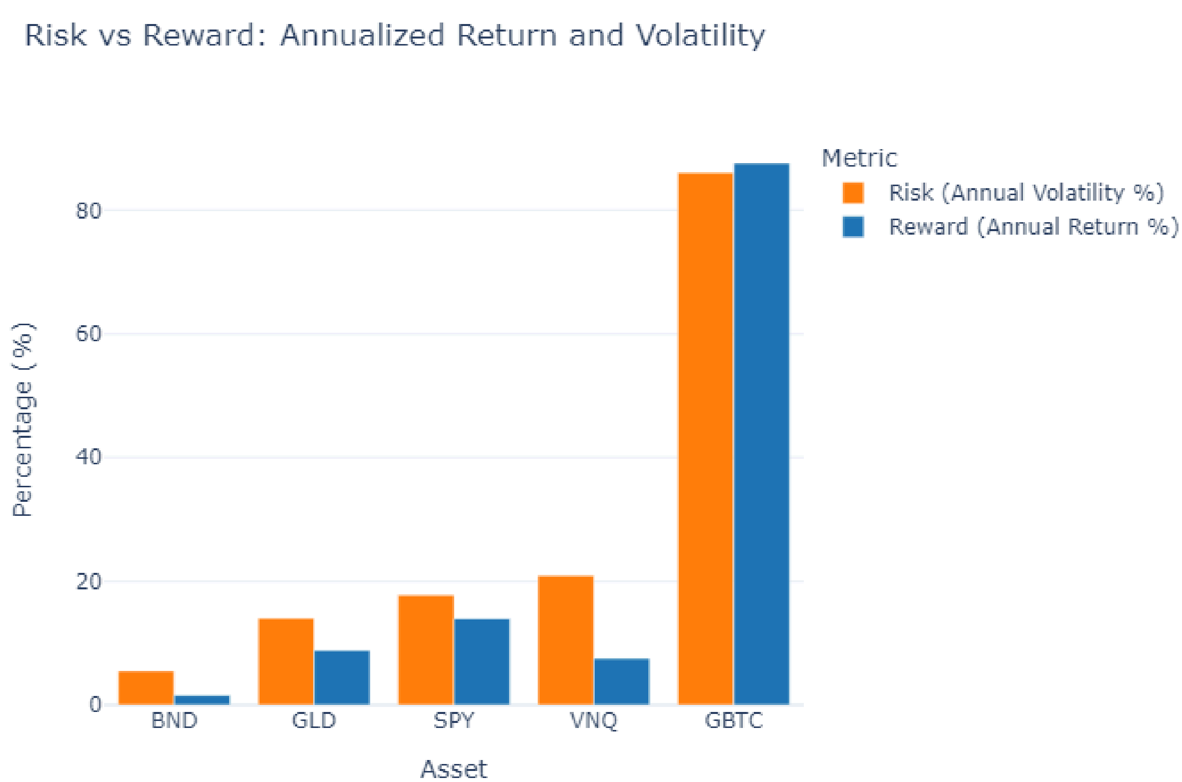
Section 5: Why take any risk at all?

Risky assets can be unpredictable, but that volatility also offers the chance for higher returns compared to safer investments like bonds or cash. The basic idea is that higher risk often leads to higher reward. While safer assets provide stability with lower returns, riskier stocks have the potential to grow significantly over time.

Including some risk in your portfolio lets you aim for greater gains and faster wealth growth. The key is balancing risk with diversification and your personal comfort. Simply put, taking on some risk is necessary if you want the chance for bigger rewards.

Using the same assets as before, let's look at the correlation between risk and reward.

Visual 6 [Python (plotly)]:



While cryptocurrency has been the most risky asset, it has also delivered the highest returns, whereas the bond market has been the least risky but also offered the lowest returns among the asset classes analyzed.

Section 6: How should I pick what to buy and how much?

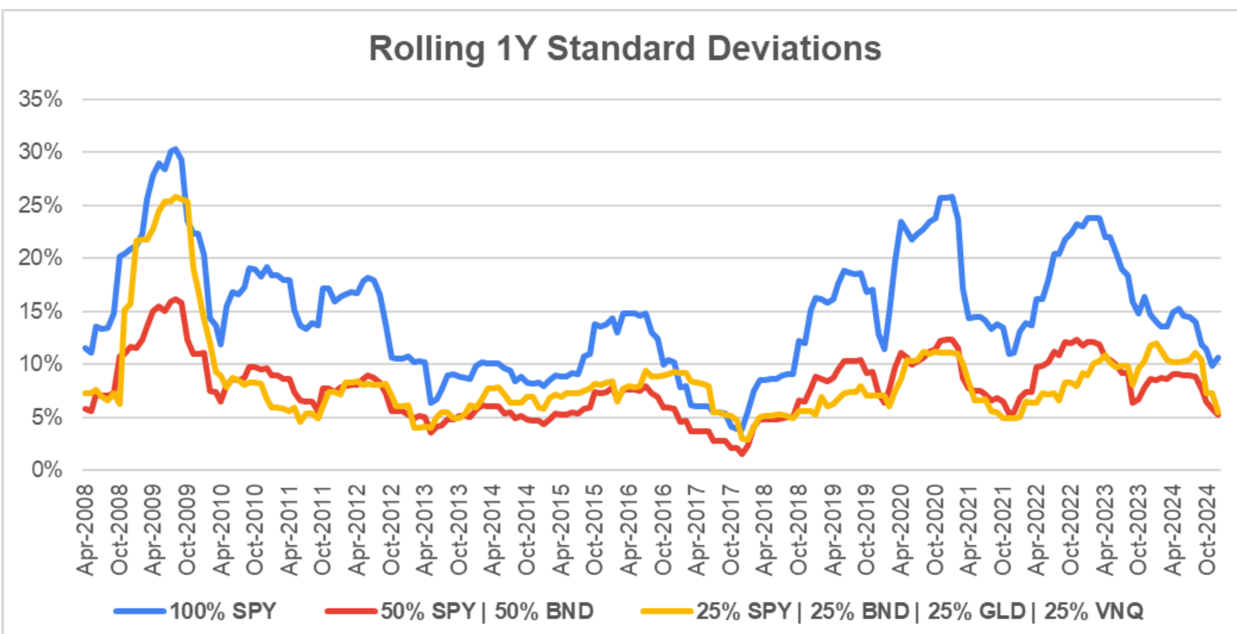
Choosing what to invest in and how much depends on your comfort with risk. At a high level, you want a mix of investments that balances the potential for high returns with the stability of more reliable assets. This is where diversification comes in.

Diversification means spreading your money across different types of investments so that you're not relying on just one thing to perform well. The goal is to reduce risk by avoiding "putting all your eggs in one basket."

To build a strong portfolio, you'll want to include a mix of assets that match your risk tolerance and don't all behave the same way. This helps protect your money while still allowing it to grow.

Now, let's look at a few example portfolios with different asset allocations to see how they affect the smoothness of the return profile.

Visual 7 [Excel]:



As can be seen, generally when the investments are spread over several asset classes there is a lower standard deviation of return, indicating a more stable investment. However, it must be mentioned that diversification has diminishing returns, therefore more is not always better when it comes to diversifying your portfolio. Diversification must be applied strategically to get the best of its benefits.

Section 7: Try It Yourself – Building a Portfolio

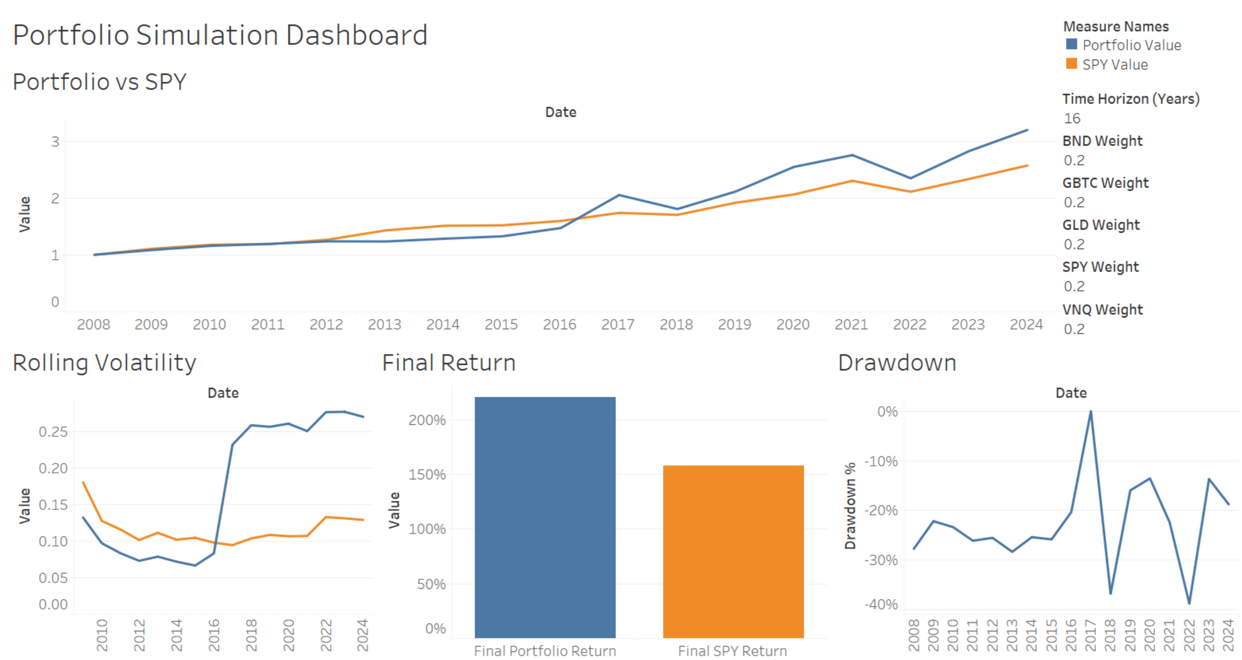
Now that you've learned the basics of investing, how risk and reward work, volatility, the role of different asset types, and why diversification matters, it's time to put that knowledge into action. In this section, you'll explore how changing asset allocations can affect portfolio performance across different time frames.

To get started, open the Tableau workbook titled "Explore Your Portfolio Options". Navigate to the dashboard and use the interactive inputs on the right hand side to adjust the weightings of the various assets we've discussed (like stocks, bonds, gold, real estate, and crypto). Of course, please ensure your portfolio weights add up to 1 to obtain a meaningful result.

As you make changes, observe how the return and volatility of the portfolio respond. This hands-on experience will help you better understand the tradeoffs in real investing.

Here is an example of what the dashboard looks like:

Visual 8 [Tableau]:



Conclusion: Investing with Confidence

Investing might seem intimidating at first, but with a clear understanding of the fundamentals like risk and reward, diversification, asset types, and timing it becomes much more approachable. Throughout this guide, you've seen how different investments behave over time, and the importance of starting investing early, how combining asset classes strategically can smooth out returns, and how even small choices in allocation can make a big difference.

The most important takeaway? You don’t have to be an expert to get started. By staying diversified, aligning your investments with your comfort for risk, and keeping a long-term mindset, you can build a portfolio that grows with you.

The earlier you start, the more time your money has to grow and the more confident you’ll feel navigating the world of personal investing. We hope this guide will help you take that first step towards your financial freedom.