

WHARTON FINANCIAL ANALYTICS

Data
Lab

Stocks for the Long Run

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Michael R. Roberts is the William H. Lawrence Professor of Finance at The Wharton School of the University of Pennsylvania. He developed this data lab solely for the purpose of class discussion. The lab is not intended to serve as an endorsement, source of data, or illustration of effective or ineffective decision making. Although based on real events and despite occasional references to actual companies, this lab is fictitious and any resemblance to actual persons or entities is coincidental.

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At noon on the first Monday of February of 2020, Steve Katz stepped out of the monthly executive committee meeting at Premium Funding Wealth Management. Steve, the President of Client Advisory Services (CAS), walked swiftly down the hall. He was headed straight for Elizabeth “Bess” Pope’s office. Bess, the Vice President of CAS, was Steve’s direct report and likely successor.

Steve walked into Bess’ office and closed the door. “I just had a ‘lively’ discussion with Letty and the rest of the committee,” said Steve. Letty Bohan was the CEO and founder of Premium Funding. “She and several other members of the SLT [senior leadership team] argued that stocks are safer in the long-run so we should change investment recommendations to our retail clientele. I don’t think that’s right and Patty [head of risk management] agreed with me. We have until the next meeting to figure this out. You’ll take the lead.”

Steve then shared with Bess the details of the meeting, namely the arguments that stocks are or are not less risky in the long-run. Most arguments were based on loose memories, anecdotes, and experience, that last of which should not be discounted given how many years each member of the SLT has worked in investment management. With one month until the next executive committee meeting, Bess understood there was no time to lose.

Premium Funding Wealth Management

Premium Funding is an asset management company founded in 1978. Headquartered in San Diego, California, the company employs over 300 people. As of year-end 2019, assets under management (AUM) reached over \$250 billion. Though a global services company, almost 90% of their revenue is from US-based clients. Only since 2015 have they operated internationally, mostly in East Asia.

Premium Funding’s business is organized into two divisions differentiated by their customers. The retail division caters to clients whose net worth is less than \$5 million. The institutional business caters to high net-worth individuals (greater than \$5 million net worth) and institutions. The retail business accounts for approximately 95% of their 250,000 accounts, but less than 20% of their total revenue.

The company was aggressively expanding its retail division to increase its customer base and diversify its revenue stream. In addition to a larger market, the retail business offers larger margins because

smaller investors pay higher fees on a per dollar basis. The retail division is also a feeder to the institutional division. Today's young savers are tomorrow's high net worth individuals.

The Debate

The monthly executive committee meeting is typically a reserved but productive affair. The senior leadership team (SLT) uses the meeting to stay abreast of current affairs and plan for the future. The discussion is well-organized and cordial, but reminiscent of an academic seminar in that disagreement and debate are encouraged. This environment was intentionally cultivated by Letty Bohan, who spent several years in academia before starting Premium Funding.

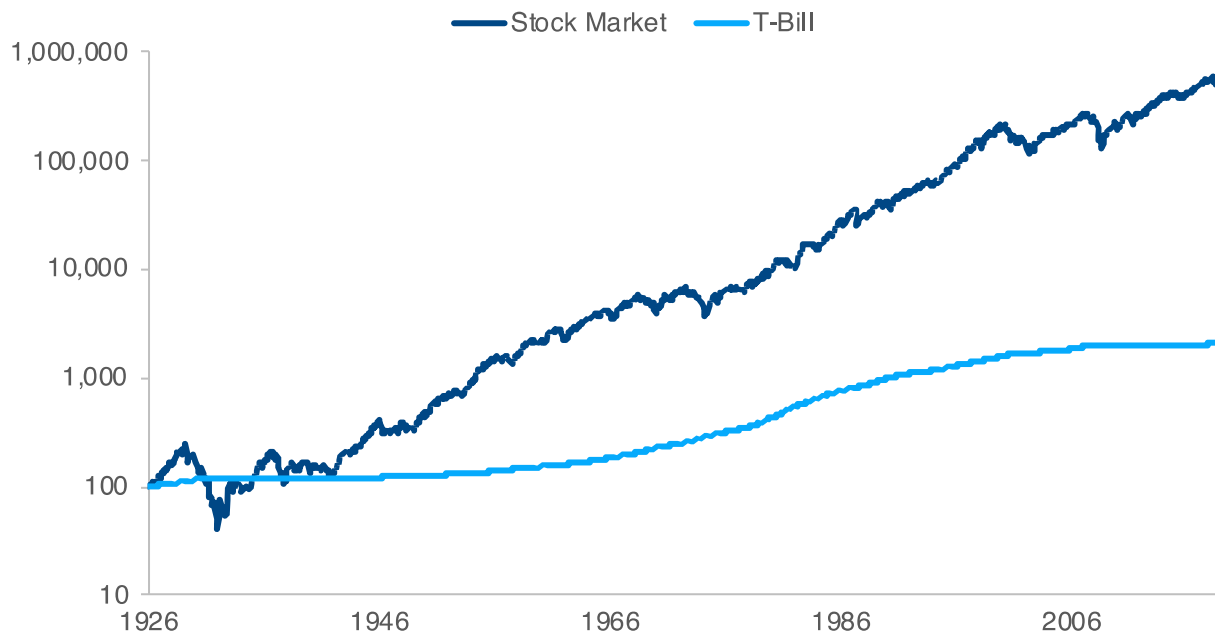
The February 2020 meeting was similar in spirit to previous meetings but the debate a bit more heated. Several members of the committee, including Letty, argued that their younger clients with longer investment horizon should be advised to tilt their portfolios towards riskier investments, such as stocks, because risk is decreasing in the length of the horizon. Leonard Farrell, the head of operations, summarized this sentiment.

“Look at the last 100 years of the stock market. [Figure 1] Sure, there's been ups and downs but the trend is crystal clear. Ride out the short-run bumps and you've been all but guaranteed to make significant money in the long-run.”

Patty Dale, the head of risk management, disagreed.

“Risk does *not* go down the longer you invest your money. The exact opposite. Volatility scales with the square root of time. Plus, our clients have a variety of investment options so looking at any one in isolation is giving our clients an inaccurate picture of their risk-return tradeoff.”

Figure 1. Value of investing \$100 in June 1926



Source: Center for Research in Security Prices and Ken French Data Library.

As the discussion continued, Leonard pulled up an old issue of *The Vanguard*, a publication of the Vanguard Group, on his laptop and projected his screen onto the conference room monitor. He drew everyone’s attention to the following excerpt.

“Over the past six decades, stocks have achieved an average annual rate of return of 9.7 percent—far exceeding the 5.2 percent average return on corporate bonds and the 3.6 percent average return on U.S. Treasury bills. Yet it's no secret that the stock market is subject to wide and unpredictable price swings in any given year. Consider, however, that the volatility of stock market returns diminishes markedly over time....During any 1-year period between 1960 and 1989, the maximum spread in annual returns of stocks (as measured by the unmanaged S&P 500 Composite Stock Price Index) was 64 percent (from a high of 37.2 percent to a low of -26.5 percent). Over 10-year holding periods, the difference in annual rates of return decreased to 16 percent (17.5 percent to 1.2 percent) and, over 25 years, less than 2 percent (10.2 percent to 8.4 percent). Note that for 10-year periods and beyond, the returns were all positive. Clearly, over time, stock market risk hardly seems excessive—even for the most cautious long-term investor. [emphasis added]...So, take stock of time when investing in stocks.”

Leonard argued that as a guiding principle of one of the largest, most successful asset managers on the planet, Premium Funding would do well to take a similar perspective.

Steve agreed that the stock market has historically performed quite well over long horizons. However, he took strong exception to the matter of risk. “Volatility diminishing over time just doesn’t make sense to me. Additionally, volatility isn’t the only measure of risk that our client’s should keep an eye on. They want to know the likelihood they will lose money and, if they do, how much. And, none of these measures accounts for the risk tolerances specific to each client.” Patty added, “We also have to keep in mind the opportunity cost. If we start pushing our clients into more stock-centric portfolios, we are pushing them out of safe fixed income investments.”

Data

Bess had her lead analyst gather historical performance data on broad stock market indices and Treasury securities. While there were many other investments she could examine, she wanted to limit the scope of her investigation to address the primary issue at hand, namely, whether stocks were less risky over longer horizons. The appendix contains information about the data received by Bess. While the stock data are at an aggregate (market) level, Figure 1 and Table 2 provide insight on the size distribution at the start and end of the sample.

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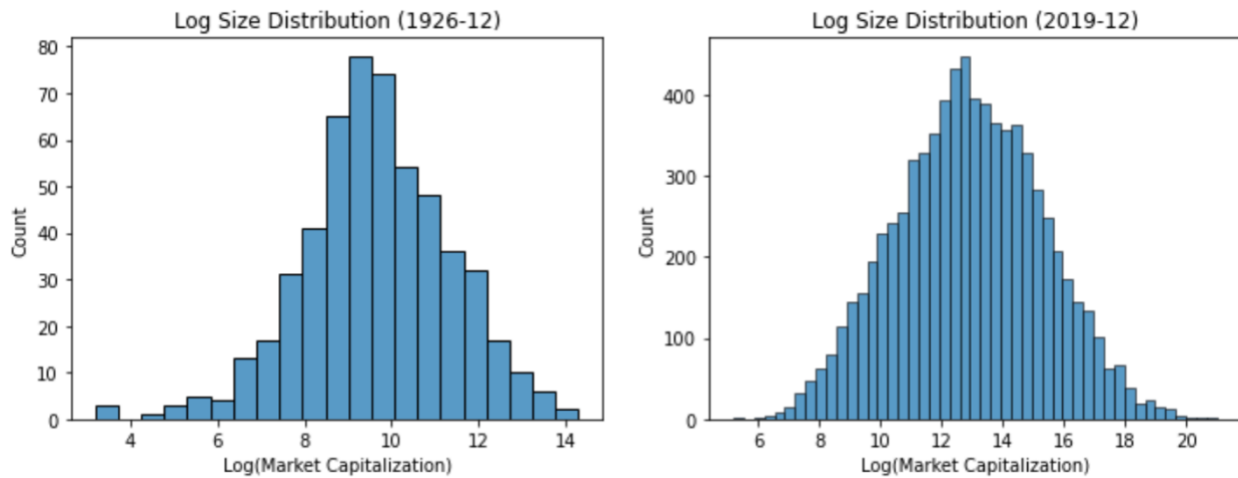
Appendix

Table 1. Data Dictionary

Data filename: 20-stocks-long-run.csv

Row	Variable	Data type	Description
0	date	datetime64[D]	Calendar date format yyyy-mm-dd
1	sprtm	float	Monthly price return to the S&P 500 index
2	vwretd	float	Value-weighted monthly total return to U.S. stock market
3	vwretx	float	Value-weighted monthly price return to U.S. stock market
4	rf	float	Monthly return to 30-day treasury bill
5	treas_1yr_cmr	float	Annual yield-to-maturity on 1-year Treasury bill
6	treas_5yr_cmr	float	Annual yield-to-maturity on 5-year Treasury note
7	treas_20yr_cmr	float	Annual yield-to-maturity on 20-year Treasury bond
8	treas_10yr_cmr	float	Annual yield-to-maturity on 10-year Treasury note

Figure 2. Log Firm Size Distributions in 1926 & 2019



Source: Center for Research in Security Prices
 *Size is measured by market capitalization.

Figure 3. Size Statistics in 1926 and 2019

Date	Number of Firms	Mean	Standard Deviation	Min	Percentiles			Max
					25%	50%	75%	
1926-12	540.0	56,163.2	133,826.0	24.8	5,609.6	14,831.2	50,698.6	1,595,119.6
2019-12	7,586.0	5,640,648.2	32,235,422.4	178.5	75,578.8	388,522.3	2,100,576.0	1,304,764,740.1

Source: Center for Research in Security Prices

*Size is measured by market capitalization.



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