Coronavirus Market-Crash – How Far Did FIRE Retiree’s Capital Drawdown?

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ABSTRACT

This paper investigates the destruction of capital held by FIRE-retirees in the US stock-market as represented by the S&P500 index during the coronavirus market-crash. The performance of a lumpsum of $1,000,000 invested by retirees at the end of each year from 2009 to 2019 were calculated using 4% inflation adjusted withdrawal rates. Findings suggest that at the low point of March 23, 2020 the retirees of the first 4 years (2009 till 2012) using 4% inflation adjusted withdrawals all had their initial $1,000,000 capital plus growth. (Highest positive balance: 2009, $1,485,574, increase of 48.6%. Lowest positive balance: 2012, $1,282,147, increase 28.2%). All retirees from the end of 2013 had their initial $1,000,000 investment decreased to below initial capital (Lowest negative balance: 2019, $692,500, decrease 30.75%). Despite 4% inflation adjusted withdrawals, the longer the retirement period the more likely to experience net capital growth.

The investigation also revealed the effect of 0% or negative returns during the beginning years of an investment. Some $1,000,000 investments made in earlier years (2010, 2014 and 2017) ending in lower balances than investments made in the next year (2011, 2015 and 2018).

KEYWORDS: FIRE movement, Retirement, S&P500 index, CPI adjusted, Coronavirus market-crash

1 INTRODUCTION

The USA, like many other countries, is facing a financial retirement crisis. The hope of retirement security is out of reach for many Americans as secure pensions that last through retirement have been replaced with individual retirement accounts. The average American family has little retirement savings. Among working-age families with at least one earner, nearly 4 out of 5 do not have retirement savings that at least equal their annual income. Two out of three working families have household net worth that falls short of recommended savings targets **Error! Reference source not found.**.

In contrast to the above problem, there is the followers of the FIRE (Financial Independent Retire Early) movement. Whilst consumerism is ingrained in the American culture, the FIRE followers embrace the concept of saving and investing the majority of their income in their 20's or 30's so you can retire early, sometimes in their 30's or 40's. They purposefully plan a life with a short career and a long retirement. This group choose to live extremely frugal (even saving up to 70%) of their annual income in order to accumulate enough funds (in the low millions) so that they are no longer dependent on a paycheck and can live of the combination of investment income and small withdrawals. When retired they typically withdraw no more than 4% of their portfolios to enable them to enjoy a retirement up to 6 decades. The preferred investment vehicles are Index funds and ETF's (Exchange Traded funds). Another favorite investment tool is rental properties **Error! Reference source not found.**. Some of them choose to work from time to time in areas of their hobbies, with money not being a factor in their decision to work.

There are no statistics on the number of FIRE adherents. The U.S. government does not keep records, nor do the retirement-investment companies. From blogs, social media and forums on the internet, it can be determined that the FIRE movement has strong following mostly amongst millennials. It is not possible to determine the ratio of casual readers, followers still aspiring towards financial independence and those who already achieved financial independence. We cannot determine the size of the retirement accounts of those already retired. The Reddit Financial Independence / Early Retirement online community has more than 850,000 members **Error! Reference source not found.**. Sam Dogen, who retired from his Wall Street job at age 34 with $3 million, claims to have had more than 70 million visitors during his 13 years of blogging at The Financial Samurai **Error! Reference source not found.**. Mr. Money Mustache is probably the best-known FIRE blog and introduced thousands to the movement. Peter Adeney started the blog in 2011 after he retired at age 30, through frugal living and smart investing **Error! Reference source not found.**.

The coronavirus market-crash experienced the fastest fall in global stock markets in the financial history. Just like other investors, the FIRE retirees had their portfolios decimated. In the popular financial press headings appeared like *They all retired before 40. Then this happened* **Error! Reference source not found.** or *The FIRE movement meets the Crash* **Error! Reference source not found.**. Some speculated that portfolios were damaged so badly that early retirees are forced back into the workforce and the pandemic might end the FIRE movement. A refreshing voice came from FIRE author Tania Hester with *A recession won't end the FIRE movement, but it will change it for the better* **Error! Reference source not found.**.

This paper seeks to determine how far did the capital of FIRE retiree's drawdown due to the Coronavirus market- crash.

2 LITERATURE REVIEW

There is an oversized body of literature on the pending financial retirement crises in the USA. The bottom line is that half of the households will not have enough retirement income to maintain their pre-retirement standard of living, even if they work to age 65 and annuitize all their financial assets, including the receipts from a reverse mortgage on their homes. This indicates that many of today's workers need to save more and/or work longer to achieve a secure retirement **Error! Reference source not found.**.

FIRE traces its roots to publication of the book *Your Money or Your Life* in 1992. With over a million copies sold, Vicki Robin and Joe Dominguez was instrumental in changing how people view money. They showed readers how people trade their life energy for money and that material success enslaved people more and more. With a step by step program they encouraged people to live more meaningful lives and that it was possible to live on a fraction of the money spent by a typical household. With a reasonable modest investment providing the required income, paid work could be avoided **Error! Reference source not found.**.

In the fallout of the 2008-2009 Great Recession, unemployment peaked at 10%, while the market dropped 56% from its 2007 highs. Some millennials saw how their parents, who worked hard their entire lives, lost their jobs, their houses and their savings. That contributed to a group of people seeking a different way of life. People wanting to live life on their terms, are willing to sacrifice in the short term in order to ensure financial security. By living very frugal and saving as much as possible, FIRE followers typically aspire to acquire enough funds so that they can use a safe withdrawal rate of 4% inflation adjusted to pay for their living expenditure **Error! Reference source not found.**. Tanya Hester is of the opinion that fundamentally those pursuing FIRE seek one thing: to end their reliance on a job. The goal is to not need money from work. It is not to never do a single thing again that happens to earn a person money. It's about making work something you can choose to do, not something you must do **Error! Reference source not found.**.

The question for FIRE followers is how much money should be accumulated in order to ensure a retirement spanning 4, 5 or even 6 decades. In 1994, the financial planner William Bengen determined how much money is required to retire by using historical data since 1926. The period he studied included the 1929 Great Depression and the 1939 Second World War. He looked at the longevity of 30 years for a portfolio consisting of 50% stock and 50% intermediate term Treasury notes. He used an end of first year withdrawal of 4%, followed by inflation-adjusted withdrawals in subsequent years. He did not find any group of years where the portfolio was exhausted before 33 years, and most scenarios would lead to a portfolio lasting 50 years or longer. The circumstance that led to the destruction of a portfolio was an "event", consisting of a severe stock-market downturn and high inflation (**Error! Reference source not found.**. This is how the 4% rule of thumb came into existence – by withdrawing 4% of your capital you need as a safe amount 25 times your projected living expenses.

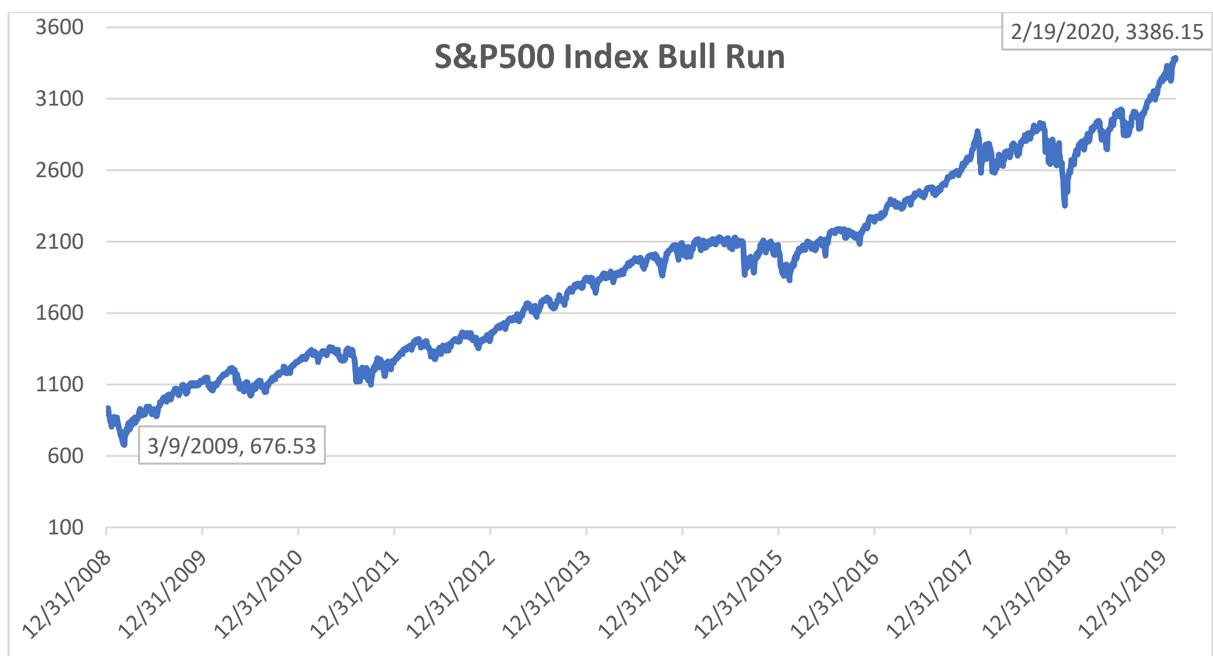
In 1996, Ferguson did a similar work but assumed that the investors plan to leave the principal value of the retirement portfolio to their heirs. He suggested a withdrawal plan of consuming dividend income only from an equity-heavy portfolio. According to him, a withdrawal rate of approximately 3% of the portfolio value would allow a portfolio to retain its real value in the long run **Error! Reference source not found.**. In 1998, Trinity's study used a similar methodology as Bengen's but focused on the idea of portfolio success rates. If an investor's portfolio outlives the investor's planned pay-out period, then it is counted a success. Their numbers imply that young retirees who anticipate long pay-out periods should plan on lower withdrawal rates than their older counterparts. They found for stock-dominated portfolios, withdrawal rates of 3% and 4% over a 30-year period represent exceedingly

conservative behavior. At these rates, retirees who wish to bequeath large estates to their heirs will likely be successful **Error! Reference source not found.**.

Meyer showed the risk of sequence of return as retirees' assets are more sensitive to losses from poor market returns in the years just prior to, or after, entering retirement. If poor returns are experienced during these critical years, their portfolios are threatened more significantly than if their assets were to experience poor market returns much later on in their retirement **Error! Reference source not found.**. In order to mitigate some of the risk of sequence of return, the traditional approach to FIRE is to have at least 1 year of living expenditure in cash so that they don't have to tap their portfolios during a downturn. Some of the more prudent FIRE retirees carry at least 2 to 3 years of expenses in cash **Error! Reference source not found.**.

In the lead up to the Corona market-crash the market enjoyed 11 years of growth, the longest running bull market in history. Up to the crash, some of the younger FIRE contingent has never seen a down market and advocated holding almost all of a portfolio in stocks. This is the group which would be the most vulnerable during a market crash **Error! Reference source not found.**.

The Standard & Poor's 500 index (S&P500) is the benchmark U.S. stock index measuring the stock performance of 500 large companies listed on the exchanges. A bull market is a rally greater than 20%, but only becomes official when the S&P 500 hits a record closing high. A bear market is a 20% decline in the S&P 500 from close to close. It is only officially over when the market recovers back to a new closing high. The bull market leading up to the Corona market-crash started at the end of the Great Recession on 9 March 2009 with the S&P at 676.53. It lasted for almost 11 years reaching a peak on 19 February 2020 with the S&P at 3,386.15. The growth during this longest running bull market was 400.5% from 676.53 to 3,386.15.

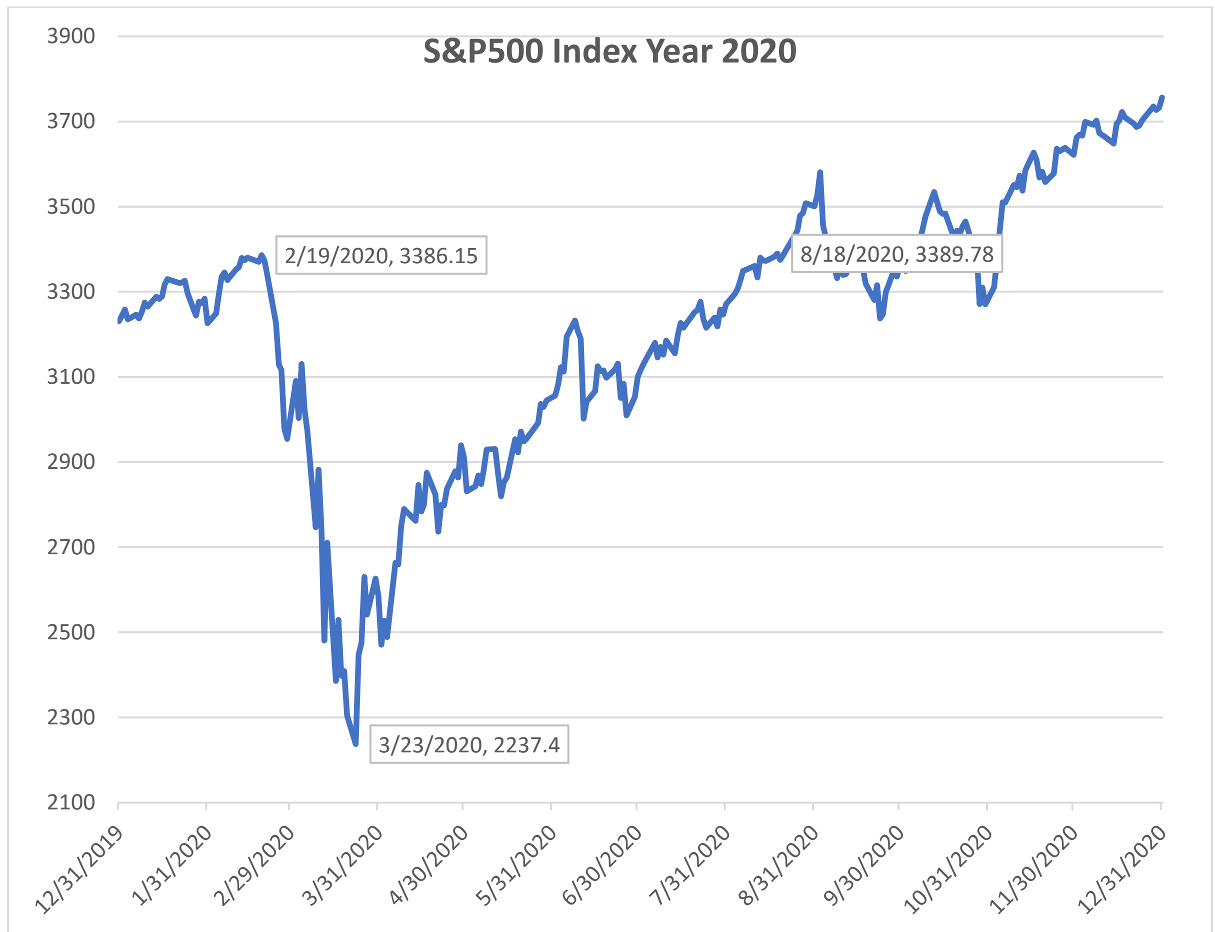


Source: Macrotrends.net **Error! Reference source not found.**.

Figure 1: S&P500 Index Year 2009 to February 2020

Figure 2 indicates the performance of the S&P500 Index for the year 2020. It started at 3,230.78, continued with the bull run and on19 February 2020 closed on an all-time high of

3,386.15. In a historical short time of 33 days it plunged to a bottom of 2,237.4 on 23 March 2020, wiping 33.9% from the highest point and 30.75% since the start of the year. The bear market was short lived as from there the market started to recover and on 18 August closed above the February 19 high, making it a bull market since March 23. That means that bottom of March 23 was the official end of the bear market and the start of the bull market.



Source: Macrotrends.net **Error! Reference source not found.**.

Figure 2: S&P500 Index Year 2020

During the historic bull run which started in 2009, only 2 years (2015 and 2018) posted negative returns on the S&P500 Index. The 2011 year ended neutral.

Table 1 Annual Performance of S&P500 Index

Year	Performance
2009	23.45%
2010	12.78%
2011	0%
2012	13.41%
2013	29.60%

2014	11.39%
2015	-0.73%
2016	9.54%
2017	19.42%
2018	-6.24%
2019	28.88%

Source: Macrotrends.net **Error! Reference source not found.**.

The Consumer Price Index (CPI) measures the average change in prices over time that consumers pay for a basket of goods and services, commonly known as inflation. The Bureau of Labor Statistic (BLS) is the American government agency tasked with collecting and disseminating the data. CPI data is released on a monthly basis and the BLS provides annual averages.

Table 2 Consumer Price Index

Year	**CPI**
2010	1.6%
2011	3.2%
2012	2.1%
2013	1.5%
2014	1.6%
2015	0.1%
2016	1.3%
2017	2.1%
2018	2.4%
2019	1.8%

Source: BLS **Error! Reference source not found.**.

3 METHODOLOGY

In order to determine how far did FIRE retirees' capital drawdown during the Corona market-crash the approach followed was to determine the different balances of an initial $1,000,000 entering the market at year end from 31 December 2009 to 31 December 2019. The portfolios were 100% invested in the stock market. The benchmark S&P 500 Index were used to represent performance. Initial investments were made on 31 December of the retirement year. For every $1,000,000 invested an additional amount of $40,000 (4% of $1,000,000) were kept in cash. Historical annual return data were used to calculate portfolio values after 4% inflation adjusted withdrawal at the end of every year. After the first year the 4% withdrawal rate is no longer used for compounding the amount withdrawn. The withdrawal amount is just adjusted with inflation. The annual average CPI data was used to determine the inflation.

To illustrate by way of an example. A 2009 retiree entered the market on 31 December 2009. For every $1,000,000 invested in his portfolio he kept $40,000 aside to pay for his living expenses during 2010. The S&P 500 increased with 12.78% in 2010. An initial $1,000,000 grew to $1,127,800. The inflation per CPI index were 1.6% in 2010. The

initial $40,000 is adjusted with 1.6% to ensure $40,640 withdrawal at year end for living expenses for the 2011 year. At the end of year 2010 the initial $1,000,000 had a balance of $1,087,160. ($1,000,000 + $127,800 - $40,640). In 2011 the closing balance of 2010, $1,087,160 was used as opening balance and adjusted with the S&P 500. Interesting is that 2011 was an exceptional year as the S&P 500 started and closed the year on the same point – resulting in no growth or loss. The 2010 withdrawal of $40,640 was then adjusted with CPI 3.2% to 41,940.48. This method is repeated for every year till the end of 2019. The same method is followed for the retirees of 2010 through to 2019.

The market bottomed on 23 March 2020 with the S&P 500 shedding 30.75% from 31 December 2019. For the crash data the 31 December balance were adjusted with the 30.75% drop. The inflation adjusted withdrawal was not taken into account as the retirees would still have cash available till the end of December.

4 RESULTS

Tables 3 and 4 presents the annual balances and the balance at the crash bottom of $1,000,000's invested. Table 3 indicates that at the crash, the retirees from 2009 to 2012 would all have more than their initial $1,000,000 capital. Table 4 shows that the retirees from 2013 to 2019 would all have balances smaller than $1,000,000. The first entry in the table indicates that a retiree of 2009 would have increased the initial $1,000,000 to $1,485,575 at the bottom of the crash. The balances generally decline steadily from top to bottom, or seen as investment time from 2009 to 2019. However, the balance of 2010 retiree is smaller than that of a 2011 retiree and so is 2014 /2015 as well as 2017 / 2018 reversed. The numbers imply the returns of 2011 (0%), 2015 (-0.73%) and 2018 (-6.24%) combined with the inflation adjusted withdrawal is responsible for this. During their first year of retirement the 2010, 2014 and 2017 retirees had their balances dropped below initial investment of $1,000,000.

Table 3 Year End and Crash Balances 2009 to 2012 Retirees

	2009	**2010**	**2011**	**2012**
2009	1,000,000			
2010	1,087,160	1,000,000		
2011	1,045,220	958,720	1,000,000	
2012	1,142,562	1,045,137	1,093,260	1,000,000
2013	1,437,297	1,311,719	1,375,412	1,255,400
2014	1,556,846	1,417,660	1,489,956	1,357,140
2015	1,501,278	1,363,804	1,436,921	1,305,942
2016	1,599,722	1,449,839	1,531,298	1,388,702
2017	1,864,670	1,686,399	1,785,073	1,615,682
2018	1,701,500	1,535,090	1,629,035	1,471,132
2019	2,145,235	1,931,516	2,054,047	1,851,477
Crash	1,485,575	1,357,575	1,422,428	1,282,148

Table 4 Year End and Crash Balances 2013 to 2019 Retirees

	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
2010							
2011							
2012							

2013	1,000,000						
2014	1,073,260	1,000,000					
2015	1,024,745	952,660	1,000,000				
2016	1,081,296	1,002,983	1,054,880	1,000,000			
2017	1,249,208	1,156,350	1,218,367	1,153,360	1,000,000		
2018	1,128,173	1,041,788	1,099,977	1,039,570	896,640	1,000,000	
2019	1,410,129	1,299,487	1,374,524	1,297,225	1,113,892	1,248,080	1,000,000
Crash	976,515	899,895	951,858	898,328	771,370	864,295	692,500

Figure 3 indicates the total gain or loss on an original $1,000,000. The investment made end of 2009, gained $485,575 whilst the investment made at end of 2019 lost $307,500. A difference of $793,075 on the same amount of $1,000,000 invested.

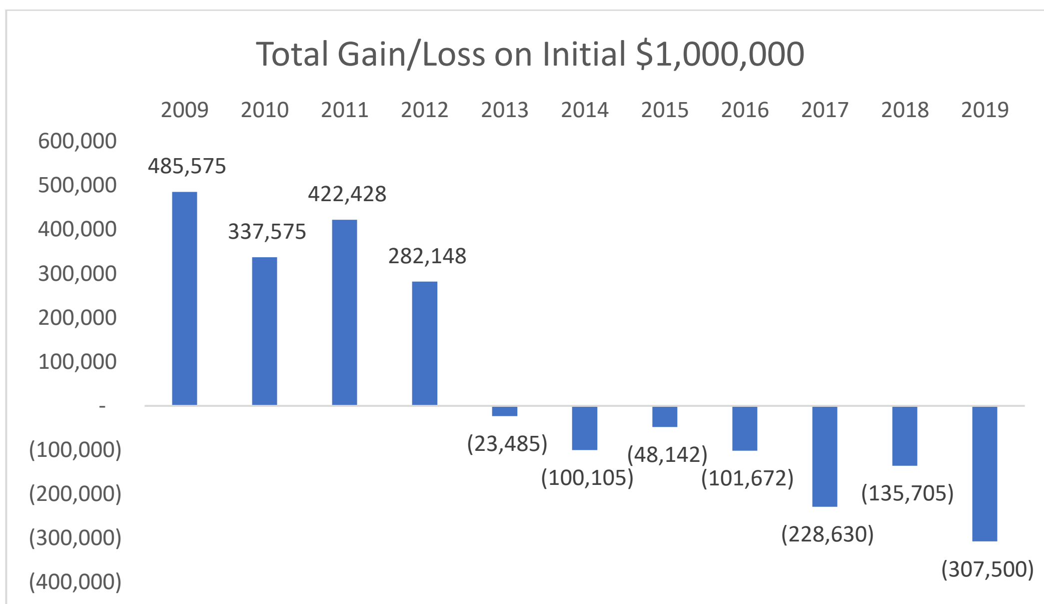


Figure 3: Total Gain / Loss on Initial $1,000,000

Figure 4 shows the loss per original $1,000,000 from the growth/withdrawal adjusted balances of 31 December 2019 to the lowest point of the crash. All balances dropped with 30.75% over 83 days. The 2009 retirees lost the most with $659,660 whilst the 2019 retirees lost the least with $307,500.

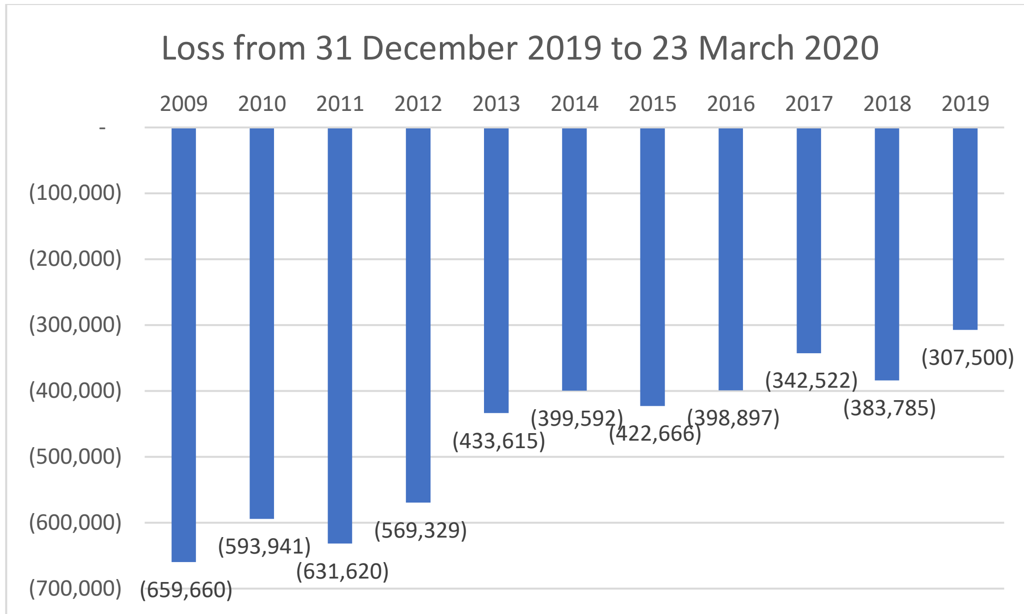


Figure 4: Loss from 31 December 2019 to 23 March 2020

In Figure 5 the relationship between the years retired and the percentage gain or loss over entire investment period till date of crash is displayed. Despite being retired for 10.25 years and making annual inflation adjusted withdrawals the 2009 retirees experienced capital growth of 48.6%. The retirees of 7 years and longer all experienced net capital gain whilst shorter retirees had to endure net capital loss. The 2019 retirees lost 30.75% in a mere 83 days after their initial retirement.

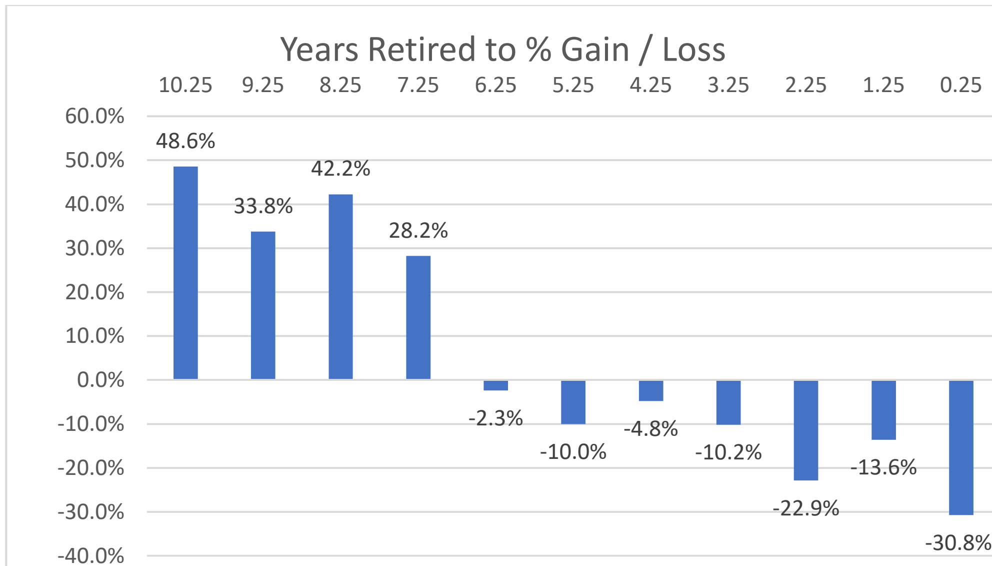


Figure 5: Years Retired to % Gain/Loss

5 CONCLUSION

The general trend is that those who were longer retired ended with higher amounts than those who enjoyed shorter retirements. At the market-crash the FIRE retirees of the first 4 years (2009 till 2012) using 4% inflation adjusted withdrawals all had their initial $1,000,000 capital plus growth. (Highest positive balance: 2009, $1,485,574, increase of 48.6%. Lowest positive balance: 2012, $1,282,147, increase 28.2%). The record bull run of 11 years

contributed largely to this. The more recent retirees from end 2013 onwards all had their initial $1,000,000 investment decreased to below initial capital invested. Particularly hard hit was the 2019 retirees who experienced a drop of 30.75% of their capital in the first 83 days of their retirement. Further studies can be done on how the market recovery indicated by Figure 2 changed the capital balances by year end 2020. It is also worth investigating if the market scare did actually send early retirees back to work.

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