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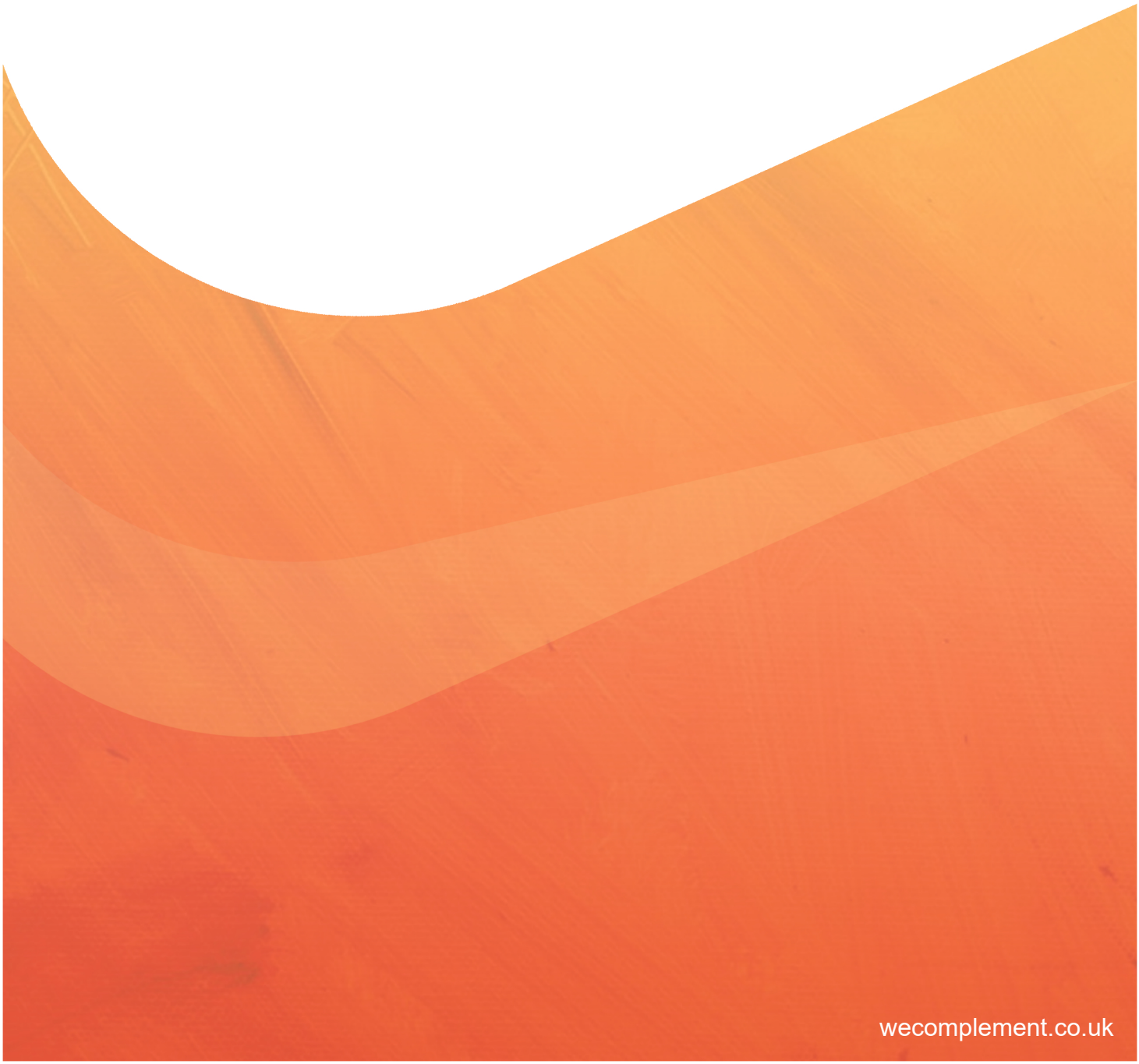
Safe Withdrawal Rates & The Research So Far: White Paper



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Executive Summary

In this white paper, I discuss and summarise William Bengen's research on the Safe Initial Portfolio Withdrawal Rate, with reference to his 1994, 1996 and 1997 work.

I also discuss and summarise Jonathan Guyton's research into the Safe Initial Portfolio Withdrawal Rate from 2004, his joint research with William Klinger in 2006, as well as Morningstar's 2023 research.

The 4% withdrawal rule is very well-known in the financial planning community, but the assumptions underlying this rule and how this figure was reached are discussed less often.

This paper discusses Bengen's further research on the 4% rule, as well as Guyton and Klinger's developments on this topic, and Morningstar's recent research. It aims to compile the research from various papers in one document that allows for an easy comparison of different bodies of work on the same subject. There has been some criticism of this research, but this is outside the scope of this paper for now.

Introduction

In the 90s, William Bengen published a series of papers that aimed to help advisers answer the age-old question posed to them by clients: “How much can I take from my pension each year without it running out?” The answer, according to Bengen, was that retirees can withdraw around 4% of their initial portfolio value in the first year of retirement, and then increase this withdrawal by inflation each year. Often known as the “4% rule”, this guidance has become incredibly well-known throughout the financial planning community and is still often cited today.

Jonathan Guyton and William Klinger sought to improve on this research, and in two papers, published in 2004 and 2006, they set out rules that can be applied to increase the safe withdrawal rate. They also tweaked two assumptions underlying Bengen’s research: how long a portfolio should be able to last in order for a withdrawal rate to be deemed ‘safe’, and the asset allocation of the portfolios used when determining this rate.

Guyton’s 2004 paper “Decision Rules and Portfolio Management for Retirees: Is the ‘Safe’ Initial Withdrawal Rate Too Safe?” expanded on Bengen’s work and established new guidelines, or ‘Decision Rules’ for working out a maximum safe initial withdrawal rate. Applying these rules could increase the safe initial withdrawal rate to as high as 5.8% or 6.2%, depending on the equity content of the portfolio.

In 2006, Guyton teamed up with William Klinger to publish a second paper, “Decision Rules and Maximum Initial Withdrawal Rates.” This paper uses Monte Carlo analysis to test the Decision Rules set out by Guyton in his 2004 paper and makes a few changes to come up with a final set of decision rules.

In November 2023, Morningstar published their most recent research on this topic in “The State of Retirement Income: 2023.” Since 2021, Morningstar have published an annual report showing their findings on safe initial withdrawal rates, as well as strategies that can be used to increase this. Morningstar’s research corroborates a safe withdrawal rate of 4.0%, though their findings on the optimal equity content differ from Bengen’s suggestion. Their methodology is also quite different from that used by Bengen, Guyton and Klinger, and will be discussed in this paper.

Before we take a look at each of these papers in more detail, I think it’s worth revisiting Bengen’s work and his 4% rule.

Revisiting the 4% Rule

Bengen first wrote about the 4% rule in his paper “Determining Withdrawal Rates Using Historical Data”, published in the Journal of Financial Planning in 1994. His research used historical investment data to determine the maximum ‘safe’ amount that retirees could withdraw from their portfolios, with ‘safe’ defined as an amount that would ensure that the portfolio didn’t run out for at least 30 years.

To do this, he considered 51 retirement scenarios, covering retirements starting on 1st January every year between 1926 and 1976. He used historic investment and inflation figures where possible and used average rates of return for any years in the future.

He also assumed that a retiree’s portfolio would be 50% invested in US common stocks and 50% invested in intermediate-term Treasury notes.

Looking at this data, he determined that, if a client had retired on 1st January in any year between 1926 and 1976, their portfolio would have lasted for at least 30 years if they had followed one simple rule: withdraw 4% of the value of their portfolio in the first year of retirement and increase this amount by inflation every year. It’s important to emphasise here that the 4% rule does not mean that a retiree can withdraw 4% of the current value of their portfolio every year; this 4% figure only relates to the starting value of the portfolio, and all other withdrawals are calculated by increasing the previous year’s withdrawal by the rate of inflation.

In all of the 51 scenarios that Bengen looked at, this method would never cause a portfolio to be exhausted before 33 years, and in most cases would lead to a portfolio lasting over 50 years.

This was the beginning of the 4% rule. Later in that same paper, Bengen explains that the same 4% rule applies to portfolios that have an equity allocation between 50% and 75%, which he considers to be the optimal range for retirement portfolios.

The 4% rule went on to be developed further, including in Bengen’s 1996 article “Asset Allocation for a Lifetime”, in which he confirms that all investors can use the same initial withdrawal rate of around 4.1%.

In his 1997 article “Conserving Client Portfolios During Retirement, Part III”, Bengen confirms that the safe withdrawal rate still holds true when his data set is expanded to cover clients retiring every quarter between 1st January 1926 and 1st January 1976, not just every year. In the same article, he confirms that including 30% U.S. small cap equities in the analysis (instead of just U.S. large cap equities as is the case in the initial analysis) means that the safe initial withdrawal rate can be increased from 4.1% to 4.3%.

2004 - Decision Rules and Portfolio Management for Retirees: Is the 'Safe' Initial Withdrawal Rate Too Safe? – Jonathan Guyton.

Towards the start of this paper, Guyton defines a 'safe initial portfolio withdrawal rate' (SIPWR) as the maximum rate that can achieve the following conditions:

1. Never requires a reduction in withdrawals from any previous year.

2. Allows for increases in withdrawals each year to offset inflation.

3. Maintains the portfolio's ability to satisfy points 1 and 2 for at least 40 years.

His aim for the paper is to establish a SIPWR that would have held up if a client retired in 1973 and lived for 40 years. He chose to study this period because there were two severe bear markets and a period of very high inflation between 1973 and 2003.

Returns and inflation between 1973 and 2003 are based on historic data, while returns for years 2004 onwards are assumed to be 3% above inflation on average.

Bengen's 4% rule was created based on a portfolio that is 50% invested in US equities (more specifically, large cap equities), with the remainder invested in intermediate-term Treasury notes. It was also based on a client living for 30 years after the date they retired. Guyton made some tweaks to this: he set out to consider how the SIPWR could be modified if you assume that the portfolio has to last at least 40 years (due to increasing longevity and increased time spent in retirement) and if the portfolio included different asset classes (as this is closer to what most financial planners would recommend for their clients). Specifically, the portfolios his research is based on include allocations to Cash, Fixed Income, U.S. Large Cap Value, U.S. Large Cap Growth, U.S. Small Cap Value, U.S. Small Cap Growth, International Equities, and REITs. He looked at two portfolios, one with 65% equity content and one with 80% equity content, based on his prescribed asset allocation. The remainder was assumed to be invested in fixed income assets and cash.

An obvious consequence of this more complex portfolio is that it becomes more difficult to choose where the retiree should make their withdrawals from. To help with this, Guyton created the following **Portfolio Management Decision Rules:**

Following years in which an equity asset class had a positive return that produced a weighting in excess of its target allocation, the excess allocation was "sold", and the proceeds invested in cash to meet future withdrawal requirements.

Portfolio withdrawals were funded each year on January 1 in the following order: (1) cash from rebalancing any overweighted equity asset classes from the prior year-end, (2) cash from rebalancing any overweighted fixed income assets from the prior year-end, (3) withdrawals from remaining cash, (4) withdrawals from remaining fixed income assets, (5) withdrawals from remaining equity assets in order of the prior year's performance.

No withdrawals were taken from an equity asset class following a year in which it had a negative return so long as cash or fixed income assets were sufficient to fund the withdrawal requirement.

Guyton found that using the Portfolio Management Decision Rules in conjunction with the recommended asset allocation led to an improvement on Bengen's SIPWR (based on a 30-year retirement).

Guyton was not satisfied with this. He wanted to improve the assumptions underlying a safe initial withdrawal rate to make them closer to what a real-life retiree might expect of a so-called 'safe' withdrawal rate. In particular, he only wanted to consider withdrawal rates that would preserve 100% of the portfolio's initial purchasing power or sustain 40 years of withdrawals. With these constraints in mind, the safe withdrawal rates for 65% and 80% equity portfolios (invested in line with the recommended multi-asset strategy and following the Portfolio Management Decision Rules) were as follows:

	"Safe" Initial Withdrawal Rates Under Portfolio Management Decision Rule	
Desired Portfolio Outcome	65% Equities	80% Equities
Portfolio Lasts 30 Years	4.7%	5.0%
Portfolio Funds 40 Years	4.4%	4.7%
12/2003 Value = Original Purchasing Power	3.6%	3.9%

Taken from "*Decision Rules and Portfolio Management for Retirees: Is the 'Safe' Initial Withdrawal Rate Too Safe?*", Jonathan T. Guyton, 2004 (Table 3)

As you can see, for a 65% equity portfolio, the SIPWR is 4.4% if the aim is to provide 40 years of withdrawals, or 3.6% if the aim is to maintain 100% of the portfolio's purchasing power by 2003. For an 85% equity portfolio, the SIPWR is 4.7% if the aim is to provide 40 years of withdrawals, or 3.9% if the aim is to maintain 100% of the portfolio's purchasing power by 2003.

Setting out to improve these rates, Guyton then investigated what would happen to the SIPWR if the client was willing to not increase their withdrawals by inflation after a bad year. To investigate this, he added the following **Withdrawal Decision Rule (1)** to his analysis:

There is no increase in withdrawals following a year in which the portfolio's ending value is less than its beginning value.

There is no make-up for a missed increase in any subsequent year.

This rule had a significant impact on the safe withdrawal rate. If the aim was to make sure the withdrawals were sustainable for 40 years, the safe withdrawal rate increased from 4.40% to 5.40% for a 65% equity portfolio, and 4.7% to 5.80% for an 80% equity portfolio. The downside, though, was that the client's income would be frozen quite often – in around 10 of their retirement years. In addition, the total withdrawals received over 30 years were significantly less than if this rule wasn't used.

Seeking to improve on this, Guyton replaced the previous Withdrawal Decision Rule with the **Withdrawal Decision Rule (2):**

There is no increase in withdrawals following a year in which the portfolio's total investment return is negative.

There is no make-up for a missed increase in any subsequent year.

With the updated Withdrawal Decision Rule, there are fewer years where the client would have to freeze their income. This is probably more palatable to most clients. The updated Withdrawal Decision Rule led to another interesting result: when looking at the SIPWR that will support a 40-year period, the total withdrawals received after 30 years were much closer to what they would have been without implementing this rule. This means that, while in some years a client's income might not increase by inflation, looking at their retirement as a whole (or at least the first 30 years) they might not receive much less income than if this rule wasn't implemented.

There is a small decrease in the SIPWR when compared to the impact of the first Withdrawal Decision Rule, but the trade-off is that, with the updated Withdrawal Decision Rule, overall withdrawals are significantly higher, and fewer income freezes are needed.

The next step was to look at inflation. An abnormally high period of inflation early in retirement can have a large impact on the total amount withdrawn from the portfolio. This is because any large increase in withdrawals at the start of retirement driven by high inflation has to be maintained throughout the rest of a client's retirement.

This can lead to the portfolio running out sooner (or alternatively the safe initial withdrawal rate decreasing). To help combat the impact inflation can have on a portfolio, Guyton introduced the following **Inflation Decision Rule:**

The maximum inflationary increase in any given year is six percent.

There is no make-up for a capped inflation adjustment in any subsequent year.

This rule also had a significant impact on the SIPWR. In particular, if the aim is to sustain withdrawals for 40 years, this rule allowed the Safe Initial Withdrawal Rate to rise from 4.4% to 5.1% in the 65% equity portfolio, and from 4.7% to 5.4% with the 80% equity portfolio.

Impact on the "Safe" Rate of Applying Withdrawal and Inflation Decision Rules (Assuming Retirement Date 1st January 1973)

Resulting Outcome	65% Equities	80% Equities
To Sustain Withdrawals for 40 Years		
"Safe" Initial Rate: No Rules Applied	**4.4%**	**4.7%**
"Safe" Initial Rate: Inflation Rule Only	5.1%	5.4%
"Safe" Initial Rate: WD Rule #2 Only	5.1%	5.7%
"Safe" Initial Rate: WD Rule #2 and Inflation Rule	5.8%	6.2%
To Preserve Purchasing Power After 31 Years		
"Safe" Initial Rate: No Rules Applied	3.6%	3.9%
"Safe" Initial Rate: Inflation Rule Only	4.2%	4.7%
"Safe" Initial Rate: WD Rule #2 Only	4.2%	4.8%
"Safe" Initial Rate: WD Rule #2 and Inflation Rule	4.8%	5.3%

Taken from "*Decision Rules and Portfolio Management for Retirees*: Is the 'Safe' Initial Withdrawal Rate Too Safe?", Jonathan T. Guyton, 2004 (Table 6)

The table above summarises the impact of the rules set out in the paper, and shows the impact on the SIPWR for a 65% and 80% equity portfolio when implementing the Decision Rules set out by Guyton. Note that all of these outcomes assume that the Portfolio Management Decision Rules are used, and that the equity allocation of these portfolios follows Guyton's recommended asset allocation.

As you can see, the Decision Rules have led to a significant increase in the SIPWR in all cases, with a SIPWR as high as 6.2% for an 80% equity portfolio that follows the Inflation Rule and Withdrawal Decision Rule 2!

2006 - Decision Rules and Maximum Initial Withdrawal Rate

In 2006, alongside William Klinger, Jonathan Guyton returned to his Decision Rules. In this paper, they use Monte Carlo simulations to test the 2004 Decision Rules. They look at the 1973-2004 period (to match what Guyton used in his 2004 paper), but also look at the 1928-2004 period for a wider range of data.

In this paper, Guyton and Klinger look at the trade-offs between initial withdrawal rates and the probability that the withdrawals will be sustainable throughout retirement, and also look at the purchasing power of the withdrawals. They also comment on how to rescue a portfolio that could be in danger of running out, and how to identify such a portfolio.

Like the 2004 paper, they assumed a client would rely on their portfolio for 40 years in retirement. As well as considering an 80% and 65% equity portfolio, they also looked at a 50% equity portfolio. Each of these portfolios is invested in line with the recommended asset allocation set out in Guyton's 2004 paper.

Something that comes up frequently in this paper is the 'probably of success', which is defined as "the percentage of simulated lifetimes where the retiree's portfolio contained at least $1 at the conclusion of the distribution period". Generally, they consider a 95% probability of success to be the minimum acceptable level.

One of the first changes recommended in this paper is an update to the Withdrawal Decision Rule 2 from Guyton's 2004 paper. The **Updated Withdrawal Decision Rule** is as follows:

Withdrawals increase from year to year in accordance with the inflation rule, except that there is no increase following a year where the portfolio's total return is negative and when that year's withdrawal rate would be greater than the initial withdrawal rate.

There is no make-up for a missed increase.

The reason for modifying this rule was that, according to Guyton and Klinger, it's unnecessary to freeze a portfolio in a year where returns are negative, but the current withdrawal rate is still below the initial withdrawal rate.

This modification generates around 60% fewer income freezes but has a small impact on the SIPWR when compared to the Withdrawal Decision Rule 2 from the 2004 paper. This is still an improvement on the original SIPWR (without any of the Decision Rules applied), so Guyton and Klinger adopt this Updated Withdrawal Decision Rule for the rest of the paper.

The next step was to look at the failed scenarios that were generated by the Monte Carlo simulation and see if they have anything in common. This could provide useful insight into why a portfolio might fail. Guyton and Klinger identified some red flags to look out for that might suggest a client's portfolio might not last. They found that 55% of all failures took place in the third decade of retirement, and that failures are most likely to occur when there are unusually bad inflation rates or investment returns —either in magnitude, duration or both —relatively early in retirement.

They suggested that, to reduce the possibility of failure at a given initial withdrawal rate, a retiree could reduce their portfolio withdrawals under certain circumstances.

Based on this, they introduced the **Capital Preservation Rule**. This rule aims to rescue a portfolio that might be in trouble and help sustain it throughout the remainder of a 40-year retirement. The rule is defined as follows:

The capital preservation rule applies when a current year's withdrawal rate has risen more than 20 percent above the initial withdrawal rate.

The capital preservation rule expires 15 years before the maximum age to which the retiree wishes to plan; for example, a retiree assuming she would not live beyond age 100 would discontinue the capital preservation rule after age 85.

Under the capital preservation rule, the current year's withdrawal is reduced by 10 percent. The other decision rules in effect are then applied to this decreased withdrawal amount.

This decreased withdrawal becomes the basis for determining the following year's withdrawal amount.

They also introduced a **Prosperity Rule**:

The prosperity rule applies in years with a withdrawal rate more than 20 percent below the initial withdrawal rate.

Under the prosperity rule, the current year's withdrawal is increased by 10 percent. The other decision rules in effect are then applied to this increased withdrawal amount.

This increased withdrawal amount becomes the basis for determining the next year's withdrawal.

These two rules have since become known as the 'guardrails.'

They then tested the impact of applying the guardrails along with the Portfolio Management and Withdrawal Rules. While testing these rules, they determined that removing the Inflation Rule didn't reduce the probability of success, but it increased the purchasing power maintained by more than 10%. Because of this, they removed the Inflation Rule from the Decision Rules and replaced it with the guardrails.

Guyton and Klinger found that, with the introduction of the guardrails, it's possible to increase the SIPWR with a 100% success rate. A retiree's greatest concern then shifts from whether their portfolio will last, to what will happen to their purchasing power.

The table below shows the SIPWR for various probabilities of success when implementing the guardrails alongside with Withdrawal Rule and Portfolio Management Rule. It also shows the average number of cuts and raises to income, as well as the purchasing power maintained.

Impact of Capital Preservation and Prosperity Rules on Success and Purchasing Power with Multi-Class Equities

65% Multi-Class Equities	Initial WD[1] Rate	Avg. # of Cuts/ Raises	% Total PP[2] Maintained	% Initial PP In Year 40 WD
PMR[3], WR[4], CPR[5] Only				
100% Success	6.3%	1 / NA	90%	87%
99% Success	7.0%	2 / NA	86%	81%
98% Success	7.2%	2 / NA	85%	79%
95% Success	7.9%	3 / NA	80%	73%
90% Success	8.4%	3 / NA	77%	67%
PMR, WR, CPR PR[6]				
100% Success	6.3%	1 / 3	93%	97%
99% Success	7.1%	2 / 3	88%	90%
98% Success	7.3%	2 / 2	88%	86%
95% Success	7.8%	3 / 2	84%	80%
90% Success	8.4%	3 / 2	79%	73%

[1]WD = withdrawal; [2]PP = purchasing power; [3]PMR = portfolio management rule; [4]WR = withdrawal rule; [5]CPR = capital preservation rule; [6]PR = prosperity rule

Taken from "*Decision Rules and Maximum Initial Withdrawal Rates*" by Jonathan T. Guyton and William J Klinger, 2006. Table 4.

Towards the end of the paper, Guyton and Klinger summarise the **four Decision Rules** that make up the decision rules going forward:

The Portfolio Management Rule.

The Withdrawal Rule.

The Capital Preservation Rule & Prosperity Rule (the guardrails).

They state that each retiree's needs and wants should be considered when choosing which of the decision rules to apply. There are trade-offs to be made with the decision rules, and each retiree will feel differently about what they're willing to accept.

Table 6 below shows the maximum initial withdrawal rates and corresponding success rates for a 40-year withdrawal period at various equity allocations. Each scenario applies the four Decision Rules.

40-Year Withdrawal Rates with High Success and Purchasing Power Maintenance Using Portfolio Management Rule, Withdrawal Rule, Capital Preservation Rule, and Prosperity Rule

	Confidence Standard	Initial WD[1] Rate	Success Rate	Avg. # of 'Triggers' Cuts/Freez-es/Raises	Total PP%[2]	Year 40 PP%
One Equity (S&P 500)						
50/40/10	99%	4.5%	100%	3 / 7 / 7	100%	108%
	95%	4.8%	100%	3 / 8 / 7	95%	97%
	90%	5.0%	100%	3 / 8 / 6	92%	91%
65/25/10	99%	5.2%	99%	4 / 8 / 9	102%	114%
	95%	5.7%	97%	4 / 9 / 8	95%	98%
	90%	6.0%	95%	4 / 9 / 8	90%	91%
80/10/10	99%	4.7%	99%	3 / 8 / 13	129%	178%
	95%	5.6%	95%	4 / 8 / 11	110%	135%
	90%	6.3%	90%	5 / 9 / 10	99%	112%
Multi-Class Equities						
50/40/10	99%	4.6%	100%	2 / 5 / 6	99%	103%
	95%	4.8%	100%	2 / 5 / 5	97%	101%
	90%	5.1%	100%	2 / 5 / 5	92%	90%
65/25/10	99%	5.3%	100%	2 / 6 / 7	100%	106%
	95%	5.5%	99%	3 / 6 / 7	96%	98%
	90%	5.8%	99%	3 / 7 / 6	92%	90%
80/10/10	99%	5.6%	99%	3 / 7 / 9	101%	113%
	95%	6.2%	95%	4 / 7 / 8	96%	96%
	90%	6.3%	94%	4 / 7 / 8	93%	93%

[1]WD = withdrawal; [2]PP = purchasing power

Taken from "*Decision Rules and Maximum Initial Withdrawal Rates*" by Jonathan T. Guyton and William J Klinger, 2006. Table 6.

The table above also shows the 'confidence standard' for these withdrawal rates. Guyton and Klinger state that the confidence standard chosen should be determined by the client's needs:

The 99% confidence standard should be chosen for retirees seeking a virtually "bullet-proof" withdrawal plan. This corresponds to an initial withdrawal rate where the probability of success and the median purchasing power maintained are both at least 99 percent.

The 95% confidence standard should be chosen for retirees who want a higher initial withdrawal rate and are willing to accept a small amount of risk. This corresponds to an initial withdrawal rate where the probability of success and the median purchasing power maintained are both at least 95 percent.

Table 6 above shows a few things:

The safe initial withdrawal rates for portfolios with 50% equities are noticeably lower than the rates in portfolios with greater equity content.

The greater the equity allocation, the more raises received due to the prosperity rule; these raises occur more frequently than the cuts under the capital preservation rule.

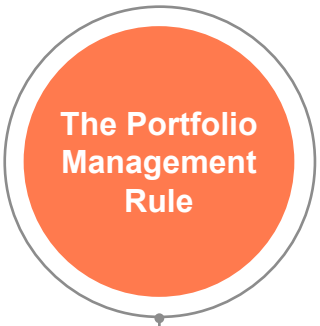
Withdrawal reductions from the capital preservation rule occur no more than 10 percent of the time at very high probabilities of success.

Overall, this paper shows that using the Decision Rules can have a significant impact on the SIPWR. The results were consistent with Guyton's previous research.

In addition, the application of the guardrails virtually eliminates the possibility of a retiree running out of money at these initial withdrawal rates.

There is no one-size-fits-all SIPWR as every retiree has different needs and is willing to accept different levels of security. Using the Decision Rules, a 65% equity portfolio invested in line with Guyton's recommended equity allocation has a 99% confidence standard at a 5.3% initial withdrawal rate. An 80% equity portfolio has a 99% confidence standard at a 5.6% initial withdrawal rate. These safe initial withdrawal rates increase if the client is willing to tolerate a little bit more uncertainty with regards to the success rate or purchasing power of their withdrawal strategy.

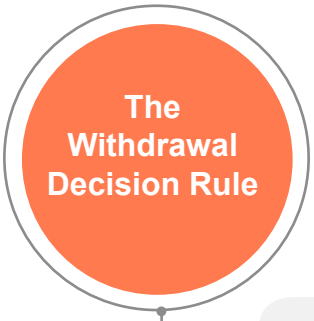
The final decision rules, as summarised in this paper, are as follows:



No withdrawals were taken from an equity asset class following a year in which it had a negative return so long as cash or fixed income assets were sufficient to fund the withdrawal requirement.

Portfolio withdrawals were funded each year on January 1 in the following order: (1) cash from rebalancing any overweighted equity asset classes from the prior year-end, (2) cash from rebalancing any overweighted fixed income assets from the prior year-end, (3) withdrawals from remaining cash, (4) withdrawals from remaining fixed income assets, (5) withdrawals from remaining equity assets in order of the prior year's performance.

Following years in which an equity asset class had a positive return that produced a weighting in excess of its target allocation, the excess allocation was "sold", and the proceeds invested in cash to meet future withdrawal requirements.



Withdrawals increase from year to year with inflation, except that there is no increase following a year where the portfolio's total return is negative and when that year's withdrawal rate would be greater than the initial withdrawal rate.

There is no make-up for a missed increase.

The Capital Preservation Rule

The capital preservation rule applies when a current year's withdrawal rate—using the decision rules in effect—has risen more than 20 percent above the initial withdrawal rate.

Under the capital preservation rule, is the current year's withdrawal is reduced by 10 percent. The other decision rules in effect are then applied to this decreased withdrawal amount.

The capital preservation rule expires 15 years before the maximum age to which the retiree wishes to plan; for example, a retiree assuming she would not live beyond age 100 would discontinue the capital preservation rule after age 85.

This decreased withdrawal becomes the basis for determining the following year's withdrawal amount.

The Prosperity Rule

The prosperity rule applies in years with a withdrawal rate more than 20 percent below the initial withdrawal rate.

Under the prosperity rule, the current year's withdrawal is increased by 10 percent. The other decision rules in effect are then applied to this increased withdrawal amount.

This increased withdrawal amount becomes the basis for determining the next year's withdrawal.

2023 - Morningstar's "The State of Retirement Income:2023"

In November 2023, Morningstar published their most recent research into the safe initial withdrawal rate. The research summary states that the starting safe withdrawal rate is 4%, though after delving into the research a bit deeper it doesn't feel right to compare this number directly with Bengen, Guyton and Klinger's safe withdrawal rates. There are some significant differences between the methodology Morningstar used to arrive at their 4% figure, and how the previous researchers mentioned (Bengen, Guyton and Klinger) arrived at their figures. Later in the same paper, Morningstar tweak their methodology and assumptions slightly, and come up with another figure for a safe initial withdrawal rate that is a more suitable like-for-like comparison with previous work. This figure is significantly higher than 4%.

So how did Morningstar arrive at the 4% figure? First, they gathered some forward-looking assumptions for volatility, inflation and asset class returns from Morningstar Investment Management. They then used these assumptions to extrapolate 30-year forecasts, meaning that this research is not an analysis using historical returns, unlike previous research I've covered in this white paper.

In this forward-looking analysis, Morningstar looked at portfolios varying between 100% equities to 0% equities, in 10% increments. They assume a diversified basked of investments within each asset class, where any equity content in a portfolio will be split as follows: 30% in U.S. large-growth stocks, 30% in U.S. large-value stocks, 20% in foreign stocks, 10% in U.S. small-growth stocks, and 10% in U.S. small-value stocks. The fixed-income portion in their portfolios consists of 80% in U.S. bonds and 20% in non-U.S. bonds. Each portfolio holds a 10% cash position, except for the 100% stock portfolio. Morningstar used Monte Carlo simulations to vary the sequence of potential investment returns, which created 1,000 hypothetical return patterns for each asset class combination.

Morningstar then used this information to calculate the highest possible withdrawal rate with a 90% success rate (i.e., at least 900 of the 1,000 trials do not run out before the end of the 30 years). They found that the safe initial withdrawal rate was 4.0% for a portfolio with 40% equity content and 3.9% for a portfolio with 50% equity content. Morningstar did very similar research in 2022 (just with different forward-looking assumptions) and arrived at a safe withdrawal rate of 3.8% for 40% and 50% equity portfolios. The reason these figures have increased this year is because Morningstar Investment Management's assumptions have changed, particularly with regards to the long-term inflation outlook.

Using this research, Morningstar found that the highest safe withdrawal rates came from equity allocations of 20-40%, which contradicts some of the research we looked at previously in this paper.

Morningstar also looked at a 40-year retirement period, which was the period used by Guyton in his research. This lowers the SWR to 3.4% for a 50% equity portfolio.

Morningstar go on to say that they're aware that their assumptions are conservatively generated, and equity return assumptions used are below historical averages. They mention that, if they do the same research use long-term historical averages (data from 1926-2022) rather than future assumptions, the safe withdrawal rate is increased to 4.5% for a 50% equity portfolio and 4.7% for a 70% portfolio. This is interesting as this method of determining the safe withdrawal rate is closer to the methods used in other research I've covered in this white paper, which all used historical averages.

Morningstar also looked at methods that could be used to increase the SWR, building on the rates they calculated using their forward-looking analysis (4.0% for a portfolio with 40% equity content and 3.9% for a portfolio with 50% equity content). They looked at four methods: forgoing inflation adjustments following a year in which the portfolio declined in value; using a 'required minimum distribution' (RMD) in which the portfolio value is divided by life expectancy so it is designed to ensure that portfolio will never be depleted (as the withdrawal is always a percentage of the remaining balance); guardrails (if the withdrawal percentage falls below 20% of its initial level, increase withdrawal by inflation plus 10%; if withdrawal is 20% above its initial level, cut spending by 10%); and spending declines in line with historical data.

Again, they were seeking a 90% success rate over a 30-year retirement period and used Monte Carlo simulations to help with their analysis. They mainly looked at 40% equity portfolios, though also considered other allocations. The following table is 'exhibit 11' from Morningstar's paper, and is a very useful summary of their findings on the base safe withdrawal rate (using forward looking analysis) as well as how these can be improved by implementing various methods.

Exhibit 11

30-Year Starting Safe Withdrawal Rate % by Withdrawal Method and Asset Allocation, 90% Success Rate

	Base Case	Forgo Inflation Adjustment	RMD	Guardrails	Actual Spending
100% Equities	3.3	3.8	4.4	**4.9**	4.2
90% Equities	3.5	4.0	4.4	**5.1**	4.4
80% Equities	3.7	4.1	4.4	**5.4**	4.6
70% Equities	3.8	4.2	4.4	**5.5**	4.7
60% Equities	3.9	4.3	4.4	**5.5**	4.8
50% Equities	3.9	4.4	4.4	**5.3**	4.9
40% Equities	4.0	4.4	4.4	**5.2**	5.0
30% Equities	4.0	4.4	4.4	**5.0**	**5.0**
20% Equities	4.0	4.3	4.4	4.8	**5.0**
10% Equities	3.9	4.2	4.4	4.6	**4.9**
0% Equities	3.6	4.0	4.4	4.5	**4.6**

As you can see, the guardrails method shows the largest improvement for portfolios containing between 30% and 100% equities, while the actual spending method shows the largest improvement for portfolios containing between 0% and 30% equities. These figures are bolded in the table above.

Morningstar go on to explore some other factors that may need to be considered when setting out a retirement income plan for a client: the average annual withdrawal rate over the 30-year period, the average value of the portfolio after 30 years, and how much the withdrawals vary on a year-to-year basis. Depending on the client's objectives, some or all of these factors can be just as important, or more important, than having a high starting withdrawal rate.

While the guardrails method leads to decent improvements in the SWR, it can also lead to a large variation in the yearly withdrawals. It also generally leads to a lower portfolio value after 30 years than the base case.

Summary

There has been a lot of research done into the topic of sustainable withdrawal rates, and this paper only looks at a small amount of that research. Even so, there are significant differences between the sustainable withdrawal rates that are arrived at in the research we have looked at. This difference is generally due to changes in the assumptions used, so it's important to understand how these figures were reached so you can decide whether you're comfortable with the methodology.

The attached table summarises various different safe withdrawal rates that were calculated by the research quoted in this paper. This allows for a quick comparison of the assumptions used to calculate the rates. This table only scratches the surface, and I would recommend reading the research for a better explanation of how these figures were arrived at, and why certain assumptions were used.

References

"Determining Withdrawal Rates Using Historical Data" by William P. Bengen. Published in the Journal of Financial Planning in 1994.

"Asset Allocation for a Lifetime" by William P. Bengen. Published in the Journal of Financial Planning in 1996.

"Conserving Client Portfolios During Retirement, Part III" by William P. Bengen. Published in the Journal of Financial Planning in 1997.

"Decision Rules and Portfolio Management for Retirees: Is the 'Safe' Initial Withdrawal Rate Too Safe?" by Jonathan T. Guyton. Published in the Journal of Financial Planning in 2004.

"Decision Rules and Maximum Initial Withdrawal Rates" by Jonathan T. Guyton and William J. Klinger. Published in the Journal of Financial Planning in 2006.

"The State of Retirement Income:2023" published by Morningstar, November 2023.

Research Summary

	Safe Withdrawal Rate	Retirement Period	Probability of Success	Inflation, return and volatility	Stochastic Modelling	Equity Content	Asset Class Diversification
Morningstar 2023	4.0%, though this could be improved by applying some rules, as follows: -4.4% by forgoing inflation adjustment - 4.4% using 'required minimum distributions' - 5.2% by using guardrails - 5.0% by assuming spending declines in line with historical data	30 years	90%	Assumptions based on predictions made by Morningstar Investment Management	Yes – 1,000 Monte Carlo simulations	40%	Equities: 30% in U.S. large-growth stocks, 30% in U.S. large-value stocks, 20% in foreign stocks, 10% in U.S. small-growth stocks, and 10% in U.S. small-value stocks. Fixed income: 80% in U.S. bonds and 20% in non-U.S. bonds. Other: 10% cash.
	3.9%, though this could be improved by applying some rules, as follows: -4.3% by forgoing inflation adjustment - 4.4% using 'required minimum distributions' - 5.5% by using guardrails - 4.8% by assuming spending declines in line with historical data	30 years	90%	Assumptions based on predictions made by Morningstar Investment Management	Yes – 1,000 Monte Carlo simulations	60%	Equities: 30% in U.S. large-growth stocks, 30% in U.S. large-value stocks, 20% in foreign stocks, 10% in U.S. small-growth stocks, and 10% in U.S. small-value stocks. Fixed income: 80% in U.S. bonds and 20% in non-U.S. bonds. Other: 10% cash.
	4.6%	30 years	90%	Based on 1926-2022 data	Yes – 1,000 Monte Carlo simulations	60%	Equities: 30% in U.S. large-growth stocks, 30% in U.S. large-value stocks, 20% in foreign stocks, 10% in U.S. small-growth stocks, and 10% in U.S. small-value stocks. Fixed income: 80% in U.S. bonds and 20% in non-U.S. bonds. Other: 10% cash.
Guyton & Klinger 2006	4.6%. This corresponds to a 99% confidence interval, though various confidence intervals are looked at. This is based on using the rules set out in the paper.	40 years	100%	Returns and inflation are based on historic data taken from 1928-2004	Yes – Monte Carlo simulations	50%	As per Guyton's 2004 work. Includes allocations to Cash, Fixed Income, U.S. Large Cap Value, U.S. Large Cap Growth, U.S. Small Cap Value, U.S. Small Cap Growth, International Equities, and REITs.
	5.3%. This corresponds to a 99% confidence interval, though various confidence intervals are looked at. This is based on using the rules set out in the paper.	40 years	99%	Returns and inflation are based on historic data taken from 1928-2004	Yes – Monte Carlo simulations	65%	As per Guyton's 2004 work. Includes allocations to Cash, Fixed Income, U.S. Large Cap Value, U.S. Large Cap Growth, U.S. Small Cap Value, U.S. Small Cap Growth, International Equities, and REITs.
	5.6%. This corresponds to a 99% confidence interval, though various confidence intervals are looked at. This is based on using the rules set out in the paper.	40 years	94%	Returns and inflation are based on historic data taken from 1928-2004	Yes – Monte Carlo simulations	80%	As per Guyton's 2004 work. Includes allocations to Cash, Fixed Income, U.S. Large Cap Value, U.S. Large Cap Growth, U.S. Small Cap Value, U.S. Small Cap Growth, International Equities, and REITs.
Guyton 2004	4.4%, though this could be improved by applying some rules, as follows: - 5.1% by following the inflation rule - 5.1% by following the withdrawal decision rule 2 - 5.8% by following both rules	40 years	100%	Returns and inflation between 1973 and 2003 are based on historic data, while returns for years 2004 onwards are assumed to be 3% above inflation on average.	No - Guyton looked at a client retiring in 1973 and living for 40 years	65%	Includes allocations to Cash, Fixed Income, U.S. Large Cap Value, U.S. Large Cap Growth, U.S. Small Cap Value, U.S. Small Cap Growth, International Equities, and REITs.
	4.7%, though this could be improved by applying some rules, as follows: - 5.4% by following the inflation rule - 5.7% by following the withdrawal decision rule 2 - 6.2% by following both rules	40 years	100%	Returns and inflation between 1973 and 2003 are based on historic data, while returns for years 2004 onwards are assumed to be 3% above inflation on average.	No - Guyton looked at a client retiring in 1973 and living for 40 years	80%	Includes allocations to Cash, Fixed Income, U.S. Large Cap Value, U.S. Large Cap Growth, U.S. Small Cap Value, U.S. Small Cap Growth, International Equities, and REITs.
Bengen 1994	4.0%	30 years	100%	Historical data where possible; average rates of return for any years in the future	No – Bengen looked at 51 scenarios (retirement on 01.01.26 – 01.01.76)	50%, though Bengen confirms the 4% rule applies to 50-75% equity portfolios	Equities: All invested in US common stocks Fixed income: All invested in intermediate-term Treasury notes
Bengen 1997	4.1%	30 years	100%	Historical data where possible; average rates of return for any years in the future	No – Bengen looked at retirements starting every quarter from 01.01.26 to 01.01.76	50%, though Bengen confirms the 4% rule applies to 50-75% equity portfolios	Equities: All invested in US common stocks Fixed income: All invested in intermediate-term Treasury notes
	4.3%	30 years	100%	Historical data where possible; average rates of return for any years in the future	No – Bengen looked at retirements starting every quarter from 01.01.26 to 01.01.76	63%	Equities: 70% US common stocks, 30% U.S. small cap equities Fixed income: All invested in intermediate-term Treasury notes