

A Comparison Study of Retirement Income Bucket Strategies

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Bucket Strategies in Literature

- Cash Flow Reserve (CFR) Bucket Strategy
 - Pfeifer et al. (2013)
- Time Bucket Strategy
 - Morgan Stanley(2010), Pfau(2017)
- Goal-based Bucket Strategy
 - Merrill Lynch (2009)
- Benefit of bucket strategies
- No well-established guideline
- Actual implementation differ significantly

Decision Steps of Bucket Strategies

Bucket Initiation

of Buckets, purpose and initial asset allocation

Strategies:

- **One cash flow reserve(CFR) bucket for near-term spending and the rest portfolio in a total-return bucket**
- **Each (time) bucket created to fund the financial needs in different time periods**
- **Each (goal) bucket created to fund one financial goal**

Decision Steps of Bucket Strategies

Bucket Initiation	Bucket Maintenance
<p># of Buckets, purpose and initial asset allocation</p> <p>Strategies:</p> <ul style="list-style-type: none"> • One cash flow reserve(CFR) bucket for near-term spending and the rest portfolio in a total-return bucket • Each (time) bucket created to fund the financial needs in different time periods • Each (goal) bucket created to fund one financial goal 	<p>Either</p> <p>Use latter buckets to replace and retire former buckets</p> <ul style="list-style-type: none"> • Underlying assets remain in the original buckets <p>Or first bucket remains and be refilled systematically</p> <ul style="list-style-type: none"> • Automatic refill • Income approach • Rebalance approach • Market-based/opportunistic approach • Personalized approach

Decision Steps of Bucket Strategies

Bucket Initiation	Bucket Maintenance	Asset Allocation Maintenance
<p># of Buckets, purpose and initial asset allocation</p> <p>Strategies:</p> <ul style="list-style-type: none"> • One cash flow reserve(CFR) bucket for near-term spending and the rest portfolio in a total-return bucket • Each (time) bucket created to fund the financial needs in different time periods • Each (goal) bucket created to fund one financial goal 	<p>Either</p> <p>Use latter buckets to replace and retire former buckets</p> <ul style="list-style-type: none"> • Underlying assets remain in the original buckets <p>Or first bucket remains and be refilled systematically</p> <ul style="list-style-type: none"> • Automatic refill • Income approach • Rebalance approach • Market-based/opportunistic approach • Personalized approach 	<p>Asset Allocation to Safer Assets</p> <ul style="list-style-type: none"> • Update to match the changing time horizon along time • No update <p>Rebalance</p> <ul style="list-style-type: none"> • No rebalance • Automatic rebalance • Market-based/opportunistic rebalance

Research Agenda

- **Strategies in Comparison**
 - Cash Flow Reserve (CFR) Bucket Strategy
 - Time Bucket Strategy
 - Goal-based Bucket Strategy
- **Performance Metrics**
 - Sustainable Spending Amount
 - Distribution of Portfolio Ending Balance
 - Sequence Risk Management
 - Tolerance of Transaction Cost
 - Consequence of Investor Over-reaction

Case Assumptions

- Age 65 with 30 years' retirement horizon
- 2 million dollars financial assets, cost basis is 1 million
- Moderate risk tolerance level
- Other goals

Expected Cash Outflow	Expected Month
Travel \$10,000	Month 1,12,24,36,48,73,98
Education \$33,598	Month 120
Education \$34,606	Month 132
Education \$35,644	Month 144
Education \$36,713	Month 156

Case Assumptions

- \$120 Transaction cost/ reposition
- Marginal tax rate: 33%
- LTCG rate: 15%

Multivariate Lognormal Asset Return Assumptions

	Arithmetic Mean (Real Return)	Standard Deviation	Correlation		Capital Gain	Ordinary Income
			Equity	Bond		
Equity	5.10%	20%	1	0.1	70%	30%
Bond	0.30%	7%	0.1	1	30%	70%

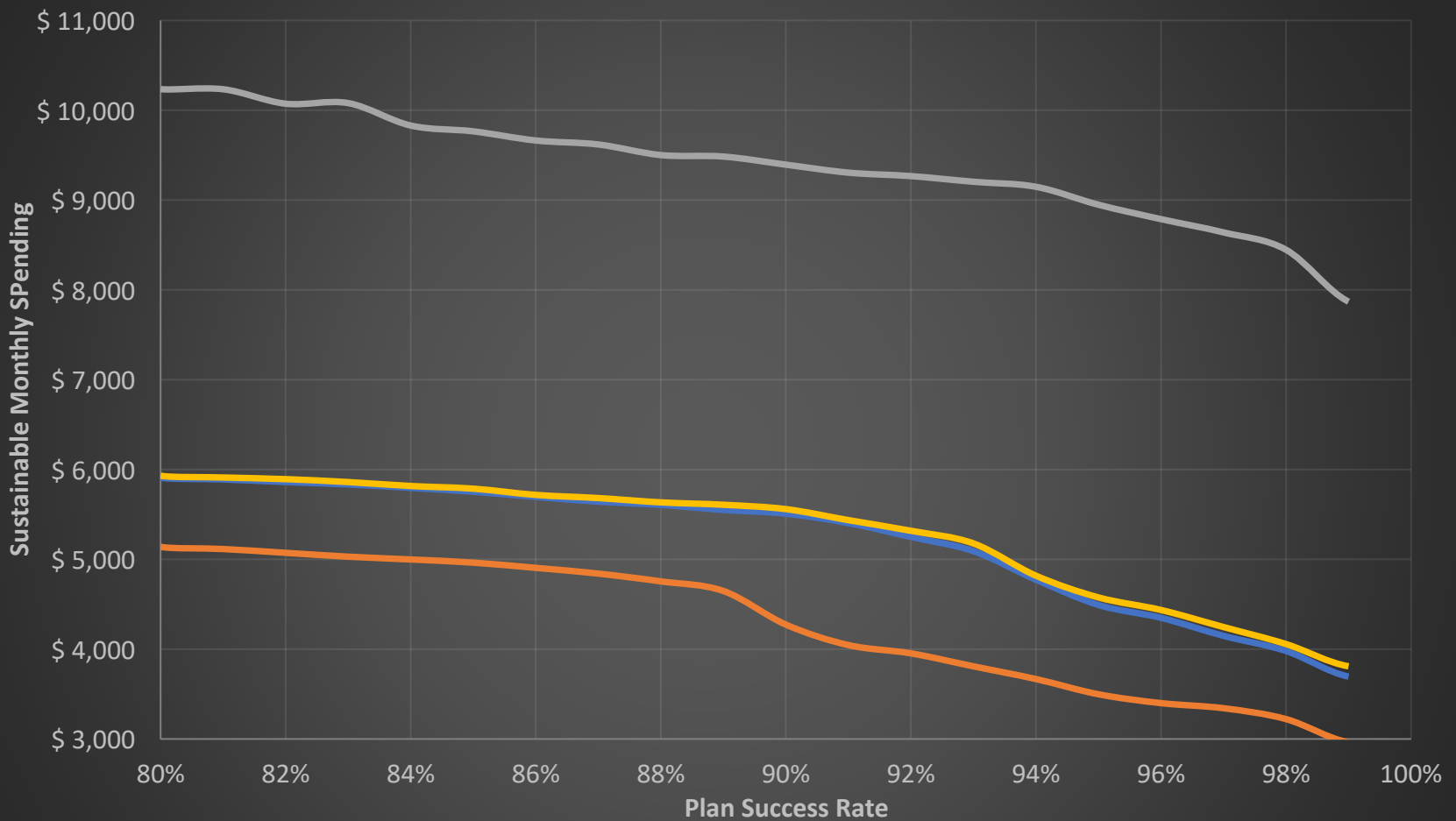
Strategies in Comparison

Systematic Withdraw	CFR Bucket	Time Bucket	Goal-based Bucket
<ul style="list-style-type: none"> • 60%/40% • Rebalance at 5% deviation • Monthly liquidation 	<ul style="list-style-type: none"> • 1st Bucket: Cash for 1 year • 2nd Bucket: 60%/40% • Rebalance at 5% deviation • 1st Bucket Refill when ≤ 2 month's income, conditionally 	<ul style="list-style-type: none"> • 1st Bucket: 100% bond(5y) • 2nd Bucket: 50%/50% (5y) • 3rd Bucket: 100% (10y) • No rebalance • Retire and replace 	<ul style="list-style-type: none"> • 1st Bucket: Travel, cash • 2nd Bucket: Education, 50%/50% • 3rd Bucket: Retirement, 60%/40% • Rebalance • Monthly liquidation

Qualitative Comparison

Criteria for comparison	Systematic Withdraw	Cash Reserve Bucket	Time Bucket Strategy	Goal Bucket Strategy
Clear asset allocation	Yes	Yes	No	No
Consistent asset allocation to risk tolerance	Yes	Yes	No	Yes
Opportunity costs	No	Moderate	Moderate	Yes

Base Strategies

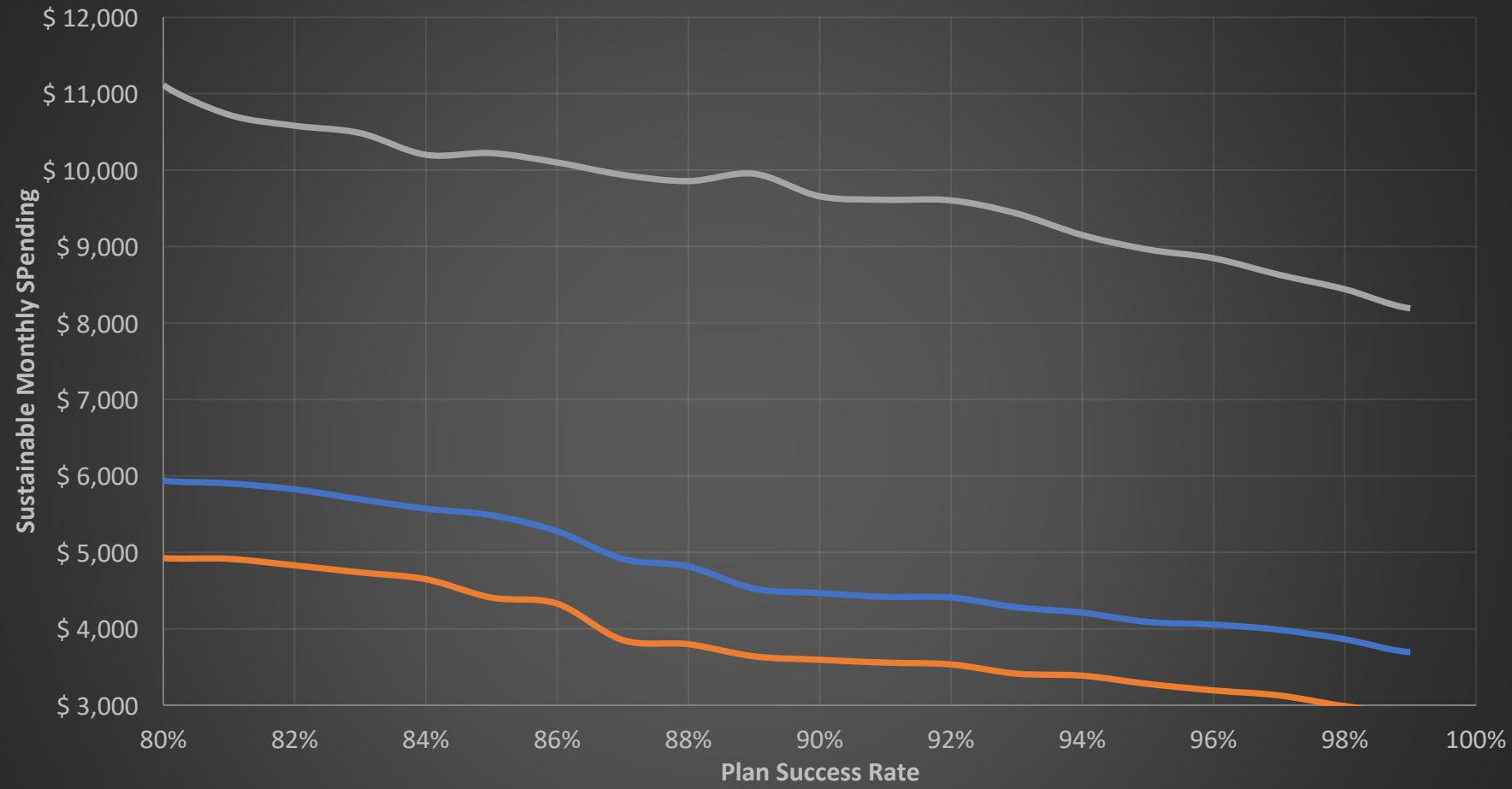


— Systematic Withdrawal — CFR Bucket — Time Bucket — Goal-Based Bucket

Base Strategies

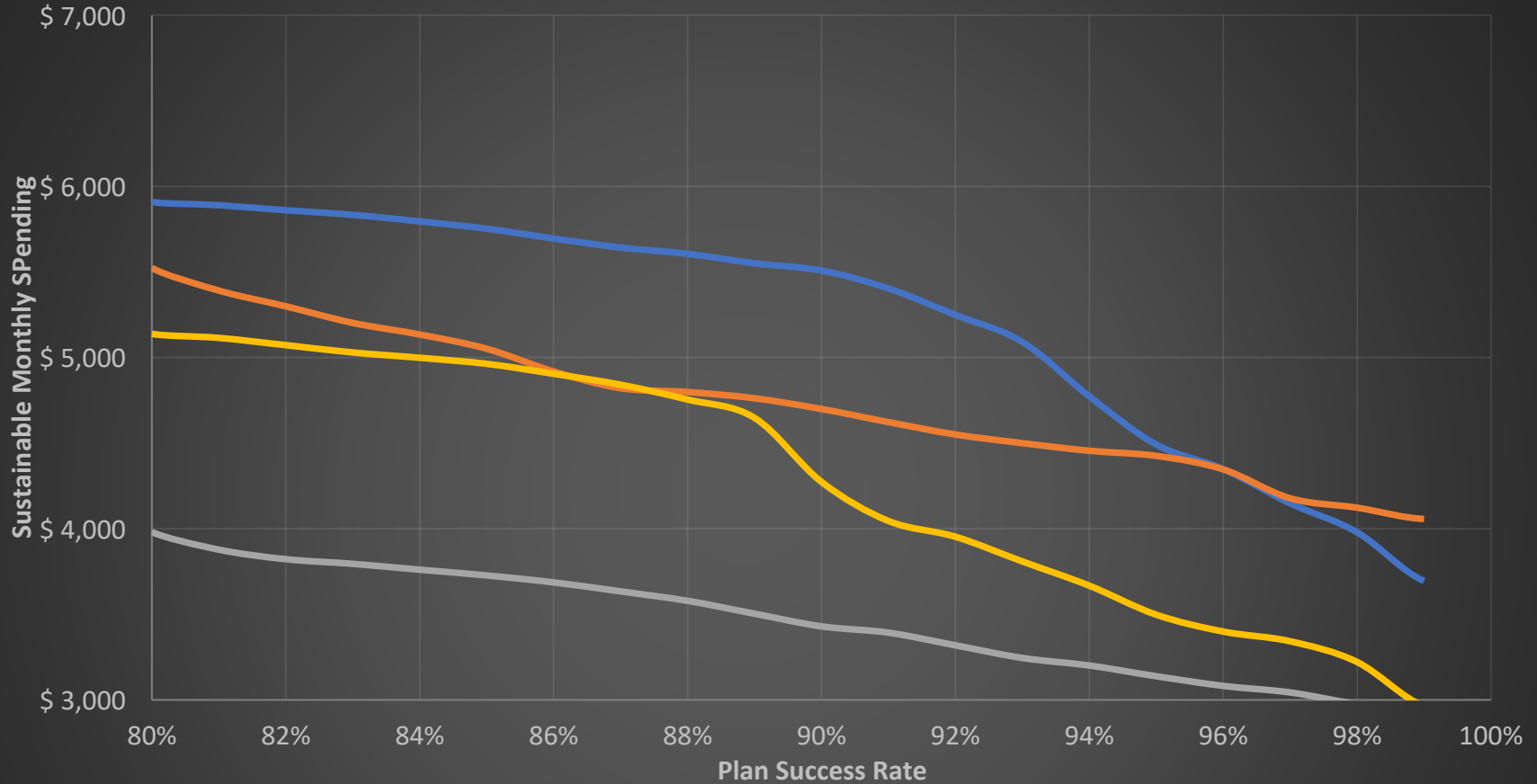
<u>95% Success Rate</u>	Systematic Withdraw	CFR Bucket	Time Bucket	Goal-based Bucket
Sustainable Spending	\$ 4,492	\$ 3,498	\$ 8,948	\$4,576
Percentile				
1%	(316,258)	(123,504)	(12,620)	(312,557)
5%	2,333	2,244	2,477	798
50%	1,084,487	443,187	10,576,637	1,047,172
95%	3,016,646	883,698	33,833,406	2,946,242
99%	4,183,745	1,015,246	49,953,696	4,134,099

Sustainable Monthly Spending by Strategies with Low Starting Return Sequence



— Systematic Withdrawal — CFR Bucket — Time Bucket

Sustainable Monthly Spending When Investor Bails Out from Equity Investment



- Systematic Withdrawal_No Bail out
- Systematic Withdrawal_Bail out @ -20%
- Systematic Withdrawal_Bail out @ -15%

Conclusions

Criteria for comparison	Systematic Withdraw	Cash Reserve Bucket	Time Bucket Strategy	Goal Bucket Strategy
Sustainable spending level	Relative high	Moderate	High	Relative high
Financial plan tail risk	High	Moderate	Low	High
Behavioral benefit	No	High	Moderate*	Moderate
Tolerance of Sequence Risk	Low	Low	Moderate	Low
Tolerance of Transaction Cost	Low	High	Low	Low