

Investment Risk and Return Guide and Reports s1.0

How to use FinaMetrica
to educate clients about risk and return,
and manage their expectations.

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FinaMetrica provides historical performance reports for a representative set of 11 illustrative asset allocations, ranging from very conservative to very aggressive. These user-friendly reports enable advisors to educate clients about risk and return so that clients have realistic expectations and will not be unpleasantly surprised. This guide explains how the reports were generated and how they should be used. The reports themselves can be found here:

Portfolio		Report
1	Very Conservative (1)	http://riskprofiling.com/Downloads/NZSPortfolio_1.pdf
2	Very Conservative (2)	http://riskprofiling.com/Downloads/NZSPortfolio_2.pdf
3	Conservative (1)	http://riskprofiling.com/Downloads/NZSPortfolio_3.pdf
4	Conservative (2)	http://riskprofiling.com/Downloads/NZSPortfolio_4.pdf
5	Balanced (1)	http://riskprofiling.com/Downloads/NZSPortfolio_5.pdf
6	Balanced (2)	http://riskprofiling.com/Downloads/NZSPortfolio_6.pdf
7	Balanced (3)	http://riskprofiling.com/Downloads/NZSPortfolio_7.pdf
8	Growth (1)	http://riskprofiling.com/Downloads/NZSPortfolio_8.pdf
9	Growth (2)	http://riskprofiling.com/Downloads/NZSPortfolio_9.pdf
10	High Growth (1)	http://riskprofiling.com/Downloads/NZSPortfolio_10.pdf
11	High Growth (2)	http://riskprofiling.com/Downloads/NZSPortfolio_11.pdf

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Introduction

One of life’s most unpleasant surprises is to discover you have suffered a significant loss because you underestimated the risks involved. Similarly, it can be almost as disappointing to find you have not made the most of your opportunities because you over-estimated the risks involved.

The FinaMetrica system provides advisers with resources that enable best practice in educating clients about risk and return, and in managing their risk and return expectations. In particular, we provide a unique illustration of downside volatility through analysis of historical falls in portfolio values.

This guide provides detailed analysis of the risk and return characteristics of a representative set of investment portfolios and links the plain-English of the client’s FinaMetrica Risk Tolerance report to these portfolios.

It combines the results of two separate pieces of research:

- ❖ analysis of our database of completed risk tolerance tests (Risk Tolerance Research), and
- ❖ historical back-testing of a representative set of investment portfolios on a month-by-month basis (Portfolio Performance Research).

It is true that the past is no guarantee of the future. But an examination of the past provides clients with a comfortable starting point for understanding the likely pattern of future returns.

Risk Tolerance Research

The Risk Tolerance Research focused on three investment-related aspects of the client’s risk tolerance profile:

1. Preferred Portfolio

Q10 of the risk tolerance questionnaire presents seven portfolios from which to choose. The portfolios are described in terms of a mix of investments, where an investment is classified as low, medium or high risk/return. Cash and Term Deposits are given as examples of low risk/return and Shares and Property are given as examples of high risk/return.

Portfolio	Risk/Return Mix		
	Low	Medium	High
1	100%	0%	0%
2	70%	30%	0%
3	50%	40%	10%
4	30%	40%	30%
5	10%	40%	50%
6	0%	30%	70%
7	0%	0%	100%

Note: During the development of the FinaMetrica system, all questions were tested for Useability, i.e. whether respondents found them easy to understand and answer. Testing showed that questions involving portfolios described in the financial services terminology of asset classes had low Useability. Very few respondents felt that they understood or could answer such questions. However, the Low, Medium and High Risk/Return format of Q10 scored highly for Useability.

2. Return Expectations

Q12 of the risk tolerance questionnaire asks about 10-year return expectations expressed as a multiple of the rate of return from Term Deposits.

Note: Useability testing showed poor results for questions involving rates of return expressed as percentages, whether absolute or inflation-adjusted, over one year or ten. However, respondents were very comfortable answering in terms of comparisons to a familiar benchmark, such as TDs.

3. Sensitivity to Volatility

Q9 of the risk tolerance questionnaire asks about sensitivity to volatility in terms of the level to which the total value of all investments could fall before the person would begin to feel uncomfortable. Figure 1 shows the answers typically given by each of the Risk Groups for these three questions.

	Risk Group				
	Very Low	Low	Average	High	Very High
Preferred Portfolio	2 or 3, more likely 2.	3 or 4, more likely 3.	3 or 4, more likely 4.	4 or 5 equally.	5 or 6, more likely 6.
Return Expectations	1 to 2 times, more likely 1.5.	1.5 to 2.5 times, more likely 2.	2 to >3 times, more likely 2.	2.5 to >3 times.	2.5 to >3 times, more >3.
Sensitivity to Volatility	For most 0% but for some 10%.	For some 10% but for others 20%.	For most 20% but for some 33%.	For some 20% but for most 33%.	For some 33% but for others 50% or more.

Fig 1

These answers are part of the Investment section of the group description found in a client’s Risk Tolerance report. There is a clear progression as risk tolerance increases:

- ❖ Preferred Portfolios become more weighted to high risk/return,
- ❖ Return Expectations increase, and
- ❖ Sensitivity to Volatility decreases.

Portfolio Performance Research

The Portfolio Performance Research involved back-testing the performance of a representative set of eleven illustrative portfolios on a month-by-month basis from January 1, 1973 to December 31, 2016 (the Study Period). The portfolios reflect increasing risk/return from 0% Growth assets to 100% Growth assets in steps of 10%. A mapping of the relevant Risk Groups for each of the eleven portfolios is shown in the asset allocations table below, where by relevant we mean the Risk Groups most likely to have chosen that portfolio.

Portfolio performance was calculated by using asset-class total-return indices as proxies for sector performance. No allowance was made for fees and taxes. Portfolios were rebalanced annually. The objective was to develop a clear understanding of the broad historical risk and return patterns for a representative set of portfolios.

While recognising that the future will not be an unvarying repetition of the past, the patterns evident in the past are the best guide we have to the patterns we will experience in the future. And it is a feel for, and understanding of, patterns and relationships that is the goal.

The asset allocations chosen were:

Portfolio	Relevant Risk Groups	Defensive/Growth Split		Asset Allocations					
		Defensive	Growth	Cash	NZ Fixed Interest	Int. Fixed Interest	NZ Shares	International Shares	
1	Very Conservative (1)	Very Low, Low	100%	0%	20%	40%	40%	0%	0%
2	Very Conservative (2)	Very Low, Low	90%	10%	15%	40%	35%	10%	0%
3	Conservative (1)	Very Low, Low	80%	20%	15%	35%	30%	15%	5%
4	Conservative (2)	Very Low, Low, Average	70%	30%	10%	30%	30%	20%	10%
5	Balanced (1)	Very Low, Low, Average	60%	40%	10%	25%	25%	20%	20%
6	Balanced (2)	Low, Average, High	50%	50%	10%	20%	20%	20%	30%
7	Balanced (3)	Average, High, Very High	40%	60%	5%	20%	15%	25%	35%
8	Growth (1)	Average, High, Very High	30%	70%	5%	15%	10%	30%	40%
9	Growth (2)	High, Very High	20%	80%	5%	10%	5%	30%	50%
10	High Growth (1)	High, Very High	10%	90%	0%	5%	5%	35%	55%
11	High Growth (2)	High, Very High	0%	100%	0%	0%	0%	40%	60%

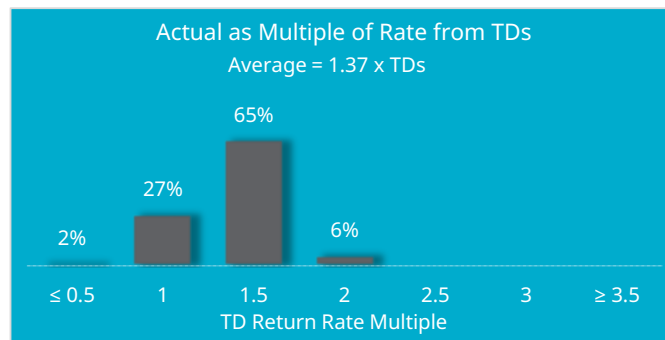
Cash	From Dec 73 to , 90-Day Bank Bill Rate (Reserve Bank of New Zealand) From Jan 73 to Nov 73, CSFB New Zealand 90 Day Bank Bills Gross Returns
NZ Fixed Interest	From Jan 97, Bank of America Merrill Lynch New Zealand Governments 5-10 Years Total Return Index From Jan 73, 10-year Govt Bond Total Return Index (Global Financial Data, Inc.)
International Fixed Interest	From Jan 08, JP Morgan Global Government Bond Index From Dec 77 to Dec 07, Citigroup WGBI All Maturities Index, Currency Hedged to New Zealand dollars From Jan 73 to Nov 77, a constructed proxy for that index
NZ Shares	From Jul 86, NZSX 50 Benchmark Index (Global Financial Data, Inc.) From Jan 73 to Jun 86, NZSX50 Cumulative Index
International Shares	MSCI World Total Return Index (NZD)
Term Deposits	Six Months Deposit Rate (On deposits of \$10,000) (Reserve Bank of New Zealand)
Inflation	New Zealand Consumer Price Index, All Groups

The indices chosen were:

Investor Expectations

10-year Returns

In order to test the actual performance against the return expectations revealed by the Risk Tolerance



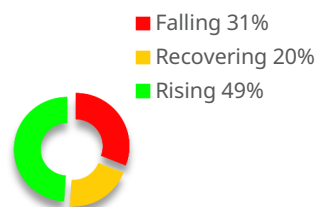
Research, the performance needs to be expressed as a multiple of the rate for TDs.

Fig 2

For example, Fig 2 shows the frequency of occurrence of particular multiples. 64% of the rolling 120-month periods produced a return that was one and a half times the rate earned from TDs over the same period.

Volatility

To test volatility it is not sufficient to consider just fixed time periods, even rolling periods. A fall can start at any time and has no fixed length. Investors experience falls as they happen, not on any fixed schedule. To emulate reality as experienced by investors, the value of the portfolio was tracked month-by-month with each




month being categorized as Falling, Recovering or Rising, which have the meanings shown in Fig 3.

Fig 3

In terms of managing clients' expectations, the historical data can illustrate patterns of rises and falls. In the samples on the next page, there were 71 (71) periods of one month or longer during which the portfolio was rising (falling). These were categorized by Length of Rise/Fall and Depth of Rise/Fall. For example, there were fifteen rises of 10%-19% - one occurred over 3 months, six over 4-6 months and eight over 7-12 months. There were two falls of 10%-19% - one occurred over 3 months and one over 13-24 months.

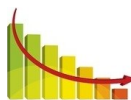
The 'Top Ten' Rises and Falls by Depth were also identified in each portfolio, along with the month in which the Rise/Fall began, the duration of the Rise/Fall, the month in which the Rise ended, and for Falls the duration of



Length (mths)	Percentage Rise					Total
	< 10%	10%-19%	20 -33%	33 -50%	>50%	
1	20					20
2	15					15
3	9	1				10
4-6	8	6				14
7-12	1	8	1	1		11
13-24					1	1
>24						
Total	53	15	1	1	1	71

Height of Rise	Started Rising	Months in Rise	End of Rise
50.8%	Jun-82	15	Sep-83
45.5%	Jan-86	10	Nov-86
24.7%	Mar-80	8	Nov-80
19.5%	Oct-84	9	Jul-85
17.0%	Jan-93	7	Aug-93
16.3%	Aug-85	4	Dec-85
14.1%	Nov-97	8	Jul-98
14.0%	Mar-89	6	Sep-89
13.3%	Mar-97	4	Jul-97
12.1%	Dec-86	8	Aug-87

the Recovery and the month in which Recovery occurred.



Length (mths)	Depth of Fall					Total
	< 10%	10%-19%	20 -33%	33 -50%	>50%	
1	47					47
2	14					14
3	2	1				3
4-6	3					3
7-12	2					2
13-24	1	1				2
>24						
Total	69	2				71

Depth of Fall	Started Falling	Months in Fall	Months to Recover	Recovery
-15.5%	Jan-73	20	7	Apr-75
-11.7%	Aug-87	3	9	Aug-88
-9.9%	Apr-01	22	9	Nov-03
-9.8%	Jul-90	2	4	Jan-91
-9.1%	Jan-94	11	6	Jun-95
-8.6%	Jan-09	2	17	Aug-10
-6.7%	Oct-07	4	10	Dec-08
-5.8%	Feb-11	6	6	Feb-12
-5.7%	Sep-89	7	2	Jun-90
-5.7%	Jul-98	1	2	Oct-98

Fig 4 (Rises)

Fig 5 (Falls)

Historical Returns

For each portfolio, the nominal and real historical returns for 1 to 10 years were calculated for the Study Period and for the most recent 10 years.

The terms Best/Highest, Average and Worst/Lowest mean just that for the period in question. However, the Best/Highest result and the Worst/Lowest result represent extreme outcomes which have occurred only once in that period. A more informative picture of the likely range of results can be obtained by excluding the best/highest and worst/lowest 5%. The term High/Good means a result that was higher than 95% of the results and, similarly, the term Low/Poor means a result that was higher than only 5% of the results.

While rates of return are relevant, the money value of the investment at the end of the period is what can be spent. This end value represents the accumulated account value and reflects the compounding effect of annual returns over time. The real end values for a \$1000 lump sum and a saving plan of \$100 every month invested over 1 to 10 years were also calculated for the Study Period and the most recent 10 years.

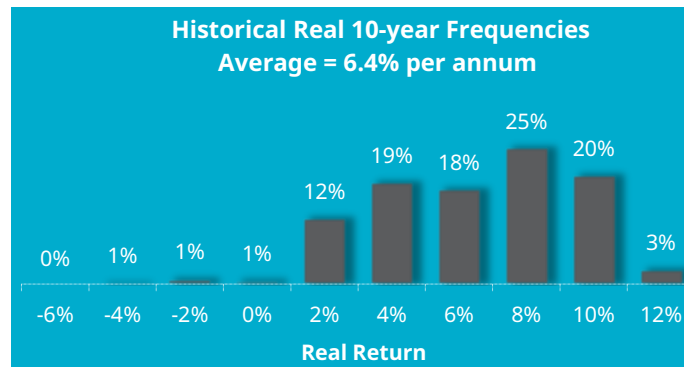
For example, Fig 6 shows the real end values of \$100 invested every month for 1 to 10 years over the Study Period. For a five-year savings plan the total amount invested would have been a real \$6,000 (60 months at a real \$100 per month.) As can be seen, the Historical Average result was accumulated savings of \$7,045. A Good result was \$8,569 and a Poor result was \$5,529, which was actually a loss on the \$6,000 invested.

Historical Real End Values for Savings of \$100 Real Per Month

	1 yr	2 yrs	3 yrs	5 yrs	10 yrs
Best	\$1,516	\$3,256	\$5,160	\$10,340	\$23,934
Good	\$1,356	\$2,915	\$4,669	\$8,569	\$21,632
Average	\$1,236	\$2,549	\$3,947	\$7,045	\$17,239
Poor	\$1,123	\$2,251	\$3,382	\$5,529	\$13,290
Worst	\$1,034	\$1,971	\$3,167	\$5,019	\$11,741

Fig 6

A more detailed picture of the return variability can be obtained by looking at the frequency of specific rates of return. For example, Fig 3 shows the frequencies of specific annualised rates of return over 10 year periods over the Study Period. As can be seen, the return was about 8% per annum in 25% of the periods, and about



10% per annum in 20% of the periods.

Fig 7

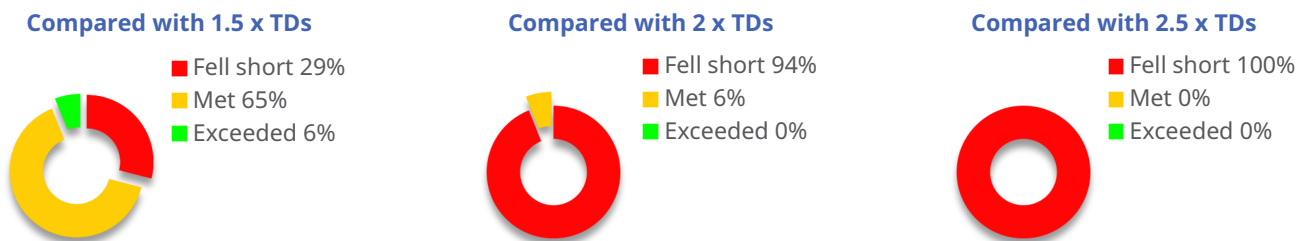
Working with Clients

Let's begin with an example. Suppose we take a Average Risk Group client whose answers to the investment questions were typical of their group, i.e. there were no differences reported in the risk tolerance test report. Our client:

- ❖ will have a risk tolerance score between 45 and 54,
- ❖ will have chosen Portfolio 3 or 4 as their Preferred Portfolio, and,
- ❖ for most, the downside 'comfort' zone will be minus 20% but for some minus 33%.

Return Expectations

If our client had invested in Balanced (2) over the Study Period and assuming that Fig 2 shows the pattern of returns for Balanced (2), these can be categorized in terms of meeting our client's return expectations as



shown in Fig 8.

Fig 8

If our client had expected 10-year return of two times TDs, our client would have been satisfied with their returns only 6% of the time and dissatisfied majority of the time (94%).

Sensitivity to Volatility

If our client selected a downside comfort zone of 20% and again assuming that Fig 5 shows Balanced (2)'s falls pattern, our client would have never been taken outside their minus 20% downside 'comfort' zone.

All in all, our client's expectations appear reasonable from a historical perspective. If anything, return expectations appear marginally optimistic and volatility expectations appear marginally pessimistic.

But let us suppose that our client's downside 'comfort' zone was minus 10% (which would have been reported as a difference in their Risk Tolerance report.) Then there would have been two falls, starting January 1973 (-15.5%) and August 1987 (-11.7%), which would have caused 'discomfort'. Whether the possibility of experiencing such falls would cause our client to choose a portfolio with lower risk/return is a matter for discussion between adviser and client.

Alternatively, let us suppose that our client's return expectations were for two and a half times the rate from TDs (which, again, would have been reported as a difference in their Risk Tolerance report.) Education about risk and return is clearly called for here. Even the most growth-oriented portfolio, High Growth (2) would only rarely have achieved this level of return.

More generally, the Risk and Return Reports provide a detailed summary of expectations and actual historical performance for each of the eleven representative portfolios. They can be used in conjunction with any client's Risk Tolerance report to make the same expectations-versus-historical-performance comparisons as have been made above for our sample client.

As can be seen from the Risk and Return Reports, there is a clear progression in expectations as risk tolerance increases. Typically,

- ❖ Clients in the Very Low Risk Group have quite realistic expectations with regard to returns but their desire for no falls is simply not achievable. However, if they do not check the value of their portfolio too regularly they may never be 'discomforted' as the falls are both small and short-lived.
- ❖ Clients in the Low and Average Risk Groups have quite realistic expectations with regard to volatility. But, by way of contrast, their return expectations are overly optimistic.
- ❖ Clients in the High and Very High Risk Groups have very optimistic return expectations, wildly so in the case of the Very High Risk Group. On the other hand, their ability to weather downturns is high.

Where, an adviser is intending to recommend an asset allocation different to that of any of the eleven representative portfolios, a guide to its historical performance can be obtained by considering the closest representative portfolio(s).

Conclusion

This guide and the accompanying reports enable FinaMetrica users to build on their clients' risk profiling experience by educating them about risk and return so as to manage their expectations and explain the risks of the investment strategy being recommended ... and it does so with simple illustrations and in the plain-English framework of the FinaMetrica Risk Tolerance Profile questionnaire and report. The reports are available from the links provided on page 1.



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