

## Standard Risk Measures

September 2021

This paper provides the Standard Risk Measure for Schroder Investment Management Australia Limited's ("Schroders") key funds. The Standard Risk Measure is based on industry guidance to allow members to compare investment options that are expected to deliver a similar number of negative annual returns over any 20 year period. The Standard Risk Measure is not a complete assessment of all forms of investment risk, for instance it does not detail what the size of a negative return could be or the potential for a positive return to be less than a member may require to meet their objectives. Further, it does not take into account the impact of administration fees and tax on the likelihood of a negative return. Members should still ensure they are comfortable with the risks and potential losses associated with their chosen investment.

The Standard Risk Measures below are based on return distributions from a forward looking methodology, whereby market returns were decomposed into their underlying elements and the fundamental drivers of these factors were forecast. Non-normal risk metrics were used to capture the "fat tail" nature of financial markets and to provide a more accurate measure of the risk being undertaken.

The fund distributions were calculated net of investment fees, with the fee from the highest fund class used, and gross of tax – the impact of franking credits was ignored. To be conservative, alpha on each of the funds was assumed to be zero. Using the estimated return distributions the probability of a negative return over one year was calculated. This was then multiplied by 20 to provide the estimated number of negative years in 20. This estimate was used in combination with the Joint ASFA/FSC Working Group risk labels and risk bands to provide the classification for each fund.

**Figure 1: Standard Risk Measures**

Fund	Est. no. of negative years out of 20	Risk label	Risk band
Schroder Australian Equity Fund	4.9	High	6
Schroder Wholesale Australian Equity Fund	4.9	High	6
Schroder Equity Opportunities Fund	4.9	High	6
Schroder Australian Equity Long Short Fund	5.3	High	6
Schroder Global Emerging Markets Fund	5.7	High	6
Schroder Sustainable Global Core Fund	5.1	High	6
Schroder Global Value Fund	5.1	High	6
Schroder Global Value Fund (Hedged)	4.9	High	6
Schroder Global Sustainable Equity Fund	5.1	High	6
Schroder Global Sustainable Equity Fund (Hedged)	4.9	High	6
Schroder Global Sustainable Fund	4.9	High	6
Schroder Emerging Markets Sustainable Fund	5.7	High	6
Schroder Asia Pacific Fund	6.3	Very High	7
Schroder All China Equity Opportunities Fund	6.8	Very High	7
Schroder Global Recovery Fund	5.3	High	6
Schroder Specialist Private Equity Fund		High	6

Fund	Est. no. of negative years out of 20	Risk label	Risk band
Schroder Real Return Fund	3.3	Medium to High	5
Schroder Real Return Fund (ASX: GROW)	3.3	Medium to High	5
Schroder Multi-Asset Income Fund	3.0	Medium	4
Schroder Strategic Growth Fund	4.3	High	6
Schroder Enhanced Cash Management Fund	0.0	Very Low	1
Schroder Australian Investment Grade Credit Fund	0.9	Low	2
Schroder Higher Yielding Credit Pool	4.1	High	6
Schroder Abs. Return Income (CXA: PAYS)	1.8	Low to Medium	3
Schroder Abs. Return Income Fund	1.8	Low to Medium	3
Schroder Fixed Income Fund	3.8	Medium to High	5
Schroder Global Corporate Bond Fund	3.7	Medium to High	5
Schroder Global High Yield Bond Fund	4.3	High	6
Schroder Global Bond Fund	3.6	Medium to High	5

### Strategic forecasts

To generate strategic forecasts, market returns are decomposed into three elements: income; growth in income; and the effect of changing valuations. These can be combined to produce the following formula:

$$R = Y + G + V$$

Where:

Y is the current investment yield, a known quantity.

G is the annualised growth in income or earnings for the asset.

V is the valuation effect.

The first two components, Y + G, are a reduced form of the Gordon growth model, and while it does not take into account reinvestment returns, unlike the Gordon model, these are small and can therefore be ignored. The Gordon model doesn't take into account valuation impacts as it is used for forecasting very long term returns, where valuation impacts are small. However, valuation impacts become more important as the time horizon becomes shorter and is required when forecasting shorter horizons. Strategic forecasts are calculated for a 10 year horizon, which is short enough to remove the cyclicity of market returns, while not too long to be impacted by multiple secular trends. To extend the horizon to 20 years, it is assumed that the second ten years' performance is equal to the historical long run trend.

**Figure 2: Return Forecasts**

Asset Class	Yield (%)	Income Growth (%)	Valuation Effect (%)	Hedge (%)	10yr Forecast (%)	Long Run Average (%)
<b>Growth Assets</b>						
Australian Equities	2.8	3.5	-1.1		5.2	11.0
Global Equities (Hedged)	3.2	2.4	-2.1	0.6	4.1	10.5
Global Equities	3.2	2.4	-2.1		3.6	9.5
Emerging Market Equities	1.4	5.7	-0.7		6.4	9.5
Asia ex Japan Equities	1.3	5.2	-0.5		6.0	9.0
Chinese Equities	1.6	6.5	-0.5		7.6	9.5
<b>Diversifying Assets</b>						
High Yield Bonds	3.9		-1.0	0.2	3.2	9.5
High Yield Floating	2.8		-0.3		2.5	7.0
Objective Based	7.5				6.5	6.5
<b>Defensive Assets</b>						
Australian Bonds	1.2				1.2	6.0
Australian Corporate Bonds	2.1				2.1	6.5
Global Bonds	0.5			0.9	1.5	7.0
Global Corporate Bonds	1.4			0.6	2.0	7.5
Cash					1.0	5.0

Figure 2 tables the current 10 year forecasts for the various asset classes (with objective based being the Schroder Real Return CPI Plus 5% Fund), the underlying assumptions, and the long run historical average return.

For equities, income is the current dividend yield plus an adjustment for estimated net stock buybacks; growth of income is EPS growth plus an adjustment for estimated long run impacts from climate change, with forecasts based on nominal GDP growth per capita; and the valuation effect which is based on the expected change in the P/E ratio. Academic research has found a link between earning per share growth and GDP per capita, with papers finding a strong relationship between growth in earning per share and GDP per capita. This is also intuitively appealing as it ties earnings per share growth to productivity. Given population projections are readily available, and if dilution is the true factor, the evidence suggests that population growth is a useful proxy, GDP per capita forecasts can be used to forecast earnings growth. GDP per capita forecasts are based on a three Ps approach (population, participation and productivity) made popular via the Treasury's work in the Intergenerational Reports. The forecasts have also been cross checked with estimates from the Schrodgers Economics Group, as well as Oxford Economics and the IMF. The climate change adjustment incorporates four different factors: physical costs, transition costs, stranded assets and change in inflation, based on work from the Schrodgers Economics Group and Cambridge Econometrics.

The forecast of the terminal PE ratio is determined by using assumptions about the inflation environment, the perceived growth potential of the market, and taking into account the tendency of PE to revert to the mean.

For bonds, 10 year return forecasts are based on the current long maturity bond yield, with income growth zero by definition and the valuation effect assumed to be zero. For credit securities, the current yield is adjusted to take into account losses from default.

With cash securities having short term maturities, they do not fit easily into the above framework. Cash return forecasts are based on the inflation outlook and historical inflation risk premium adjusted for an inflation stability factor and demographic trends.

For risk modelling, further moments for each asset class distribution and the correlations are required, especially as we aim to capture the non-normal nature of asset class returns by reflecting the leptokurtosis (fat tails) and skewness that is inherent in financial markets. Risk measures tends to experience long term regimes with both volatility and correlations relatively constant within the regimes but very different from one regime to another. The correlation between equities and bonds is very good at demonstrating this: correlations between equity and bond returns were positive in the 70s and have been negative in more recent decades. Our contention is that inflation regimes are the key driver of the risk regimes as it impacts on the relative and absolute variability of the real and nominal asset class returns. The risk and correlation measures are based on the outcomes of similar inflation regimes, to the one expected to prevail, adjusted for any structural change in the asset class. The asset class distribution moments presented in figure 3.

**Figure 3: Asset Class Distributions**

Asset Class	Long run Return (%)	Standard Deviation (%)	Skew	Kurtosis
<b>Growth Assets</b>				
Australian Equities	8.1	13.0	-0.4	2.0
Global Equities (Hedged)	7.3	14.0	-1.5	4.3
Global Equities	6.5	13.0	-0.4	1.4
Emerging Market Equities	7.9	17.5	-0.8	0.6
Asia ex Japan Equities	7.5	17.0	-0.6	0.7
Chinese Equities	8.6	23.0	-0.4	0.9
<b>Diversifying Assets</b>				
High Yield Bonds	6.3	10.0	-0.6	3.3
High Yield Floating	4.8	7.0	-0.5	5.8
Objective Based	6.5	6.5	-1.0	4.5
<b>Defensive Assets</b>				
Australian Bonds	3.6	3.5	-0.1	0.6
Australian Corporate Bonds	4.3	2.5	-0.1	0.7
Global Bonds	4.2	6.0	0.0	0.6
Global Corporate Bonds	4.8	7.0	-0.6	2.5
Cash	3.0	0.5	0.0	2.0

### Standard risk measure modelling

To convert the distribution moments and correlation data into probability of loss forecasts we utilised our proprietary portfolio optimisation and analytics tool (SPARTA+) to run Monte Carlo simulations and provide more detailed information about the distributions for the asset classes and Schroders' fund range. Figure 4 shows an example of the output for the Australian Equity asset class.

**Figure 4: Australian Equity Asset Class Distribution**

S&P ASX 200 Accumulation Index



Source: SPARTA+

To take the asset class information and apply it across the Schroders’ fund range, two key assumptions were made. First, given most of our funds have several fund classes which have different investment management fees, the fee from the fund class with the highest investment management fee was taken. Second, while we have a strong history of achieving alpha across our funds, alpha is assumed to be zero. Both of these assumptions were chosen as they were the most conservative. Also, as per the guidelines, diversified funds’ asset allocation is based on the current strategic asset allocation.

Figure 5 provides a summary of the risk measures for Schroders’ funds. Using the estimated return distributions based on the data above, the probability of a negative return over one year was calculated. This was then multiplied by 20 to provide the estimated number of negative years in 20. This estimate was used in combination with the Joint ASFA/FSC Working Group risk labels and risk bands to provide the classification for each fund.

**Figure 5: Schroders’ Funds Risk Profiles**

Fund	Forecast Net Return (%)	Probability of Loss (%)	Est. no. of negative years out of 20	Risk label	Risk band
Schroder Australian Equity Fund	7.5	24.5	4.9	High	6
Schroder Equity Opportunities Fund	7.5	24.5	4.9	High	6
Schroder Australian Equity Long Short Fund	7.0	26.5	5.3	High	6
Schroder Global Emerging Markets Fund	7.0	28.5	5.7	High	6
Schroder Sustainable Global Core Fund	6.0	25.4	5.1	High	6

Fund	Forecast Net Return (%)	Probability of Loss (%)	Est. no. of negative years out of 20	Risk label	Risk band
Schroder Global Value Fund	6.0	25.4	5.1	High	6
Schroder Global Value Fund (Hedged)	6.5	24.5	4.9	High	6
Schroder Global Sustainable Equity Fund	6.0	25.4	5.1	High	6
Schroder Global Sustainable Equity Fund (Hedged)	6.5	24.5	4.9	High	6
Schroder Global Sustainable Fund	6.5	24.7	4.9	High	6
Schroder Emerging Markets Sustainable Fund	7.0	28.5	5.7	High	6
Schroder Asia Pacific Fund	6.5	31.6	6.3	Very High	7
Schroder All China Equity Opportunities Fund	7.5	33.9	6.8	Very High	7
Schroder Global Recovery Fund	5.5	26.4	5.3	High	6
Schroder Specialist Private Equity Fund*	10.0			High	6
Schroder Real Return Fund	5.5	16.5	3.3	Medium to High	5
Schroder Real Return Fund (ASX: GROW)	5.5	16.5	3.3	Medium to High	5
Schroder Multi-Asset Income Fund	4.5	14.8	3.0	Medium	4
Schroder Strategic Growth Fund	5.8	21.7	4.3	High	6
Schroder Enhanced Cash Management Fund	3.0	0.0	0.0	Very Low	1
Schroder Australian Investment Grade Credit Fund	4.3	4.6	0.9	Low	2
Schroder Higher Yielding Credit Pool	4.8	20.5	4.1	High	6
Schroder Abs. Return Income (CXA: PAYS)	3.9	9.0	1.8	Low to Medium	3
Schroder Abs. Return Income Fund	3.9	9.0	1.8	Low to Medium	3
Schroder Fixed Income Fund	3.0	18.8	3.8	Medium to High	5
Schroder Global Corporate Bond Fund	5.0	18.3	3.7	Medium to High	5
Schroder Global High Yield Bond Fund	6.5	21.7	4.3	High	6
Schroder Global Bond Fund	4.0	18.0	3.6	Medium to High	5

\*Output for the Schroder Specialist Private Equity Fund is determined based on expected return and risk inputs from the Private Equity team

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