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Equity

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Global Quality Income Index

The Methodology

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Methodology in brief

1. Universe

The universe of eligible stocks (or "**Universe**") is defined as the universe of stocks that i) are currently listed on a regulated market of an "**Eligible Country**" (as defined hereinafter), ii) are not financial companies, and (iii) have a free float adjusted market capitalisation of at least US$ 3bn (adjusted for the performance of global equity markets starting from 31/12/2011). Only stocks which belong to the Universe will be considered for the SG Global Quality Income Index (hereafter called the "**Index**"). In cases when multiple lines of the same company qualify for the Universe, only the largest by free float market capitalization is considered.

"**Eligible Country**" means a country which belongs to the following list: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, South Korea, Switzerland, United Kingdom, United States. This may be updated from time to time by Societe Generale acting as Index Sponsor.

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2. Summary of criteria for initial selection

The SG Global Quality Income Index includes stocks within the Universe which combine all three criteria below:

i) A quality score, as defined later, of 7 or better.

ii) A balance sheet risk score, measured by calculating a distance to default measure, as defined later, that ranks within the top 40% of the Universe, as determined by the Index Sponsor.

iii) An adjusted dividend yield, as defined later, greater than highest value of either 4% or 125% of the market cap-weighted dividend yield of the Universe, as determined by the Index Sponsor.

3. Periodic review schedule

We will rebalance the portfolio quarterly on the 7th Business Day in January, April, July and October (each of such days being defined as the "**Quarterly Rebalancing Date**"). All stocks within the Index are equal-weighted. The quantities of each stock within the Index will be determined using the last available prices of each stock as at the end of the third Business Day preceding such Quarterly Rebalancing Date and communicated by the Index Calculation Agent by the end of the second Business Day preceding such Quarterly Rebalancing Date. The Quarterly Rebalancing Date may be delayed by the Index Sponsor or, as the case may be, the Index Calculation Agent, in case any of the stocks of the Index (outgoing or incoming) is not tradable.

4. Selection of stocks at quarterly review

The Index Sponsor uses a variety of buffer rules to limit the turnover of the strategy and provide stability to the selection of stocks. A security will be included in the Index at the periodic review if it fulfils all four conditions set above for the initial construction of the Index. An existing constituent will remain in the Index if at the time of the periodic review:

i) It is listed on a regulated market of an Eligible Country and it is not a financial company

ii) It maintains a free float adjusted market capitalisation of at least US$2bn (adjusted for the performance of global equity markets starting from 31/12/2011).
iii) It maintains a quality score of 5 or better.
iv) It maintains a balance sheet score that ranks within the top 60% of the Universe.
v) It maintains an adjusted dividend yield, as defined later, greater than highest value of either 3.5% or 110% of the market cap-weighted dividend yield of the Universe, as determined by the Index Sponsor.

Securities that fail to satisfy any of the above conditions will be removed from the Index subject to maintaining a minimum of 25 stocks in the Index.

5. Restricting the Index size

To limit turnover we restrict the Index size to between 25 and 75 stocks. Whilst most of the time the available stocks which pass the Index eligibility criteria fall within this band, on occasion there may be too few or too many stocks. This will necessitate relaxing or restricting the criteria to ensure the number of stocks in the index stays within these allotted bands.

If there are less than 25 stocks that meet the criteria, the Index Sponsor will:

a) Add all companies that pass original eligibility criteria into the index.
b) For all remaining companies, lower the entry market cap and yield threshold to US$2bn (adjusted for the performance of global equity markets starting from 31/12/2011) and 3.5% respectively.
c) Rank all companies that satisfy the above constraints based on the "**Overall Quality Score**", which is defined as the sum of (i) the quality score and (ii) two times the balance sheet score quintile ranking (5 being the highest rank).
d) Add companies with the highest Overall Quality Score until the index gets to 25 stocks. For companies with identical Overall Quality Score the Index Sponsor will give preference to the stocks with the higher yield.
e) In the event that after this process there are still less than 25 names that qualify for the index, the Index Sponsor will further reduce the market cap and yield entry requirements by 10% and repeat process described in d) and e).

If there are more than 75 stocks that qualify for the index, the Index Sponsor will:

a) Add all current constituents that are still eligible.
b) Rank all newly eligible stocks based on the Overall Quality Score.

Add companies with the highest Overall Quality Score until the index gets to 75 stocks. For companies with identical Overall Quality Score the Index Sponsor will give preference to the stocks with the higher yield.

6. Major event change

In the event of significant and unpredictable events, including but not limited to acts of God, natural disaster, epidemic, weather, accident, industrial action, Government action, civil unrest, war, threat of war, or major accounting fraud, the Index Sponsor may elect to remove stocks from the Index as a consequence. These will be out of the ordinary events and not those typically associated with the economic cycle. In such events, the number of Index may exceptionally decrease below 25 until the following Quarterly Rebalancing Date.

7. Methodology review

The Index is maintained with the objective of taking into account the evolution of the Universe on a continuous basis. In particular, the Index is maintained in order to preserve is continuity, its investability and its stability. For this purpose, the Index Sponsor may need to update the Index methodology from time to time and publicise the corresponding changes.

Overview

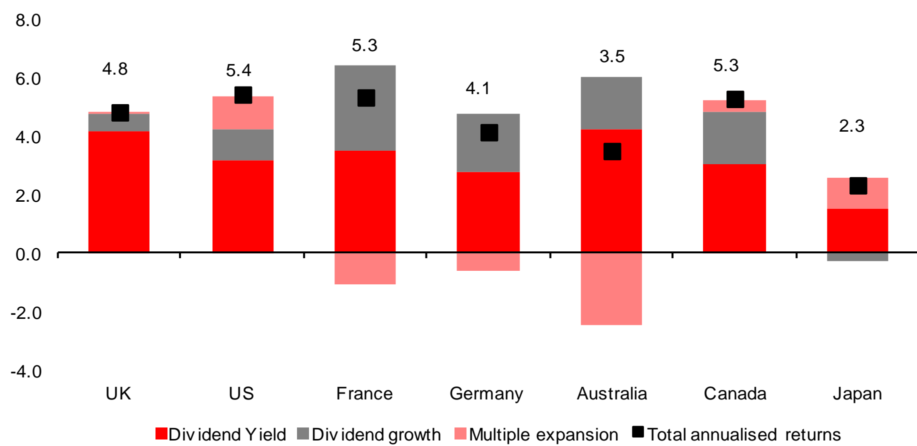
Equity returns are driven by dividend yield

Compounding higher dividend yield over longer periods makes beating the benchmark increasingly likely.

The global quality income strategy is based on two basic principles. The first is that historically dividend yield represents the biggest component of equity returns, and the second is that equity investors are not rewarded for buying higher risk stocks.

As shown below, the decomposition of real equity returns shows that dividend yield has dominated historical returns. Valuation change is, by its very nature, limited. Valuation multiples cannot expand indefinitely, but clearly equity market bubbles do emerge. Rather, expensive multiples have a greater tendency to mean-revert.

Decomposition of real historical equity returns since 1970



Source: SG Cross Asset Research, MSCI

We know that locking in an above average yield over the long term should lead to outperformance, which certainly has been the case historically. Once you compound that higher dividend yield over extended periods, beating the benchmark becomes increasingly likely. As such the strategy is trying to buy stocks with a higher level of dividend yield whilst minimising the likelihood of dividend cuts and balance sheet problems.

The first part of the process is to identify a universe of lower risk, higher quality assets. The Index Sponsor has identified a set of measures that not only reduces the overall volatility, beta and drawdown of the portfolio, but which also over time delivers outperformance and reduces the probability of dividend cuts. Importantly none of our quality measures incorporate any forecasts – they are solely based on reported information. Also the Index avoids drawdown and balance sheet risk, and because it is difficult to sufficiently assess financial sector balance sheet risks, our Index excludes financials.

Universe & Benchmark description

The starting Universe consists of stocks that: i) are currently listed on a regulated market of an 'Eligible Country' (as defined hereinafter), ii) are not financial companies, and (iii) have a free float-adjusted market capitalisation of at least US$ 3bn.

'Eligible Country' means a country which belongs to the following list: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, South Korea, Switzerland, the United Kingdom, and the United States. This may be updated from time to time by Societe Generale in its role as Index Sponsor.

Quality Factors

The next step is to remove those stocks that do not meet the quality criteria of the Index. Using the annual report and accounts available, the Index Sponsor will be looking for stocks to score seven or more on the following criteria.

	Criterion	Group
i)	ROA positive	Profitability factors
ii)	CFO positive	
iii)	△ROA positive	
iv)	Accruals negative	
v)	△Leverage negative	Leverage, liquidity and source of funds
vi)	△Liquid positive	
vii)	△Finance negative	
viii)	△Margin positive	Operating efficiency
ix)	△Turnover positive	

Profitability

The model uses three profitability measures; i) ROA, ii) CFO and iii) △ROA. ROA is calculated as net income before extraordinary items divided by total assets whilst CFO is cashflow from operations divided by total assets. If ROA is positive, the firm is profitable, so the firm scores 1, otherwise it gets 0. The same notion applies to CFO. Improving profitability is also desirable, so △ROA is simply the year-on-year change in ROA where, if last reported year ROA is greater than in the previous year, the firm is awarded a score of 1.

Generating profit growth by actually selling more stuff, rather than having the accountants work overtime is also preferable and numerous papers, most notably Sloan[1], have long advocated using accruals in the investment process. The model compares net income before extraordinary items against cashflow from operations. So, our iv) is that if the change in CFO is greater than the change in ROA then the firm's scores 1, otherwise it gets 0.

[1] Sloan, R.G. *Do Stock Prices Fully Reflect Information in Accruals and Cash Flows about Future Earnings?* The Accounting Review 71 (July1996): 289-316.

Leverage, liquidity and source of funds

Avoiding balance sheet weakness is clearly very important. Three factors help avoid stocks running into financial difficulty. The first, v) △Lever is the annual change in a company's leverage as measured by the year-on-year change in the ratio of long-term debt to total assets. The ability to self-finance a business is obviously important, and more often than not totally forgotten at the peak of the economic cycle.

Our vi) △Liquid concerns the short-term financing of the business and is measured as the annual change in the current ratio (the ratio of current assets to current liabilities). A rise in the current ratio indicates the ability to service debt costs, whilst a decline could indicate potential short-term funding problems.

Issuing stock ultimately costs the existing shareholder, either in cash or dilution. A deeply discounted rights issue at depressed prices is particularly irritating. In this model, those stocks which issue equity, which is measured as the year-on-year change in shares (vii △Finance) scores 0 and those that don't score a 1.

Operating efficiency

The model includes two simple measures of the firm's operating performance – an increase in operating margin viii) △Margin (measured as the year-on-year change in the gross operating margin), and the annual change in the asset turnover. The latter, ix) △Turnover, shows how much sales have increased relative to the size of the asset base. Increasing sales at a greater speed to the change in assets implies that a firm is generating more business from existing assets rather than simply making acquisitions.

Market barometer of current balance sheet risk

Economic and market conditions, as well as stock-specific events can render report and account data obsolete. As such the Index uses a more contemporaneous, market-based measure of balance sheet risk. For this, the Index Sponsor uses a distance to default model that looks at the equity of the firm as a contingent claim on the firm's capital structure. It assumes that the corporation is financed through a single debt instrument (zero-coupon bond) and a single equity issue (not paying dividends). At the maturity of the bond, the firm liquidates its assets and ceases to exist. Bondholders receive back the face value of the bond while shareholders receive any residual payment (assets minus face value of bond). In the case where the firm is not capable of paying off its creditors (default), the bondholders will claim the whole asset value of the firm and the shareholders will receive nothing.

Distance to default (DD)

The Distance to Default (DD) is a widely used indicator of the credit quality of a company. It measures the number of standard deviations between the asset's value and the default point.

Distance to default measure

$$\text{Distance to Default} = \frac{\text{Assets Value - Default Point}}{\text{Assets Value} \times \text{Asset Volatility}}$$

or

$$\text{Distance to Default} = \frac{\ln(A/F) + (r - \sigma_A^2/2) \times T}{\sigma_A \times \sqrt{T}}$$

Implementation

In order to estimate the distance to default for a company the Index Sponsor first estimates the value of the distance to default inputs:-

Default point (F)

KMV[(2)] has conducted extensive empirical research and found that the book value of current liabilities plus half the long term liabilities provide a sensible estimate of the default point[3]. (The default point is measured in standard deviations of the price move.)

Interest rate (r)

The Index uses the local six month interbank rate, or if that is not available the most relevant alternative.

Time to maturity (T)

In real life the capital structure of a firm is obviously much more complicated than the one assumed by Merton. In a company's balance sheet you can find various liabilities with different maturities. Later Merton-based models take into account this fact but our goal is not to calculate precisely the distance to default of a company, but to get a reliable ranking of the company's credit quality and balance sheet strength. Therefore, the Index Sponsor simplifies by assuming a time to maturity of one year for all the companies in our sample. A higher or lower maturity would alter the estimated distance to default significantly but would not affect the ranking.

Market value of assets (A) and asset volatility (σ_A)

Neither of these inputs are directly observable, but they can be implied starting from the market value of the equity (E) and equity volatility (σ_E) and by using the Black-Scholes formula. Estimating the equity value and volatility is clearly not a problem. The Index uses the six month historical volatility and the full market value of the company.

Market value of assets and asset volatility

A and σ_A can be estimated by solving the below system of equations

$$E = A \times N(d_1) - e^{-rT} \times F \times N(d_2)$$

$$\sigma_E = \frac{A}{E} \times N(d_1) \times \sigma_A$$

$$\text{N(.)}: \text{Cumulative Standard Normal Distribution}$$

$$d_1 = \frac{\ln(A/F) + (r + \sigma_A^2/2) \times T}{\sigma_A \times \sqrt{T}}, d_2 = d_1 - \sigma_A \times \sqrt{T}$$

By ranking our non-financial universe into quintiles, not only do returns improve but most importantly volatility, beta and maximum drawdown are reduced. The SG Global Quality Income Index selects stocks only from the top two quintiles based on this measure.

Seeking the best dividend yield

The SG Global Quality Income Index sets out a minimum dividend yield of 4%, or 125% of the Universe, whichever is highest, with the caveat that the portfolio should have a minimum of 25

2 Moody's KMV is a leading quant credit analysis provider.

3 "Default Point Estimation" (Demircubuk and TSE, 2001)

stocks at any one point in time. Where available the Index Sponsor uses the one year forward dividend yield based on IBES consensus forecasts. Where it is unavailable the Index Sponsor uses the reported dividend from the report and accounts sourced from Factset fundamentals.

NOTE that the Index Sponsor will cross-check these dividend assumptions with the SG quant dividend database. Consensus dividends often contain special dividends, scrip dividends and a mixture of currencies. Where appropriate it will correct for these issues using the best available consensus forecast derived from a third party source which could be Bloomberg, IBES or Factset. The Index Sponsor does not use Societe Generale research analyst forecasts in this process.

APPENDIX

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