Swiss Exchange

SIX Swiss Exchange Indices

Rules Governing The SPI Index Family

Stand 04.07.2017

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1 Index Structure

1.1 Securities universe

The Swiss Performance Index SPI® attempts to represent the development of the entire Swiss equity market. The SPI® therefore comprises all equities whose primary listing is on SIX Swiss Exchange. There are two exceptions:

– Equities with a free float of less than 20% are not included in the SPI® due to their limited liquidity (tradability).
– Investment companies are not included in the SPI®; this is to prevent companies from being counted twice. Investment companies that invest exclusively in companies with no primary listing on SIX Swiss Exchange may be admitted to the SPI® upon request.

In principle, only equities of Swiss companies domiciled in Switzerland are admitted to the SPI®. Upon request, a foreign-domiciled company with a primary listing may be included if it fulfils the conditions laid down in Section 3.2 et seq.

1.2 Sector indices and subindices

The securities universe of the SPI is divided into numerous business sectors. The sectors are determined in accordance with the Industry Classification Benchmark (ICB) of the FTSE. Sector indices are calculated for each sector. SPI securities are also divided according to size.

1.3 General principles

In order to achieve the stated index objective SIX Swiss Exchange defines the general principles that govern the index methodology. SIX Swiss Exchange publishes the index objective and rules for all indices.

– **Representative:**
  The development of the market is represented by the index.
– **Tradable:**
  The index components are tradable in terms of company size and market.
– **Replicable:**
  The development of the index can be replicated in practise with a portfolio.
– **Stable:**
  High index continuity.
– **Rules-based:**
  Index changes and calculations are rule-based.
– **Projectable:**
  Changes in rules are with appropriate lead time (usually at least 2 trading days) – no retrospective rule changes.
– **Transparent:**
  Decisions are based on public information.

1.4 Standardisation

The SPI was standardised on 1 June 1987 with an initial baseline value of 1000 points. Its divisor (see Section 2.2) was established such that the result of dividing the total market capitalisation by the divisor was an index level of 1000 points. The SPI price index (without dividend adjustment) was standardised on 31 December 1992 at $^{1}/_{10}$ of the relevant SPI values.

1.5 Index Commission

The Management Committee of SIX Swiss Exchange is supported by the Index Commission (advisory board) in all index-related matters, notably in connection with changes to the index rules and adjustments, additions and exclusions outside of the established review and acceptance period.

The Index Commission convenes at least twice a year. It provides valuable input on how existing products can be improved and new ones created.

1.6 Review of index concept

The validity of the index concepts and rules is reviewed on a regular basis. In exceptional cases a broad market consultation can be conducted. The changes to the index rules are publicly announced with appropriate lead time (usually 3 months).

1.7 Termination of the index calculation

A decision to discontinue will be publicly announced by SIX Swiss Exchange with appropriate lead time.

In case of existing financial products linked to the index, of which SIX Swiss Exchange is aware, a market consultation is conducted in advance and a transition period is introduced before the definitive termination.

2 Index Calculation

2.1 Laspeyres index formula

The SPI, like all other SIX Swiss Exchange indices, is calculated using the Laspeyres method with the weighted arithmetic mean of a defined number of securities issues. The index level is calculated by dividing the market capitalisation of all securities included in the index by a divisor.

$$I_s = \frac{\sum_{i=1}^{M} p_{i,s} * x_{i,t} * f_{i,t} * c_{i,t} * r_s}{D_t}$$

Legend:

t: Current day

s: Current time on day t

Is: Current index level at time **s**

D_t: Divisor on day **t**

M: Number of issues in index

$p_{i,s}$: Last-paid price of security

$x_{i,t}$: Number of shares of security **i** on day

$f_{i,t}$: Free float for security **i** on day **t**

$c_{i,t}$: Capping factor of security **i** on day **t** (if applicable[1])

r_s: Current CHF exchange rate at time **s**

2.2 Divisor

The divisor is a technical number used to calculate the index. If the market capitalisation changes due to a corporate event (see Section 4), the divisor changes while the index value remains the same.

[1] Currently used by the SPI Select Dividend 20

2.3 Treatment of dividends

The new divisor is calculated on the evening of the day before the corporate event takes effect.

The SPI is a dividend-adjusted performance index. It is also calculated as a price index in whose calculation dividend payments are not taken into account. The treatment of dividend payments is detailed in Section 4.3.

2.4 Free float

The securities included in the SPI are weighted according to their free float. This means that large share packages that reach or exceed the threshold of 5% are subtracted from the total market capitalisation.

The free float is calculated on the basis of outstanding shares. Issued and outstanding equity capital is, as a rule, the total amount of equity capital that has been fully subscribed and wholly or partially paid in and documented in the Commercial Registry. Conditional and authorised capital does not count as issued and outstanding equity capital.

The free float is calculated on the basis of listed shares only. Where a company has different categories of listed securities, these are considered separately for the purposes of calculating the index.

2.4.1 Shares in fixed ownership: definition

Fundamentally deemed to be shares held in firm hands are shareholdings that have been acquired by a person or group of persons in companies domiciled in Switzerland and which, upon exceeding or falling below the 5% or higher threshold values defined in Art. 120 FinfraG, have been reported to SIX Swiss Exchange.

The threshold values defined Art. 20 SESTA are, as of 5%, applicable analogously to companies domiciled abroad.

Shares of persons and groups of persons who are subject to a shareholder agreement which is binding for more than 5% of the listed shares or who, according to publicly known facts, have a long-term interest in a company are also deemed to be in fixed ownership.

2.4.2 Sources of information

For the calculation of the number of shares in firm hands, SIX Swiss Exchange may also use other sources than the reports submitted under Art. 120 FinfraG, Art. 55 Listing Rules and the Directive on Regular Reporting Obligations[2]. In particular, SIX Swiss Exchange may use data gained from issuer surveys that it conducts itself.

2.4.3 Exceptions

In principle, shares held by the following groups are deemed free-floating regardless of whether a report has been made pursuant to Section 2.4.1:

- Custodian nominees
- Trustee companies
- Investment funds
- Pension funds
- Investment companies

SIX Swiss Exchange classifies at its own discretion persons and groups of persons who, because of their area of activity or the absence of important information, cannot be clearly assigned.

The free-float rule applies only to bearer shares and registered shares. Capital issued in the form of participation certificates ("Partizipationsscheine") and bonus certificates ("Genussscheine") is taken into full account in calculating the index because it does not confer voting rights.

[2] https://www.six-exchange-regulation.com -> Regulations -> Listing Rules

2.5 Calculation interval and publication

The SPI and its subindices are calculated and published every three minutes. This does not apply to sector indices at the industry, sector and subsector levels, which are calculated and published only at the end of the day.

All index data is distributed by SIX Exfeed Ltd (indirect subsidiary of SIX Group Ltd).

2.6 Prices used

In calculating the index, the last-paid price is taken into account. If no price has been paid on the day of calculation, the bid price is used. In the absence of a bid price, the previous day's price is used. Only the prices achieved via the electronic order book of SIX Swiss Exchange are used.

2.7 Trading hours

The trading hours for Swiss equities, participation certificates and bonus certificates are determined by SIX Swiss Exchange.

Since the opening phase usually causes strong price fluctuations, the SPI is first calculated three minutes after the start of on order book trading. This index level is called the "open".

A closing auction takes place ten minutes before close of trading. At the close of trading, the final closing prices used in calculating the closing level of the SPI are established.

2.8 Final Settlement Value (FSV)

For the index options and futures expiry a Final Settlement Value (FSV) is calculated. The value is calculated using the first-paid price between 9:00:00 CET and 9:02:15 CET. If no price is available during this period for a component the last available price of the previous day is used.

3 Admission To And Exclusion From The Index

3.1 Admission and exclusion criterion: 20% free float

A minimum of twenty percent of the total shares of a given company must be free-floating for it to be admitted to the SPI.

In order for a security to remain in the index, the free float must remain at 20% or more. If the percentage falls below this minimum and does not reach it or surpass it within three months, the security in question is removed from the SPI Family.

Securities not included in the SPI because they do not meet the free-float condition are admitted to the index if the minimum free-float threshold of 20% has been exceeded continuously for three months.

The adjustment is made after a notification period of 10 trading days.

3.2 Reporting obligation for companies domiciled abroad

Companies domiciled abroad will, at the given company's request, be included in the SPI if they commit to fulfil the Directive Regular Reporting Obligations, requirement as defined by SIX Exchange Regulations[3].

If a company fails to comply with its reporting requirement, its shares will be excluded from the SPI family following an advance warning.

3.3 Listing of a foreign-domiciled company on more than one securities exchange

If a company domiciled abroad is not exclusively listed on SIX Swiss Exchange, the following criteria must be fulfilled:

– The company's shares are not already included in an internationally significant foreign benchmark index.
– At least 50% of the total turnover in the shares is generated on SIX Swiss Exchange or the liquidity ratio (turnover as a percentage of free float capitalisation) is at least 50%.

3.4 Admission of newly listed shares (IPOs)

As of their second day of public trading, new issues with a primary listing (IPOs) that belong to the securities universe described in Section 1.1 are admitted to the SPI and its sector and subindices on the second trading day with the closing price of the first trading day.

Foreign-domiciled companies that fulfil the reporting requirement under Section 3.2 may, at the request of the given company, also be included in the SPI as of the second trading day, as well as in sector-specific and sub-indices.

SIX Swiss Exchange reserves the right to carry out admission to the index in stages such as through the gradual increase of the number of shares or the free float.

[3] https://www.six-exchange-regulation.com -> Regulations -> Regular reporting obligations

4 Index Adjustments

4.1 Ordinary adjustments

The number of securities and free-float shares are adjusted on four ordinary adjustment dates a year:

– The third Friday in March (after close of trading)
– The third Friday in June (after close of trading)
– The third Friday in September (after close of trading)
– The third Friday in December (after close of trading)

SIX Swiss Exchange may conduct a capital survey among issuers in order to obtain the required data.

The announcement of the provisional new securities occurs at least one month before the adjustment date. SIX Swiss Exchange reserves the right to take account of recent changes before the adjustment date, so the definite new securities are announced only five trading days before the adjustment date.

4.2 Extraordinary adjustments

In order to avoid frequent slight changes to the weighting and to maintain the stability of the indices, any extraordinary change of the total number of outstanding securities or the free float with a 2 day notice period will only result in an extraordinary adjustment if it exceeds 10% and 5% respectively, occurs from one trading day to the next one and is in conjunction with a corporate action.

After a takeover, SIX Swiss Exchange may, in exceptional cases, adjust the free float of the company in question upon publication of the end results. A five-day notification period applies. At the same time, SIX Swiss Exchange may exclude the security from the relevant index family.

Where an insolvency has been announced, an extraordinary adjustment and an exclusion from the indices will be made, taking into account a notification period of 5 trading days.

In case SIX Regulation has confirmed a delisting, an exclusion from the indices will be made at the next upcoming ordinary adjustment date (March, June, September, December) taking into account a notification period of at least 5 trading days.

If a company is deleted from indices with a fixed number of constituents as result of a delisting, takeover or bankruptcy a replacement is determined based on the current selection list.

The foregoing notwithstanding, SIX Swiss Exchange reserves the right to make this adjustment, in exceptional cases, without observing the notification period.

4.3 Dividend and other payments

4.3.1 Regular cash dividend

Regular cash dividend payments do not result in adjustments to the divisors of price indices. Dividends are, however, fully taken account of in performance indices. Dividend payments are always treated as gross amounts, including the withholding tax portion.

	Divisor performance indices	Divisor price indices	Dividend points
Regular cash dividend	↘	→	Yes

4.3.2 Repayments of capital instead of a cash dividend

Repayments of capital through the reduction of a share's par value, which can take the place of a regular cash dividend or constitute a component of the regular distribution, are treated in the same way as a normal dividend payment (i.e. no adjustment to the price index divisor).

	Divisor performance indices	**Divisor price indices**	**Dividend points**
Repayments of capital instead of a cash dividend	➘	➔	Yes

4.3.3 Extraordinary payments

Distributions (e.g., special dividends and anniversary bonuses) that, contrary to the company's usual dividend policy, are paid out or declared extraordinary dividends, are not deemed dividends in the above sense. These distributions are considered corporate events and also result in adjustments to the divisors of price indices.

	Divisor performance indices	**Divisor price indices**	**Dividend points**
Extraordinary payments	➘	➘	No

4.3.4 Share dividend (company's own shares)

Share dividends are not treated like ordinary dividend payments. The increase in the number of shares is offset by the lower price of the share on the ex date. The capitalisation does not change in total and the divisors are not adjusted.

	Divisor performance indices	**Divisor price indices**	**Dividend points**
Share dividend (company's own shares)	➔	➔	No

4.3.5 Share dividend (shares of another company)

The distribution of a dividend on shares of another company is not classified as an ordinary dividend payment and so necessitates an adjustment of the price index divisor.

	Divisor performance indices	**Divisor price indices**	**Dividend points**
Share dividend (shares of another company)	➘	➘	No

4.3.6 Extraordinary situations

At variance to the treatment of dividends and other distributions described in Section 4.3.1 through 4.3.5, SIX Swiss Exchange reserves the right in justifiable instances to diverge from those provisions.

4.4 Information on corporate events

Any relevant forthcoming extraordinary corporate events that result in an adjustment to the indices are published by e-mail via Investor Service Equity.

The registration form is available on the SIX Swiss Exchange Website. SIX Swiss Exchange accepts no liability for Investor Service Equity.

4.5 Trade suspensions and market distorsions

Should a data source (for example a price source) not be available as result of challenging economic conditions or other market distortions the last available data will normally be used.

In extreme cases a deviation from the rules defined in this rulebook can occur, for example, shifting the schedule of a regular index review.

All changes will be publicly announced at least two trading days in advance.

4.6 Index corrections

Index corrections distinguish between calculation errors and incorrect input data.

Calculation errors detected within a trading day are corrected immediately. Intraday tick data are not corrected retrospectively.

Calculation errors that are older or based on erroneous input data are corrected if technically possible and economically viable. If significant differences exist, index values can also be corrected retrospectively.

Interested parties may subscribe to an e-mail notifications service on the website. SIX Swiss Exchange distributes notifications over this channel on

- Changes in corporate actions and dividends
- Updates to the periodic index reviews
- Problems and error in the index calculation
- The launch of new indices
- General information on SMI indices

5 Sector Indices

Since 3 January 2006, the sector indices have been based on the Industry Classification Benchmark (ICB) developed by FTSE.

A performance and a price index are calculated for each sector as soon as at least one security can be allocated to the index.

The calculation of the SPI sector indices came to a definite end with the introduction of ICB. The sector indices were migrated to the ICB structure at the Economic Sector and Market Sector levels as of 30 December 2005. The SPI sector indices at the Industry Group and Sub-Group levels, however, were not integrated into the new structure.

5.1 Standardisation

ICB	Indices	Standardisation	Old basis	New basis
Industries and supersectors	Performance indices (TR)	31.12.1999	1000	1000
	Price indices (PR)	31.12.1999	100	1000
Sectors and subsectors	Performance indices (TR)	30.12.2005	-	1000
	Price indices (PR)	30.12.2005	-	1000

5.2 Calculation interval

Level	interval	Frequency	Start of calculation
Level 1: industries	End-of-day	-	-
Level 2: supersectors	3 minutes	180s	9:00 a.m.
Level 3: sectors	End-of-day	-	-
Level 4: subsectors	End-of-day	-	-

5.3 Sector structure

The current ICB sector structure can be downloaded from the website of the FTSE:

www.icbenchmark.com

6 Subindices by size

6.1 Securities universe

The SPI is divided into subindices according to size. The following subindices are calculated:

- SPI Large
- SPI Mid
- SPI Small
- SPI Mid & Large
- SPI Small & Mid
- SPI EXTRA
- SPI ex SLI

The SPI Large comprises the 20 largest securities of the SPI. The SPI Mid comprises the following 80 securities and, pursuant to the selection list (see Section 6.3), the rest of the securities constitute the SPI Small.

The SPI Mid & Large and the SPI Small & Mid are combinations of the first three indices in the above list.

The SPI EXTRA and SPI ex SLI securities universe is identical to that of the SPI without the securities of the SMI or SLI (see Sections 6.6 and 6.7).

6.2 Adjustment date

Changes to the composition of the index basket are made once a year on the second ordinary adjustment date of the year, i.e. on the third Friday in September after close of trading (see Section 4.1).

After admission of a new security following an IPO, an extraordinary reallocation is carried out (see Section 6.5).

6.3 Determination of rankings

A selection list in which all SPI securities are ranked and which forms the basis for the rankings can be downloaded from the SIX Swiss Exchange Website. The position of each security is determined on the basis of the average free-float capitalisation (compared to the capitalisation of the entire SPI) over the last 12 months.

For the ordinary index review the time period used for the calculations is 1 July through 30 June of the following year At the cut-off dates September 30, December 31 and March 31 a provisional selection list based on the average free-float market capitalisation over the last 12 months is created.

6.4 Reallocation criteria

In order to maintain the stability of the subindices as far as size is concerned, the selection list features a tolerance zone which inhibits changes to the composition. This tolerance zone is +/-10%. In the SPI Large, which comprises 20 securities, it encompasses positions 19 through 22; in the SPI Mid, which comprises 80 securities, it encompasses positions 93 through 108.

– A security is reallocated from the SPI Mid to SPI Large if it is in position 18 or higher. Similarly, a security is reallocated from the SPI Large to the SPI Mid if it is in position 23 or lower.
– A security in the position of 19 or 20 is reallocated to SPI Large if at the same time another security from the SPI Large meets the condition for relegation (position 23 or lower) and no security from the SPI Mid that is rated higher or meets the admission criteria (position 18 or higher) has moved up. This applies analogously for positions 21 and 22 in connection with reallocations to the SPI Mid.
– A security is reallocated from the SPI Small to the SPI Mid if it is in position 92 or higher. Similarly, a security is reallocated from the SPI Mid to the SPI Small if it is in position 109 or lower.
– A security at a position of between 93 and 100 in the tolerance zone is reallocated to the SPI Mid if at the same time another security from the SPI Mid meets the condition for relegation (position 109 or lower) and no security from the SPI Small that is rated higher or meets the admission criteria (position 92 or higher) has moved up. This applies analogously for positions 101 through 108 in connection with reallocations to the SPI Small.

6.5 Extraordinary reallocation

When shares with a new primary listing are admitted to the SPI pursuant to Section 3.4, allocation to a subindex based on size is carried out, if necessary along with the reallocation of an existing SPI share.

In principle, allocation is based on free-float capitalisation at the end of the first trading day. However, the power to make such decisions lies with the Management Committee of SIX Swiss Exchange.

6.6 SPI EXTRA

In April 2004, the SPI EXTRA was introduced as an alternative to the SPI Small & Mid in order to preclude any overlap with SMI issues.

The securities universe of the SPI EXTRA is identical to that of the SPI not including the securities of the SMI. The SPI EXTRA was standardised as follows:

Index	Symbol	Standardisation
SPI EXTRA® Performance (TR)	SPIEX	1000 points on 31.12.1999
SPI EXTRA® Price (PR)	SPIEXX	100 points on 31.12.1999

Historical price data has been available since 1 January 1996.

6.7 SPI ex SLI

To track the development outside the SLI, the SPI ex SLI was introduced in September 2007. This Index includes all securities of the SPI excluding the SLI, and thus serves as a benchmark for these. The SPI ex SLI was standardised as follows:

Index	Symbol	Standardisation
SPI ex SLI (TR)	SXSLI	1000 Punkte per 31.12.1999
SPI ex SLI (PR)	SXSLIX	1000 Punkte per 31.12.1999

Historical price data has been available since 31 December 1999.

7 SPI SELECT DIVIDEND 20

7.1 Securities universe

The SPI Select Dividend 20 Index includes the 20 stocks which represent the highest-yielding companies with a stable dividend paying record and solid profitability from all stocks in the SPI index.

7.2 Adjustment date

Changes to the composition of the index basket are made once a year on the first ordinary adjustment date of the year, i.e. on the third Friday in March after close of trading (see Section 4.1).

7.3 Standardisation

Name	Symbol	Date	Points
SPI® Select Dividend 20 TR	SDIVIC	19.03.2007	1000
SPI® Select Dividend 20 PR	SDIVI	19.03.2007	1000

7.4 Weighting scheme

The weight of each constituent is based on the free float market capitalization and the normalized dividend yield calculated at the annual index review.

Additionally, the weight of each security is verified on quarterly basis: If the weighting of a security were to exceed 15%, the weight of the security will be limited ("capped") at 15%.

$$c_i = \frac{DY_i \times Cap_{15\%i}}{\max\limits_{k \in (1,N)} \left[DY_k \times Cap_{15\%k} \right]}$$

Legend:

c_i:	Capping factor of security **i**
DY_i:	Dividend Yield of security **i**
$Cap_{15\%\,k}$:	Capping factor at 15% of security **k**

For the quarterly cut-off date of the calculations of the multiplier and capping, the closing price of the Thursday previous to the second Friday of March, June, September and December is used.

7.5 Inclusion criteria

At the annual review in March for determining the membership, a pre-selection list is created. To qualify for the list a security from the SPI index must fulfil the following criteria:

- An average daily traded volume (ADTV) over the last 12 months of at least 2 million CHF.
- All stocks must have distributed dividends at least in the last 4 out of 5 financial years. This includes the current year’s dividend announcement or payment and the previous 4 years’ payments.
- A positive pay-out ratio (gross dividend per share divided by the earnings per share): All companies with a positive pay-out ratio qualify unless they are among the largest 10% of all companies with the highest ratios.

7.6 Determination of rankings and selection of securities

The stocks fulfilling the inclusion criteria are ranked by dividend yield (gross dividend per share dividend by the price) in descending order first. The 30 highest ranked companies will compose the final selection list. For companies with more than one share line meeting the filter criteria, the line with the higher dividend yield is chosen for the selection list. If less than 30 companies meet the criteria specified above, then all of them will compose the selection list.

The final rank for the selection list is obtained by sorting the companies by the return on capital in descending order.

The 20 highest ranked companies are selected as index components.

7.7 Mergers, acquisitions and bankruptcy

Companies deleted due to mergers, acquisitions or bankruptcy are not replaced immediately. At the next quarterly rebalancing, the highest ranked non-component(s) from the latest selection list will be added until the index is back to the original count of 20 components. The replacement company will enter the index based on the free float market capitalization and the normalized dividend yield calculated at the last annual index review.

8 SPI MULTI PREMIA Indices

Seven single-premium indices and one multi-premia index are calculated on the basis of the SPI using the combinations of price/return and EUR/CHF. The SPI Multi Premia Index is constructed by first selecting and weighting the constituents of the single-premium indices. The SPI Multi Premia Index is then arrived at by aggregating the seven SPI single-premium indices. In the sections that follow, the cut-off date for data collection is the Friday four weeks prior to the ordinary adjustment date, as described in section 4.1 At this point in time all data to allocate the index is fixed. The composition of the index is determined anew on each of the ordinary adjustment dates.

8.1 Securities universe

In order to determine the composition of the single-premium indices, 60 suitable components from the SPI are defined as candidates for inclusion in the indices on the cut-off date each year in September. Suitable equities are the 60 best-ranked listings on the basis of the Equity Selection List (free-float market capitalization and on-order book turnover) for which on the cut-off date a pricing history that goes back at least three years is available. In cases of multiple listings for the same company, only the best-ranked listing is taken into consideration. In order to reduce turnover, preference is given to existing candidates in that they are only removed from the selection list if they are no longer among the 66 best ranked, suitable components from the SPI on the cut-off date. A removed candidate will be replaced by the best ranked component of the SPI not in the universe.

8.2 Selection for single-premium indices

The 60 candidates are tested for specific properties for each of the seven single-premium indices in sequence. This is done combining various indicators that reflect the relevant factor premium in each case.

They are standardized as follows in order to ensure that the individual indicators can be compared and combined:

$$z_i = \frac{S_i - \bar{S}}{\sigma(S)}$$

In this case $\mathbf{S_i}$ represents one of the indicators for the candidate **i**, such as its price-to-book-value ratio, **S** is the mean and **σ(S)** is the standard deviation of the same indicator for all candidates for which the corresponding indicator is available.

In order to reduce sensitivity to statistical outliers, the figures for each indicator that lie below the 5th percentile or above the 95_{th} percentile are adjusted to be equivalent to the 5_{th} and 95_{th} percentiles respectively before the standardization.

In the next step, the recorded indicators are used to arrive at an aggregated factor score for each of the seven single-premium indices that reflects the factor-specific properties of the share in question. The aggregated factor scores are calculated by adding the standardized indicators together as follows:

$$Aggregated - Factor - Score_i^j = \sum_{k=1}^{m} \varphi^k z_i^k$$

In this case m represents the number of indicators recorded for the factor premium j. $\mathbf{z_i^k}$ is the standardized indicator **k** for the candidate **i.** $\boldsymbol{\varphi^k}$ is the weighting for the indicator $\mathbf{z_i^k}$, with all weightings adding up to 1, $\sum_{k=1}^{m} \varphi^k = 1$.

In order for a candidate to be included in a single-premium index, all of the indicators described in the following sections of this chapter must be available.

8.2.1 Value premium

Two groups of underlying value indicators are used to select the components of the SPI Value Premium Index:

Indicator of net asset value:

– Ratio of book to price value (**B/P**): The recorded book value per share is divided by the price on the cut-off date.

Indicators of earnings power:

– Ratio of earnings to price (**E/P**): The recorded earnings per share are divided by the price on the cut-off date.
– Dividend yield (**D/P**): The recorded dividend per share is divided by the price on the cut-off date.

Both of these groups of indicators are assigned a weighting of 50% in order to arrive at the aggregated value score. The indicators that make up the earnings value group are also assigned equal weighting. This gives us the following formula for calculating the aggregated value score (see section 8.2):

$$Aggregated-Factor-Score_i^{Value}=\frac{1}{2}z_i^{B/P}+\frac{1}{4}z_i^{E/P}+\frac{1}{4}z_i^{D/P}$$

8.2.2 Size premium

Two indicators are used to select the components of the SPI Size Premium Index:

– The average logarithmized free-float market capitalization (**MCAP**) on the cut-off date.
– The company's logarithmized total assets (**TotalAssets**)

Both of the indicators are assigned equal weighting in order to arrive at the aggregated Size score (see section 8.2):

$$Aggregated-Factor-Score_i^{Size}=\frac{1}{2}z_i^{MCAP}+\frac{1}{2}z_i^{TotalAssets}$$

8.2.3 Momentum premium

Two indicators are used to select the components of the SPI Momentum Premium Index:

– the 52 minus 4 weeks total return (**52-4 TR**)
– the 26 minus 4 weeks total return (**26-4 TR**)

X minus 4 weeks total return means that the return on the ordinary adjustment date minus X weeks is calculated by the adjustment date minus 4 weeks.

Both of the indicators are assigned equal weighting in order to arrive at the aggregated momentum score (see section 8.2):

$$Aggregated-Factor-Score_i^{Momentum}=\frac{1}{2}z_i^{52-4TR}+\frac{1}{2}z_i^{26-4TR}$$

8.2.4 Residual momentum premium

Two indicators are used to select the components of the SPI Residual Momentum Premium Index:

- the 52 minus 4 weeks residual return (**52-4 RR**)
- the 26 minus 4 weeks residual return (**26-4 RR**)

Residual returns (**RR**) represent the excess returns at the component level, irrespective of the reference market[4].

X minus 4 weeks residual return means that the residual return on the ordinary adjustment date minus X weeks is calculated by the adjustment date minus 4 weeks (cut-off date).

Both of the indicators are assigned equal weighting in order to arrive at the aggregated residual momentum score (see section 8.2):

$$Aggregated - Factor - Score_i^{ResidualMomentum} = \frac{1}{2} z_i^{52-4RR} + \frac{1}{2} z_i^{26-4RR}$$

8.2.5 Reversal premium

Two indicators are used to select the components of the SPI Reversal Premium Index:

- 260 minus 52 weeks total return (**260-52 TR**)
- 156 minus 52 weeks total return (**156-52 TR**)

X minus 52 weeks total return means that the return on the ordinary adjustment date minus X weeks is calculated by the adjustment date minus 52 weeks.

Both of the indicators are assigned equal weighting in order to arrive at the aggregated reversal score (see section 8.2):

$$Aggregated - Factor - Score_i^{Reversal} = \frac{1}{2} z_i^{260-52TR} + \frac{1}{2} z_i^{156-52TR}$$

8.2.6 Low-risk premium

Three indicators are used to select the components of the SPI Low Risk Premium Index:

- Volatility of the total return (**Vola**)
- 90% value-at-risk for the total returns (**VaR**)
- correlation coefficient between the total returns of the share and the total return for the SPI (**Correl**).

All indicators are calculated on the basis of the same weekly data covering a period of 156 weeks.

All three indicators are assigned equal weighting in order to arrive at the aggregated low-risk score (see section 8.2):

$$Aggregated - Factor - Score_i^{LowRisk} = \frac{1}{3} z_i^{Vola} + \frac{1}{3} z_i^{VaR} + \frac{1}{3} z_i^{Correl}$$

[4] For the calculation a CAPM regression over 156 weeks on SPI returns is used.

8.2.7 Quality premium

Two indicators are used to select the components of the SPI Quality Premium Index:

- Return on assets (**RoA**):
  The gross income recorded for the company is divided by the recorded value of its assets.
- Net profit margin (**NetMargin**):
  The recorded earnings per share are divided by the recorded revenue per share.

Both of the indicators are assigned a weighting of 50% in order to arrive at the aggregated quality score (see section 8.2):

$$Aggregated - Factor - Score_i^{Quality} = \frac{1}{2} z_i^{RoA} + \frac{1}{2} z_i^{NetMargin}$$

8.2.8 The selection process

The components of the single-premium indices are determined on the basis of the corresponding aggregated factor scores. This involves listing the aggregated factor scores for the value, momentum, residual momentum and quality indices in descending order and the score for the size, reversal and low-risk indices in ascending order. The best 30 candidates in each case are then selected.

In order to reduce turnover, preference is give to existing components in that they are only removed from the index if their ranking falls below 33. Any components that are removed are replaced by the next-best candidate that was not previously included in the index.

8.3 Weighting of shares

Unlike most other indices, the SPI multi-premia indices use a risk-based weighting pattern.

8.3.1 Risk parity

Risk parity is when a portfolio's risks are divided evenly between the various different sources of risk (e.g. index components or sub-indices). The relative contribution to risk from a particular risk source is defined as follows in cases of risk-parity weighting:

$$rc_i = w_i \frac{\left(\frac{\partial \sigma(w)}{\partial w_i}\right)}{\sigma(w)}$$

In this case $\mathbf{w_i}$ represents the weighting of the risk source **i** and **σ(w)** the measure of risk (e.g. volatility or tracking error) in relation to the index weightings **w**. The risk contributions add up to 1, i.e. $\sum_{i=1}^{n} rc_i = 1$.

The following optimization problem is solved in order to arrive at the weightings in accordance with the principle of risk parity:

$$w^* = \underset{w}{\operatorname{argmin}} \sum_{i=1}^{n} (rc_i - \frac{1}{n})^2$$

This optimization problem minimizes the total of the squared deviations between the risk contributions of the individual risk sources $\mathbf{rc_i}$ and the desired risk contribution of **1/n**. This gives us a balanced, individual risk contribution for each risk source.

8.3.2 Weighting of the single-factor indices

The weighting of the components in the single-factor indices is determined in accordance with the principle of risk parity. The procedure is described in section 8.3.1 above.

The index components serve as the risk sources, while volatility is used as the measure of risk.

The covariance is determined on the basis of the weekly total return time series for the single-premium index components over a period of 156 weeks.

The secondary conditions for risk parity optimization are:

– The index is always fully invested $\sum_{i=1}^{n} w_i = 1$.
– The weighting of a single component amounts to between 0% and 8%**:** $0 \leq w_i \leq 0.08$.
– The weighting of a given component is limited to double a reference weighting comprising a combination of free-float market capitalization and an on-order-book-based reference weighting w_i^{ref}: $w_i \leq 3 * w_i^{ref}$. The reference weighting of a component is calculated as the theoretical market capitalization weighting in a portfolio consisting of the same components and a maximum weighting for individual stocks of 8%.

As part of the optimization process, the squared deviations between the new and previous weightings are also penalised in order to further reduce the index's turnover.

8.4 Selection for the Multi Premia Index

The Multi Premia Index comprises seven single-factor portfolios as index components.

8.5 Weighting of equities in the Multi Premia Index

The weighting of the components in the multi-factor index is determined in accordance with the principle of risk parity. The procedure is described in section 8.3.1 above.

In contrast to the single-factor indices, the single-factor indices themselves are used as risk sources for the multi-factor index. The tracking error with respect to the SPI over a period of 156 weeks is used as the measure of risk.

The secondary conditions for risk parity optimization are:

– The index is always fully invested $\sum_{i=1}^{7} w_i = 1$
– The weighting of a single-premium index amounts to between 11% and 17.5%: $0.11 \leq w_i \leq 0.175$

9 SPI 20

The SPI 20 Index covers the SMI without the component capping, i.e. the composition is the same while the weighting defers. All components of the SPI 20 are weighted by their free float market capitalisation at the respective review date.

The component selection and the communication follow the schedule of the SMI (for details see the SMI Rulebook).

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11 Contact

Information concerning the indices of SIX Swiss Exchange (index adjustments, announcements etc.) is available at the following Internet address:

http://www.six-swiss-exchange.com/indices_en.html

Any requests with respect to the indices may be directed to the following address:

SIX Swiss Exchange Ltd
Pfingstweidstrasse 110
P.O. Box
CH-8021 Zurich

Email: indexsupport@six-group.com
Phone: +41(0)58 399 22 29

12 Static Data

A current list of all indices calculated by SIX Swiss Exchange is accessible at the SIX Swiss Exchange Website:

https://www.six-swiss-exchange.com/.../calculated_indices.xls

SIX Swiss Exchange Ltd

Pfingstweidstrasse 110
P.O. Box
CH-8021 Zurich

T +41 58 399 5454
F +41 58 499 5455