

Factor Certificates

Full speed ahead with constant leverage



Factor Certificates are a way of investing in either rising or falling markets with no term limitation and constant leverage.

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Factor Certificates

Constant leverage every day

Factor Certificates allow investors to participate disproportionately in up- or downtrends. Every day, the percentage amount by which the underlying asset has moved is multiplied by a constant factor (leverage). The factor determines the degree of the leveraged participation, while the product variant specifies the direction: Long for rising prices and Short for falling prices.

The key features at a glance:

- Steadily leveraged participation in clear price trends
- Long variant for uptrends, Short variant for downtrends
- Constant leverage (factor) thanks to daily adjustment of product parameters
- No term limitation (open end)
- No (direct) impact on pricing from volatility
- Adjustment mechanism significantly reduces the probability of a knock-out event
- Not suitable for markets moving sideways or with no clear trend



Daily returns leveraged by a constant factor

Factor Certificates are an easy and transparent way for investors to participate disproportionately in the daily performance of the underlying asset (e.g. share, index, currency, commodity). The percentage change in the closing price of the underlying is multiplied by a constant factor. The best way to explain the factor mechanism is with some highly simplified examples*: for instance, if today's closing price of the underlying is 2% higher than yesterday's close, then a 5x Long Factor Certificate will reflect a price increase of around 10%. The relationship works the other way round for Short Factor Certificates: for instance, if today's closing price of the underlying is 2% lower than yesterday's close, then a 5x Short Factor Certificate will reflect a price increase of around 10%.

If the underlying does not move in the direction expected, losses are also disproportionate. A 5x Long Factor Certificate would show a 10% decline if the underlying falls by 2%, and a 5x Short Factor Certificate would show a 10% decline if the underlying rises by 2%. The leverage works in both directions; both the risks and the rewards are disproportionate. The higher the factor, the greater both the risks and the opportunities. In the worst-case scenario, a total loss is possible.

How does the factor effect work?

To explain* the economic difference between a direct investment, e.g. in a share, and buying a Factor Certificate, we assume that today's closing price of a share in Sample AG is CHF 100 and a direct investor buys this share at this price just before the close. If the share price closes at CHF 102 the following day, the direct investor has made a return of CHF 2 or 2%, which could be realized by selling the share.

What is the situation for someone buying a Factor Certificate expecting prices to rise and looking to participate disproportionately, e.g. by a factor of 5? The idea can be implemented with a 5x Long Factor Certificate. In economic terms, the factor number is the ratio of equity to debt; the higher the factor, the lower the percentage of equity.

Instead of buying shares in Sample AG for CHF 100, as in our example above, the investor could also buy a 5x Long Certificate for CHF 20. The percentage of equity would only be 20% and the remaining CHF 80 is provided by the issuer as debt. Following the assumed price increase in Sample AG shares from CHF 100 to CHF 102, the investor has again made CHF 2 in profit, but the return on equity has risen from 2% to 10%. It is higher by a factor of 5. If the investor wishes to invest CHF 100, they could buy five 5x Long Certificates. That way, for the same investment of CHF 100 the profit would increase to $\text{CHF } 2 \times 5 = \text{CHF } 10$. Committing the same amount of capital produces a profit that is higher by the factor of 5. This is known as the factor effect or the leverage effect.

* Ignoring product and transaction costs.

Fig. 1 Positive performance of the underlying

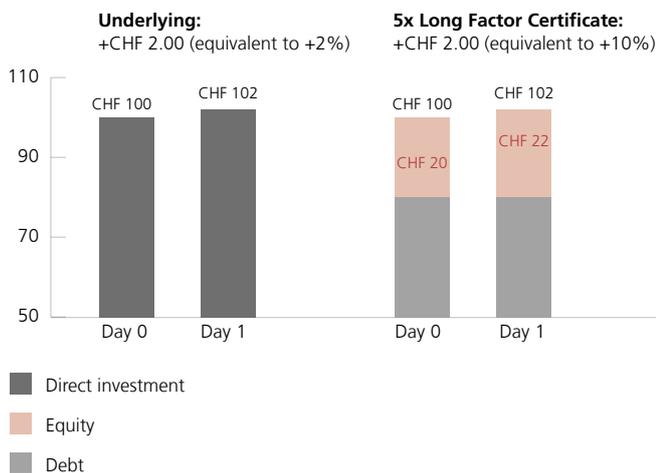
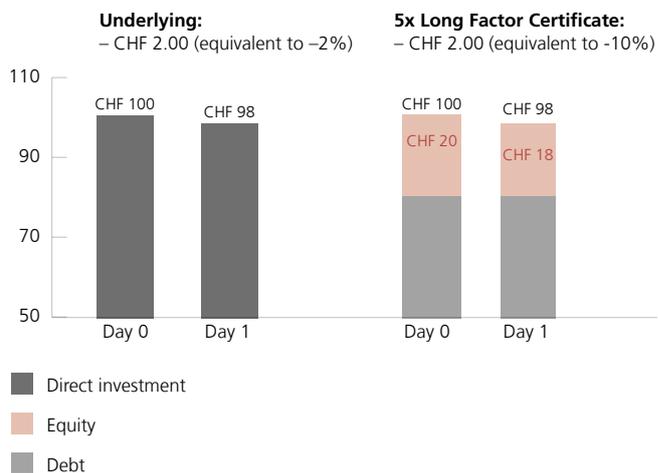


Fig. 2 Negative performance of the underlying



In this ideal example*, the starting position of CHF 20 of equity is equal to the current price of the 5x Long Factor Certificate, and the CHF 80 provided by the issuer would be exactly the strike of this certificate. If the price of Sample AG shares rises from CHF 100 to CHF 102, the price of the Factor Certificate would also increase from CHF 20 to CHF 22.

If the share price goes down, the downside of the leverage effect is apparent: If Sample AG shares fall from CHF 100 to CHF 98, the loss for a direct investor is only 2%, whereas a buyer of a Factor Certificate faces a 10% loss, as the price of the Factor Certificate goes down from CHF 20 to CHF 18.

* Ignoring product and transaction costs.

How can the factor/leverage remain constant?

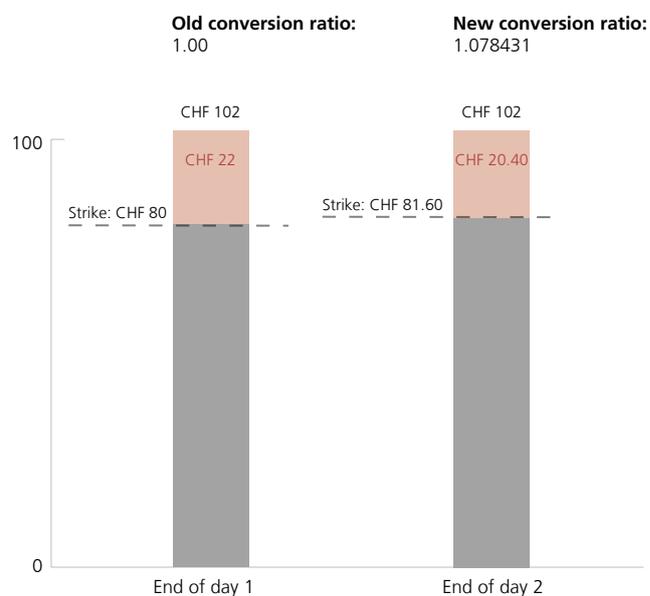
The most important feature of a Factor Certificate is the constant leverage. In order for the factor to remain constant after the price of the underlying has moved, and hence the certificate remains in line with the closing prices, the product parameters have to be adapted. If we again assume the scenario* where the price of the Sample AG share rises, the stock will close on day 1 at CHF 102 and the 5x Long Factor Certificate at CHF 22.

The parameters of the Factor Certificate thus have to be adapted to the new closing price of the stock so the percentage of equity and thus the price of the Factor Certificate is again equal to precisely one-fifth of the share price, i.e. CHF 20.40. This means that the new strike is exactly equal to the remaining percentage (80%) of the new share price, i.e. CHF 81.60.

To ensure that the Factor Certificate does not suffer a loss as a result of the price adjustment from CHF 22 to CHF 20.40, the conversion ratio is adjusted accordingly. This ensures that the performance of the previous day is reflected correctly, be it positive or negative. The process of adjusting the strike and the conversion ratio can be simulated for explanatory purposes by closing out the positions and reinvesting in a new Factor Certificate.

In the previous example, Sample AG shares closed on day 1 at CHF 102, the 5x Long Factor Certificate was worth CHF 22 and the conversion ratio was 1, because the investor held exactly one certificate. Closing out the position results in the investor holding CHF 22 in cash. The new 5x

Fig. 3



Long Factor Certificate is worth CHF 20.40 once the strike has been adjusted to CHF 81.60 (CHF 102 – CHF 81.60). The investor's CHF 22 of cash is invested in the new Factor Certificate. With CHF 22, the investor can buy 1.078431 new Factor Certificates (CHF 22 divided by CHF 20.40), which are credited to their portfolio. The value of the portfolio has not changed: instead of CHF 22, the investor now holds CHF 20.40 x 1.078431; this is equal to CHF 22. So the conversion ratio is now 1.078431.

* Ignoring product and transaction costs.

Reset and knock-out event

What happens when the underlying does not move in the direction expected? Is a total loss possible?

As mentioned above, both losses and profits are disproportionate with Factor Certificates. There is also the risk of a total loss. This occurs when the value of the underlying is at or below the strike on the same trading day (i.e. intraday). In our example, this would be if the Sample AG shares fell to or below CHF 80. This is called a knock-out event and the investor's CHF 20 of equity is wiped out. For the issuer, this means the share price is exactly equal to the amount the investor has provided. Even a price of CHF 79.99 is already a loss of one centime for the issuer. In a similar forward transaction (e.g. with futures), the investor would now have to remargin and thus would lose more than the original investment of CHF 20. With Factor Certificates, there is no such obligation to contribute more capital: investors cannot lose more than the amount originally invested.

To avoid the scenario of a knock-out as far as possible, UBS Factor Certificates have a reset mechanism. In our example, the reset barrier for the 5x Long Factor Certificate might be at CHF 82, for example. If the underlying touches this level and triggers a reset event, the Factor Certificate is adjusted during the trading period. The residual CHF 2 is reinvested in the Factor Certificate with the new parameters. As after a regular adjustment, the new strike is now 4/5 of the share price, i.e. CHF 65.60. However, the remaining CHF 2 is not enough to fully finance the remaining equity share of CHF 16.40 (CHF 82 – CHF 65.60), so the new conversion ratio is 0.121951 (= CHF 2 divided by CHF 16.40). Ultimately, the factor 5 is restored, but the investor is now only contributing 0.121951 of a share and not a full share as before the reset event.

Important: The reset mechanism attempts to prevent a knock-out event and thus a total loss. The possibility that the price of the underlying moves so quickly the reset mechanism is unable to take effect cannot be ruled out. If this happens, a knock-out event occurs and the investor suffers a total loss.

* Ignoring product and transaction costs.

Key features of Factor Certificates

What are the costs and how are these reflected in the Factor Certificate?

The financing costs of Factor Certificates are covered by the conversion ratio. Financing costs are incurred for the provision of the portion of the underlying that is in excess of the investor's equity. The higher the factor, the lower the investor's equity portion and thus the higher the issuer's portion and the associated financing costs. To reflect these costs, a standard reference interest rate is normally used (e.g. the CHF-LIBOR-overnight rate, or its successor SARON) plus a financing spread. A security fee is also charged. These cost items tend to reduce the conversion ratio and in doing so reduce value. The financing spread and the security fee can be viewed at any time on the UBS website keyinvest-ch-en.ubs.com.

How does the constant leverage work over multiple trading days?

If Factor Certificates are to be successful, it is important to have a clear price trend.

The performance of the Factor Certificate is driven not just by the direction in which the price of the underlying is moving, but also by the exact way in which it moves. This "path dependency" is a typical feature of Factor Certificates. If the trend is clear over several days, this path dependency is an advantage, as the constantly leveraged percentage performance is calculated based on the steadily rising value of the certificate. This accentuates the leverage effect, and is comparable to the compound interest effect.

If a share price rises steadily, Long Factor Certificates tend to gain not just disproportionately, but also exponentially. Equally, Short Factor Certificates lose value as expected if the share price rises steadily. However, the constantly leveraged percentage performance is based on an ever-diminishing certificate value, with the result that the losses are “slowed down”. Because the calculation basis plays a crucial role, this phenomenon is often called the “base effect”.

The same principles apply in reverse when a share price falls steadily.

But path dependency can have a negative impact if the underlying starts, for example, at CHF 100 and in the following days alternately rises and falls with no clear trend, ending the period back at CHF 100. A direct investor

would make neither profits nor losses over the period, but a Factor Certificate will tend to generate a loss. The higher the factor, the greater the loss when the underlying moves sideways with no trend.

Below, we show you three typical price scenarios to demonstrate the path dependency of Long and Short Factor Certificates. For reasons of simplicity, we only consider the leverage component in each scenario, ignoring such other components as interest, dividends and costs.



Scenario 1: Stable price trend – share price rises steadily

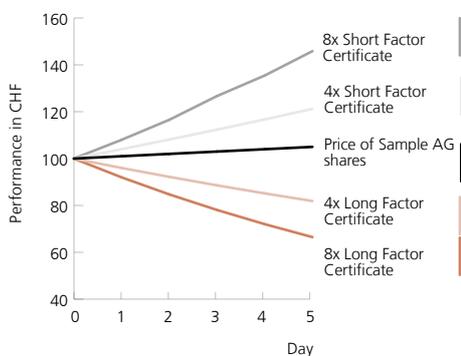
At the start of the period (day 0), Sample AG shares are trading at CHF 100 and they rise by CHF 1 a day for the next five days. The chart shows two effects with Factor Certificates: the leverage effect and the base effect.

The leverage effect is already clearly apparent after day 1. The Long Factor Certificates rise disproportionately in value: the higher the factor, the greater the increase in value. For Short Factor Certificates, the loss is disproportionate: the higher the factor, the greater the loss.

The base effect is important when looking over several days: if a share price rises steadily, Long Factor Certificates tend to gain not just disproportionately, but also exponentially. The base effect has a positive impact on the Short Factor Certificates too: the constantly leveraged percentage change based on an ever-diminishing certificate value acts as a brake on the losses.

Tab. 1: Share price rises steadily

Performance of Sample AG shares				4x Long Factor Certificate			8x Long Factor Certificate		
Day	Price of Sample AG shares in CHF	Change from previous day	Performance from initial value	Value	Change from previous day	Performance from initial value	Value	Change from previous day	Performance from initial value
0	100.00	-	-	100.00	-	-	100.00	-	-
1	101.00	1.00%	1.00%	104.00	4.00%	4.00%	108.00	8.00%	8.00%
2	102.00	0.99%	2.00%	108.12	3.96%	8.12%	116.55	7.92%	16.55%
3	103.00	0.98%	3.00%	112.36	3.92%	12.36%	125.69	7.84%	25.69%
4	104.00	0.97%	4.00%	116.72	3.88%	16.72%	135.45	7.76%	35.45%
5	105.00	0.96%	5.00%	121.21	3.85%	21.21%	145.85	7.68%	45.85%



4x Short Factor Certificate			8x Short Factor Certificate		
Value	Change from previous day	Performance from initial value	Value	Change from previous day	Performance from initial value
100.00	-	-	100.00	-	-
96.00	-4.00%	-4.00%	92.00	-8.00%	-8.00%
92.20	-3.96%	-7.80%	84.71	-7.92%	-15.29%
88.58	-3.92%	-11.42%	78.07	-7.84%	-21.93%
85.15	-3.88%	-14.85%	72.01	-7.76%	-27.99%
81.88	-3.84%	-18.12%	66.48	-7.68%	-33.52%

Scenario 2: Stable price trend – share price falls steadily

In the second scenario, Sample AG shares again start on day 0 at CHF 100. However, the price falls by CHF 1 every day for the next five days.

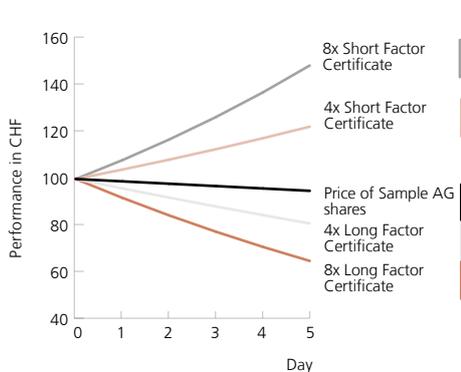
Again, the leverage effect is already clearly apparent after day 1. The Short Factor Certificates rise disproportionately in value: the higher the factor, the greater the increase in

value. For Long Factor Certificates the loss is disproportionate: the higher the factor, the greater the loss.

Owing to the base effect, if a share price falls steadily, Short Factor Certificates gain not just disproportionately but also exponentially. With the Long Factor Certificates, losses diminish in absolute terms.

Tab. 2: Share price falls steadily

Performance of Sample AG shares			4x Long Factor Certificate			8x Long Factor Certificate			
Day	Price of Sample AG shares in CHF	Change from previous day	Performance from initial value	Value	Change from previous day	Performance from initial value	Value	Change from previous day	Performance from initial value
0	100.00	-	-	100.00	-	-	100.00	-	-
1	99.00	-1.00%	-1.00%	96.00	-4.00%	-4.00%	92.00	-8.00%	-8.00%
2	98.00	-1.01%	-2.00%	92.12	-4.04%	-7.88%	84.57	-8.08%	-15.43%
3	97.00	-1.02%	-3.00%	88.36	-4.08%	-11.64%	77.67	-8.16%	-22.33%
4	96.00	-1.03%	-4.00%	84.72	-4.12%	-15.28%	71.27	-8.24%	-28.73%
5	95.00	-1.04%	-5.00%	81.19	-4.17%	-18.81%	65.34	-8.32%	-34.66%



4x Short Factor Certificate			8x Short Factor Certificate		
Value	Change from previous day	Performance from initial value	Value	Change from previous day	Performance from initial value
100.00	-	-	100.00	-	-
104.00	4.00%	4.00%	108.00	8.00%	8.00%
108.20	4.04%	8.20%	116.73	8.08%	16.73%
112.62	4.08%	12.62%	126.25	8.16%	26.25%
117.26	4.12%	17.26%	136.65	8.24%	36.65%
122.13	4.16%	22.13%	148.02	8.32%	48.02%

Scenario 3: Sideways movement with no clear price trend

In scenario 3, Sample AG shares start at CHF 100 but fluctuate around the initial price over the following days with no apparent trend. Profits and losses also alternate daily. Both Long and Short Factor Certificates alternately make gains and losses.

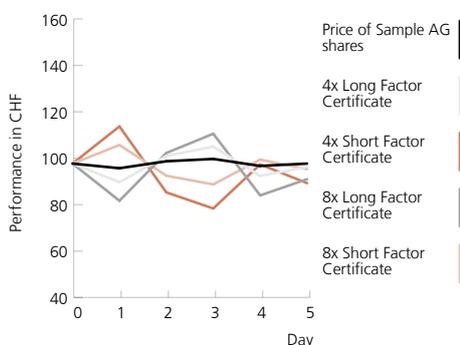
The base effect in this instance is negative, because after each incurred loss a larger percentage gain in the underlying is needed to catch up again. If a Factor Certificate has lost 50%, a 100% price increase is needed to get back to the starting level.

The performance of the Factor Certificates in the table clearly shows the negative base effect. A sideways movement in the underlying can lead to losses in just a few days. Even though the Sample AG shares end the period where they started, both Long and Short Factor Certificates show losses.

In a sideways phase, the greater the fluctuations in the underlying and the higher the factor, the greater the potential losses. In the worst-case scenario, a total loss is possible.

Tab. 3: Share price moves sideways

Performance of Sample AG shares				4x Long Factor Certificate			8x Long Factor Certificate		
Day	Price of Sample AG shares in CHF	Change from previous day	Performance from initial value	Value	Change from previous day	Performance from initial value	Value	Change from previous day	Performance from initial value
0	100.00	-	-	100.00	-	-	100.00	-	-
1	98.00	-2.00%	-2.00%	92.00	-8.00%	-8.00%	84.00	-16.00%	-16.00%
2	101.00	3.06%	1.00%	103.26	12.24%	3.26%	104.56	24.48%	4.56%
3	102.00	0.99%	2.00%	107.35	3.96%	7.35%	112.84	7.92%	12.84%
4	99.00	-2.94%	-1.00%	94.73	-11.76%	-5.27%	86.30	-23.52%	-13.70%
5	100.00	1.01%	0.00%	98.55	4.04%	-1.45%	93.28	8.08%	-6.72%



4x Short Factor Certificate			8x Short Factor Certificate		
Value	Change from previous day	Performance from initial value	Value	Change from previous day	Performance from initial value
100.00	-	-	100.00	-	-
108.00	8.00%	8.00%	116.00	16.00%	16.00%
94.78	-12.24%	-5.22%	87.60	-24.48%	-12.40%
91.03	-3.96%	-8.97%	80.67	-7.92%	-19.33%
101.73	11.76%	1.73%	99.64	23.52%	-0.36%
97.62	-4.04%	-2.38%	91.59	-8.08%	-8.41%

Opportunities and risks

- Opportunities**
- Participation in the underlying with constant leverage: the factor remains the same due to daily adjustment to the product parameters
 - Higher effective leverage when trends are clear than with traditional leveraged products, due to the base effect
 - No term limitation (open end)
 - No (direct) impact on pricing from volatility
 - Reset mechanism significantly reduces the probability of a knock-out event
 - Easy to find a product, as a Factor Certificate offers the same leverage every day

- Risks**
- Disproportionate losses, even total loss, if the underlying moves in the wrong direction
 - Losses, even total loss, if the underlying moves sideways for an extended period, due to path dependency
 - The higher the factor, the greater the probability of loss if the underlying moves in the wrong direction
 - Path dependency means that forecasts of how a Factor Certificate will perform assuming certain prices for the underlying are not really possible
 - Negative base effect when the underlying moves sideways, due to path dependency
 - No capital protection: investors risk losing their investment if the price of the underlying falls
 - The issuer intends to provide daily liquidity in normal market phases. However, investors should note that it may not always be possible to sell certificates
 - Certificates where the underlying is quoted in another currency are exposed to exchange rate risk
 - The investor is exposed to issuer risk and thus the risk of losing their invested capital if the issuer becomes insolvent
 - The issuer is entitled to terminate the product under certain circumstances.

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