FX Option Solutions

FX Hedging & Investments
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1. Liability side
Case Study I – FX Hedging
Long EUR/USD position

For illustration purposes, the strategies presented in the first part of this book follow these assumptions:

- Customer has a **Long position in EUR against USD**
- Customer needs hedging for a tenor of three months
- Reference spot rate is at 1.3000 (spot)
- Reference outright forward is at 1.2925 (Forward)

### Strategy summary

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Upside participation</th>
<th>Downside participation</th>
<th>Premium</th>
<th>Guaranteed rate</th>
<th>Best case rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward</td>
<td>None</td>
<td>None</td>
<td>No</td>
<td>1.2925</td>
<td>n.a.</td>
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<td>No</td>
<td>1.2650</td>
<td>1.3200</td>
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<tr>
<td>Participating Forward</td>
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<td>No</td>
<td>1.2710</td>
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<tr>
<td>Cylinder Extra</td>
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<td>1.2725</td>
<td>1.3675</td>
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<tr>
<td>Forward Extra</td>
<td>Limited</td>
<td>None</td>
<td>No</td>
<td>1.2825</td>
<td>1.3775</td>
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<tr>
<td>European Forward Extra</td>
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<td>No</td>
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<td>1.3475</td>
</tr>
<tr>
<td>Inverse Forward Extra</td>
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<td>Limited</td>
<td>No</td>
<td>1.2825</td>
<td>1.3750</td>
</tr>
<tr>
<td>Forward Plus</td>
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<td>No</td>
<td>1.2775</td>
<td>1.3675</td>
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<tr>
<td>Extra Forward Extra</td>
<td>Limited</td>
<td>Limited</td>
<td>No</td>
<td>1.2775</td>
<td>1.3675</td>
</tr>
<tr>
<td>Knock-Out Forward</td>
<td>100% if barrier hit</td>
<td>None</td>
<td>No</td>
<td>1.2735</td>
<td>open if…</td>
</tr>
<tr>
<td>Contingent Forward</td>
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<td>No</td>
<td>1.2825</td>
<td>1.3825</td>
</tr>
<tr>
<td>Inverse Cylinder</td>
<td>None</td>
<td>Limited</td>
<td>No</td>
<td>1.2650</td>
<td>1.3200</td>
</tr>
<tr>
<td>Seagull</td>
<td>100%</td>
<td>None</td>
<td>No</td>
<td>1.2300</td>
<td>open</td>
</tr>
<tr>
<td>Bonus European Forward Extra</td>
<td>Limited</td>
<td>None</td>
<td>No</td>
<td>1.2600</td>
<td>1.3775</td>
</tr>
</tbody>
</table>
Forward
Low risk, 100% Hedge, no upside participation

- A Forward contract is a deal to exchange currencies at an agreed date in the future, at a pre-determined exchange rate set at inception. Entering into a Forward is the most standard and basic strategy for the customer to fully hedge the position against currency risk.

- With a Forward Contract, customer agrees to sell its EUR at the Outright Forward Rate of 1.2925, which provides full protection against the depreciation of the spot rate, but will not be able to benefit should the spot rate EUR/USD appreciate.

- Forward rates are determined on the basis of the spot rate, adjusted for the interest rate differential between the currencies.

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**Graphical overview**

**Realized rate**

- **Underlying spot**
  - **Opportunity profit**
  - **Opportunity loss**

- **Spot at expiry**
  - **Below 1.2925**
  - **Above 1.2925**

<table>
<thead>
<tr>
<th>Spot at expiry</th>
<th>Below 1.2925</th>
<th>Above 1.2925</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2100</td>
<td>1.3950</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2925</td>
<td>1.2925</td>
</tr>
</tbody>
</table>

**Pros**

- Provides full protection against a depreciation of the EUR/USD rate
- No premium

**Cons**

- Customer is unable to benefit from appreciation of the EUR/USD rate above 1.2925
**Put Option**

Low risk, 100% Hedge, full upside participation

- A plain vanilla Put Option on the EUR gives the customer the right, but not the obligation, to sell the EUR against USD at a fixed rate on expiration of the option
- A premium for the option is paid upfront and the option is exercised when the spot rate is below the fixed rate ('strike price') at expiry
- For a premium of USD 0.0320 per EUR, customer has the right to sell the EUR at 1.2925, while retaining the possibility of selling at more favourable rates in case of EUR/USD appreciation
- The premium is determined by the following factors: current forward rate, strike price, tenor, volatility and interest rates of the underlying currencies

### Graphical overview

![Graphical overview of Put Option](image)

### Spot at expiry

<table>
<thead>
<tr>
<th></th>
<th>Below 1.2925</th>
<th>Above 1.2925</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot (EUR/USD)</td>
<td>1.2305</td>
<td>1.3745</td>
</tr>
<tr>
<td>Outcome</td>
<td>Option exercised</td>
<td>Sell EUR at market rate</td>
</tr>
<tr>
<td>Realized rate¹</td>
<td>1.2605</td>
<td>1.3425</td>
</tr>
</tbody>
</table>

### Pros

- Provides full protection against a depreciation of the EUR/USD rate
- Compared to the Forward, customer is able to sell EUR at a more favourable rate if the spot at expiry is above 1.3245

### Cons

- Premium required to be paid upfront
- Due to the premium, customer realizes a rate less favourable than the Forward if the spot at expiry is below 1.3245

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1. Realized Rate accounts for the premium paid upfront
Cylinder
Low risk, 100% Hedge, limited upside participation

- A Cylinder is a zero cost strategy and provides a minimum and a maximum realizable rate for the EUR against the USD. It provides full protection against the depreciation of the spot and involves the purchase of a Put option and the sale of a Call option for the same amount. The premium raised by the sale of the Call matches the cost of the purchased Put Option.
- Customer buys a Put option on the EUR at a strike of 1.2650 and sells a Call option on the EUR at a strike of 1.3200, thus being assured of a minimum and maximum selling price for the EUR against USD.

**Graphical overview**

**Spot at expiry**

<table>
<thead>
<tr>
<th></th>
<th>Below 1.2650</th>
<th>Between 1.2650 and 1.3200</th>
<th>Above 1.3200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2400</td>
<td>1.3100</td>
<td>1.3500</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2650</td>
<td>1.3100</td>
<td>1.3200</td>
</tr>
</tbody>
</table>

**Pros**
- Provides full protection against a depreciation of the EUR/USD rate
- Net zero premium strategy
- Compared to a Forward, customer is able to sell the EUR at a higher rate if the spot at expiry is above 1.2925

**Cons**
- Customer is unable to benefit from the appreciation of the EUR/USD rate above 1.3200
- Customer is hedged at a guaranteed rate which is lower than the Forward
Participating Forward
Low risk, 100% Hedge, 50% upside participation

- A Participating Forward is a zero-cost strategy and provides full protection against the depreciation of the spot rate while allowing the customer to partially benefit from an unlimited appreciation of the underlying spot rate.

- It involves buying a Put option on the EUR for 100% of the hedge amount and selling a Call option on the EUR for 50% of the hedge amount, both at a strike of 1.2710. Therefore if the EUR/USD appreciates, customer may secure a better rate for the ‘open part’ of the hedge amount (50%) by selling the EUR at the spot market.

- By entering into a Participating Forward, customer is guaranteed a minimum rate of 1.2710 and participates in EUR/USD appreciation above that level.

**Graphical overview**

- **Realized rate**
- **Underlying spot**
- **Spot at expiry**
  - Below 1.2710
  - Above 1.2710
  - **Spot**
    - 1.2450
    - 1.3600
  - **Outcome**
    - Put option is exercised
    - Sell 50% at spot
    - Sell 50% at 1.2710
  - **Realized rate**
    - 1.2710
    - 1.3155

**Pros**

- Provides full protection against a depreciation of EUR/USD rate
- Net zero premium strategy
- Compared to a Forward, customer is able to sell the EUR at a higher average rate if the spot at expiry is above 1.3140
- 50% participation in unlimited appreciation of the spot

**Cons**

- Customer is hedged at a guaranteed rate which is lower than the Forward

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**ING**

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Cylinder Extra
Low risk, 100% Hedge, Limited upside participation

- Similar to a Cylinder, the Cylinder Extra is a zero cost strategy and provides a minimum and maximum realizable rate for the EUR against USD. The difference in a Cylinder Extra is that customer can achieve a higher maximum realizable rate compared to the Cylinder, but customer also has a chance to end at a lower realizable rate compared to the Cylinder.

- Customer is (a) guaranteed a minimum rate of 1.2725, (b) may fully benefit from the appreciation of EUR/USD as long as the spot does not trade at or above 1.3675, and (c) has a potential obligation to sell the EUR at 1.3025 if the EUR/USD spot rate appreciates to or above 1.3675.

Graphical overview

Spot at expiry

<table>
<thead>
<tr>
<th></th>
<th>Below 1.2725</th>
<th>Between 1.2725 and 1.3675</th>
<th>Between 1.2725 and 1.3675</th>
<th>Above 1.3675</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2400</td>
<td>1.3600</td>
<td>1.3600</td>
<td>1.4125</td>
</tr>
<tr>
<td>Highest spot</td>
<td>n.a.</td>
<td>&lt;1.3675</td>
<td>≥1.3675</td>
<td>n.a.</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2725</td>
<td>1.3600</td>
<td>1.3025</td>
<td>1.3025</td>
</tr>
</tbody>
</table>

Pros
- Provides full protection against the depreciation of EUR/USD rate.
- Net zero premium strategy.
- Higher maximum rate possible compared to Cylinder.
- Higher guaranteed rate compared to Cylinder.

Cons
- Customer is hedged at a guaranteed rate which is lower than the Forward.
- Customer is unable to benefit from appreciation of the EUR/USD above 1.3675.
**Forward Extra**

**Low risk, 100% Hedge, Limited upside participation**

- A Forward Extra is a zero-cost strategy and provides full protection against the depreciation of the spot rate EUR/USD, while at the same time allowing the customer to benefit from the appreciation of the spot rate up to a pre-determined barrier level.
- Customer is (a) guaranteed a minimum rate of 1.2825, and (b) is able to benefit from EUR/USD appreciation up to 1.3775.
- If the EUR/USD spot rate trades at or above 1.3775 at any time during the tenor, customer will be required to sell the EUR at 1.2825 regardless of where the spot is at expiry.

**Graphical overview**

<table>
<thead>
<tr>
<th>Realized rate</th>
<th>Spot at expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below 1.2825</td>
</tr>
<tr>
<td>Spot</td>
<td>1.2400</td>
</tr>
<tr>
<td>Highest spot</td>
<td>n.a.</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2825</td>
</tr>
</tbody>
</table>

**Pros**

- Provides full protection against a depreciation of the EUR/USD rate.
- Net zero premium strategy.
- If the spot appreciates but does not trade at or above 1.3775, customer may sell the EUR at a rate which is higher than the Forward.

**Cons**

- Customer is hedged at a guaranteed rate which is lower than the Forward.
- If the spot trades at or above 1.3775, customer is obliged to sell EUR at 1.2825.
- Barrier level 1.3775 is applicable at any time during the tenor.
European Forward Extra
Low risk, 100% Hedge, limited upside participation

- A European Forward Extra is a zero-cost strategy and provides full protection against the depreciation of the spot rate EUR/USD, while at the same time allowing the customer to benefit from the appreciation of the spot rate up to a predetermined barrier level.
- Customer is (a) guaranteed a minimum rate of 1.2825, and (b) benefits if EUR/USD appreciates up to 1.3475 at expiry.
- If the EUR/USD spot rate trades at or above 1.3475 at expiry, customer will be required to sell the EUR at 1.2825.

### Graphical overview

#### Realized rate

- **Spot at expiry**

<table>
<thead>
<tr>
<th></th>
<th>Below 1.2825</th>
<th>Between 1.2825 and 1.3475</th>
<th>At or Above 1.3475</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2400</td>
<td>1.3200</td>
<td>1.3500</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2825</td>
<td>1.3200</td>
<td>1.2825</td>
</tr>
</tbody>
</table>

### Pros
- Provides full protection against a depreciation of EUR/USD.
- Net zero premium strategy.
- If the spot appreciates but does not trade at or above the barrier 1.3475 at expiry, customer may sell the EUR at a rate which is higher than the Forward.
- Barrier level is only applicable at expiry.

### Cons
- Customer is hedged at a guaranteed rate which is lower than the Forward.
- If the spot at expiry trades at or above 1.3475, customer is obliged to sell EUR at 1.2825.
- As compared to the Forward Extra, the potential maximum rate is lower.
**Inverse Forward Extra**

*Low risk, 100% Hedge, limited downside participation*

- An Inverse Forward Extra is a zero-cost strategy and provides full protection against a depreciation of the spot rate EUR/USD, while at the same time allowing the customer to benefit from a depreciation of the spot rate down to a pre-determined barrier level.
- Customer is (a) guaranteed a minimum rate of 1.2825 (= Inverse Forward Extra Level), and (b) is able to benefit from EUR/USD depreciation down to 1.1900, the barrier level.
- Customer is able to benefit from EUR/USD depreciation down from 1.2825 to 1.1900: Inverse Forward Extra Level + (Inverse Forward Extra Level - Final spot).

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**Graphical overview**

<table>
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<tr>
<th>Realized rate</th>
<th>Spot expiry</th>
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<th>Between 1.1900 and 1.2825</th>
<th>Between 1.1900 and 1.2825</th>
<th>Above 1.2825</th>
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<td>1.1950</td>
<td>1.3950</td>
<td></td>
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<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td></td>
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<tr>
<td>Realized rate</td>
<td>1.2825</td>
<td>1.2825</td>
<td>1.3700</td>
<td>1.2825</td>
<td></td>
</tr>
</tbody>
</table>

**Pros**
- Provides full protection against a depreciation of EUR/USD.
- Net zero premium strategy.
- If the spot depreciates but does not trade at or below 1.1900, customer will sell the EUR at a rate which is higher than the Forward.

**Cons**
- Customer is hedged at a guaranteed rate which is lower than the Forward.
- If the spot trades at or below 1.1900, customer is obliged to sell EUR at 1.2825.
- Barrier level 1.1900 is applicable at anytime during the tenor.
**Forward Plus**
Low risk, 100% Hedge, limited upside participation

- A Forward Plus is a zero-cost strategy and provides full protection against a depreciation of the spot rate EUR/USD, while at the same time allowing the customer to benefit from the appreciation of the spot rate up to a pre-determined barrier level.
- Customer is (a) guaranteed a minimum rate of 1.2775, and (b) able to benefit from EUR/USD appreciation up to 1.3675.
- If the EUR/USD spot rate trades at or above 1.3675, at any time during the tenor, customer will be required to sell the EUR at 1.2925, which is equal to the Forward.

### Graphical overview

#### Spot at expiry

<table>
<thead>
<tr>
<th></th>
<th>Below 1.2775</th>
<th>Below 1.2775 and 1.3675</th>
<th>Between 1.2775 and 1.3675</th>
<th>Above 1.3675</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2525</td>
<td>1.2525</td>
<td>1.3450</td>
<td>1.3450</td>
</tr>
<tr>
<td>Highest spot</td>
<td>&lt;1.3675</td>
<td>≥1.3675</td>
<td>&lt;1.3675</td>
<td>≥1.3675</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2775</td>
<td>1.2925</td>
<td>1.3450</td>
<td>1.2925</td>
</tr>
</tbody>
</table>

#### Pros
- Provides full protection against a depreciation of the EUR/USD rate.
- Net zero premium strategy.
- If the spot appreciates but does not trade at or above 1.3675, customer may sell the EUR at a rate which is higher than the Forward.

#### Cons
- Customer is hedged at a guaranteed rate which is lower than the Forward.
- If the spot trades at or above 1.3675, customer is obliged to sell EUR at 1.2925.
- Barrier level 1.3675 is applicable at any time during the tenor.
Extra Forward Extra
Low risk, 100% Hedge, limited downside and limited upside participation

- An Extra Forward Extra is a zero-cost strategy and provides full protection against a depreciation of the rate EUR/USD, while at the same time allowing the customer to benefit from both the appreciation and depreciation of the spot rate, both to a pre-determined barrier level
- Customer is (a) guaranteed a minimum rate of 1.2775 (‘Extra Forward Extra Level’), and (b) is able to benefit from:
  - EUR/USD appreciation: up to 1.3675; computed as follows: Extra Forward Extra Level + (Final spot – Extra Forward Extra Level)
  - EUR/USD depreciation: down to 1.1875; computed as follows: Extra Forward Extra Level + (Extra Forward Extra Level - Final spot)

Graphical overview

<table>
<thead>
<tr>
<th>Realized rate</th>
<th>Spot at expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below 1.2775</td>
</tr>
<tr>
<td>Spot</td>
<td>1.2100</td>
</tr>
<tr>
<td>Lowest spot</td>
<td>≤1.1875</td>
</tr>
<tr>
<td>Highest spot</td>
<td>n.a.</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2775</td>
</tr>
</tbody>
</table>

Pros
- Provides full protection against a depreciation of EUR/USD
- Net zero premium strategy
- If the spot appreciates but does not trade at or above 1.3675, or if the spot depreciates but does not trade at or below 1.1875, customer may sell the EUR at a rate which is higher than the Forward

Cons
- Customer is hedged at a guaranteed rate which is lower than the Forward
- If the spot trades at or beyond both barrier levels customer will not be able to benefit and is obliged to sell EUR at 1.2775
- Barrier levels 1.1875 and 1.3675 are applicable at any time during the tenor
Knock-Out Forward
Low risk, 100% Hedge, with possible full upside participation

- The Knock-Out Forward is a zero cost strategy and provides full protection against a depreciation of the spot rate EUR/USD. At the same time the customer will be able to benefit from an appreciation of the spot rate if this spot rate hits a barrier level at any time during the tenor of the strategy.
- Customer is guaranteed a minimum rate of 1.2735, regardless of whether the spot does or does not hit the barrier level.
- If the EUR/USD spot rate trades at any time during the tenor at or below 1.2735 (barrier level) customer will be able to fully benefit from EUR/USD appreciation up from 1.2735.

Graphical overview

Spot at expiry

<table>
<thead>
<tr>
<th>Spot at Expiry</th>
<th>Below 1.2735</th>
<th>Above 1.2735</th>
<th>Above 1.2735</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2600</td>
<td>1.3200</td>
<td>1.3200</td>
</tr>
<tr>
<td>Barrier hit</td>
<td>n.a.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2735</td>
<td>1.3200</td>
<td>1.2735</td>
</tr>
</tbody>
</table>

Pros
- Provides full protection against a depreciation of the EUR/USD rate.
- Net zero premium strategy.
- If the spot does trade at or below 1.2735 and appreciates afterwards, customer may sell the EUR at a rate which is higher than the Forward.
- Barrier level 1.2735 is applicable at any time during the tenor.

Cons
- Customer is hedged at a guaranteed rate which is lower than the Forward.
- If the spot does not trade at or below 1.2735, customer will not be able to benefit from a appreciation of the spot.
Contingent Forward
Low risk, 100% Hedge, limited upside participation

- The Contingent Forward is a zero cost strategy and provides full protection against a depreciation of the spot rate EUR/USD. At the same time the customer will be able to benefit from the appreciation of the spot rate up to a pre-determined level.
- Customer is (a) guaranteed a minimum rate of 1.2825 and (b) is able to profit to benefit from EUR/USD appreciation up to 1.3825.
- If the EUR/USD spot trades at or above 1.3825 or at or below 1.2825 at any time during the tenor, customer will be required to sell the EUR at 1.2825, regardless where the spot is at expiry.

Graphical overview

Spot at expiry

<table>
<thead>
<tr>
<th></th>
<th>Below 1.2825</th>
<th>Above 1.3825</th>
<th>Above 1.3825</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2400</td>
<td>1.3800</td>
<td>1.3800</td>
</tr>
<tr>
<td>Barrier(s) hit</td>
<td>n.a.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2825</td>
<td>1.2825</td>
<td>1.3800</td>
</tr>
</tbody>
</table>

Pros
- Provides full protection against a depreciation of the EUR/USD rate.
- Net zero premium strategy.
- If the EUR/USD appreciates but does not trade at or above 1.3825 or at or below 1.2825, customer may sell the EUR at a rate which is higher than the Forward.

Cons
- Customer is hedged at a guaranteed rate which is lower than the Forward.
- If the spot trades at or beyond one of the barriers, customer is obliged to sell EUR at 1.2825.
- Barrier levels are applicable at any time during the tenor.
Inverse Cylinder
Low risk, 100% Hedge, limited downside participation

- An Inverse Cylinder is a zero cost strategy and provides a minimum and a maximum realizable rate for the EUR against the USD. It gives the opportunity to profit from a depreciation until a pre-determined level and provides protection to a further depreciation.

- It involves the purchase of an In-The-Money Put option and the sale of an In-The-Money Call option for the same amount. The premium raised by the sale of the Call matches the cost of the purchased Put Option.

- Customer buys a Put option on the EUR with a strike of 1.3200 and sells a Call option on the EUR with a strike of 1.2650, thus being assured of a minimum and maximum selling price for the EUR against USD.

**Graphical overview**

<table>
<thead>
<tr>
<th>Realized rate</th>
<th>Inverse Cylinder</th>
<th>Forward</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2925</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2650</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Spot at expiry**

<table>
<thead>
<tr>
<th></th>
<th>Below 1.2650</th>
<th>Between 1.2650 and 1.3200</th>
<th>Above 1.3200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2400</td>
<td>1.2925</td>
<td>1.3500</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.3200</td>
<td>1.2925</td>
<td>1.2650</td>
</tr>
</tbody>
</table>

**Pros**
- Provides full protection against a depreciation of the EUR/USD rate
- Net zero premium strategy
- Compared to a Forward, customer is able to sell the EUR at a higher rate if the spot at expiry is below 1.2925

**Cons**
- Customer is only able to benefit from a depreciation in EUR/USD; the effective rate falls if EUR/USD appreciates
- Customer is hedged at a guaranteed rate which is lower than the Forward
Seagull
Low risk, 100% Hedge, upside participation

- A Seagull is a zero-cost strategy and provides full protection against the depreciation of the EUR/USD exchange rate, while at the same time allowing the customer to benefit from an appreciation of the spot rate until and above a pre-determined level.

- Customer buys a put option on the EUR at a strike of 1.2300, sells a call option on the EUR at a strike of 1.3100, and buys a call option on the EUR at a strike of 1.3900.

- Customer is (a) guaranteed a minimum rate of 1.2300 (Put level), (b) is able to benefit from EUR/USD appreciation until 1.3100 and (c) is able to benefit from EUR/USD appreciation above 1.3900, with a realized rate computed as follows: Spot at expiry - (1.3900 - 1.3100).

Graphical overview

<table>
<thead>
<tr>
<th>Realized rate</th>
<th>1.2300</th>
<th>1.3100</th>
<th>1.3900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot at expiry</td>
<td>1.2000</td>
<td>1.2700</td>
<td>1.3500</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2300</td>
<td>1.2700</td>
<td>1.3100</td>
</tr>
</tbody>
</table>

Pros
- Provides full protection against a depreciation of the EUR/USD rate.
- Net zero premium strategy.
- Opportunity to benefit from an appreciation of EUR/USD until 1.3100.
- Opportunity to benefit from an appreciation of EUR/USD above 1.3900.

Cons
- Customer is hedged at a guaranteed rate which is lower than the Forward.
- If the spot trades between 1.3100 and 1.3900, the customer has to sell EUR at 1.3100.
- The realized rate if spot trades above 1.3900 will be lower than the market rate.
**Bonus European Forward Extra**

**Low risk, 100% Hedge, upside participation**

- A Bonus European Forward Extra is a zero-cost strategy appropriate for downside protection combined with a bearish view on EUR/USD.

- The strategy provides full protection against depreciation of the EUR/USD exchange rate while at the same time allowing the customer to benefit from an appreciation of the rate until a pre-determined level.

- In addition, if a barrier on the downside gets hit at any time during the tenor, the customer receives a ‘bonus’. The bonus level can be chosen freely and will impact the worst and best case rate. The lower the barrier, the higher the bonus (ceteris paribus).

- Customer is (a) guaranteed a minimum rate of 1.2600, (b) is able to benefit from EUR/USD appreciation up to 1.3325, and (c) will receive a ‘bonus’ of USD 0.0450 if EUR/USD trades below 1.1900 at any moment during the full tenor.

### Graphical overview

- Provides full protection against a depreciation of the EUR/USD rate.
- Net zero premium strategy.
- If spot appreciates but does not trade at or above 1.3325 at expiry, customer may sell the EUR at the market rate.
- Customer receives ‘bonus’ if EUR/USD hits 1.1900 during the tenor.

### Spot at expiry

<table>
<thead>
<tr>
<th></th>
<th>Below 1.1900</th>
<th>Between 1.1900 &amp; 1.2600</th>
<th>Between 1.2600 &amp; 1.3325</th>
<th>Above 1.3325</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spot</strong></td>
<td>1.1750</td>
<td>1.2300</td>
<td>1.2850</td>
<td>1.3600</td>
</tr>
<tr>
<td><strong>Lowest Spot</strong></td>
<td>n/a</td>
<td>&lt;=1.1900</td>
<td>&gt;1.1900</td>
<td>&lt;=1.1900</td>
</tr>
<tr>
<td><strong>Realized Rate</strong></td>
<td>1.3050</td>
<td>1.3050</td>
<td>1.2600</td>
<td>1.3050</td>
</tr>
</tbody>
</table>

### Pros

- Provides full protection against a depreciation of the EUR/USD rate.
- Net zero premium strategy.
- If spot appreciates but does not trade at or above 1.3325 at expiry, customer may sell the EUR at the market rate.
- Customer receives ‘bonus’ if EUR/USD hits 1.1900 during the tenor.

### Cons

- If EUR/USD does not hit 1.1900 during the tenor, customer is hedged at a guaranteed rate which is lower than the Forward.
- If spot at expiry trades at or above 1.3325, customer is obliged to sell EUR at 1.2600 or 1.3050, depending on the barrier being hit or not.
1. Liability side
Case Study II – FX Hedging
Short EUR/USD position

For illustration purposes, the strategies presented in the second part of this book follow these assumptions:

- Customer has a **Short position in EUR against USD**
- Customer needs hedging for a tenor of three months
- Reference spot rate is at 1.3000 (spot)
- Reference outright forward is at 1.2925 (Forward)

### Strategy summary

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Downside participation</th>
<th>Upside participation</th>
<th>Premium</th>
<th>Best case rate</th>
<th>Guaranteed rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward</td>
<td>None</td>
<td>None</td>
<td>No</td>
<td>n.a.</td>
<td>1.2925</td>
</tr>
<tr>
<td>Call</td>
<td>100%</td>
<td>None</td>
<td>Yes</td>
<td>open</td>
<td>1.3245</td>
</tr>
<tr>
<td>Cylinder</td>
<td>Limited</td>
<td>None</td>
<td>No</td>
<td>1.2650</td>
<td>1.3200</td>
</tr>
<tr>
<td>Participating Forward</td>
<td>50%</td>
<td>None</td>
<td>No</td>
<td>open</td>
<td>1.3140</td>
</tr>
<tr>
<td>Cylinder Extra</td>
<td>Limited</td>
<td>None</td>
<td>No</td>
<td>1.2175</td>
<td>1.3125</td>
</tr>
<tr>
<td>Forward Extra</td>
<td>Limited</td>
<td>None</td>
<td>No</td>
<td>1.2075</td>
<td>1.3025</td>
</tr>
<tr>
<td>European Forward Extra</td>
<td>Limited</td>
<td>None</td>
<td>No</td>
<td>1.2375</td>
<td>1.3025</td>
</tr>
<tr>
<td>Inverse Forward Extra</td>
<td>None</td>
<td>Limited</td>
<td>No</td>
<td>1.2100</td>
<td>1.3025</td>
</tr>
<tr>
<td>Forward Plus</td>
<td>Limited</td>
<td>None</td>
<td>No</td>
<td>1.2175</td>
<td>1.3075</td>
</tr>
<tr>
<td>Extra Forward Extra</td>
<td>Limited</td>
<td>Limited</td>
<td>No</td>
<td>1.2350</td>
<td>1.3075</td>
</tr>
<tr>
<td>Knock-Out Forward</td>
<td>100% trigger hit</td>
<td>None</td>
<td>No</td>
<td>open if…</td>
<td>1.3115</td>
</tr>
<tr>
<td>Contingent Forward</td>
<td>Limited</td>
<td>None</td>
<td>No</td>
<td>1.2025</td>
<td>1.3025</td>
</tr>
<tr>
<td>Inverse Cylinder</td>
<td>None</td>
<td>Limited</td>
<td>No</td>
<td>1.2650</td>
<td>1.3200</td>
</tr>
<tr>
<td>Seagull</td>
<td>100%</td>
<td>None</td>
<td>No</td>
<td>Open</td>
<td>1.3700</td>
</tr>
<tr>
<td>Bonus European Forward Extra</td>
<td>Limited</td>
<td>None</td>
<td>No</td>
<td>1.1950</td>
<td>1.3200</td>
</tr>
</tbody>
</table>
Forward
Low risk, 100% Hedge, no downside participation

- A Forward Contract is a deal to exchange currencies at an agreed date in the future, at a pre-determined exchange rate set at inception. Entering into a Forward is the most standard and basic strategy for the customer to fully hedge the position against currency risk.
- With a Forward Contract, customer agrees to buy its EUR at the Outright Forward Rate of 1.2925 which provides full protection against the appreciation of the spot rate, but will not be able to benefit should the EUR/USD depreciate.
- Forward rates are determined on the basis of the spot rate, adjusted for the interest rate differential between the currencies.

**Graphical overview**

**Spot at expiry**

<table>
<thead>
<tr>
<th></th>
<th>Below 1.2925</th>
<th>Above 1.2925</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2400</td>
<td>1.3400</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2925</td>
<td>1.2925</td>
</tr>
</tbody>
</table>

**Pros**

- Provides full protection against an appreciation of the EUR/USD rate
- No premium

**Cons**

- Customer is unable to benefit from depreciation of the EUR/USD rate below 1.2925
Call Option
Low risk, 100% Hedge, full downside participation

- A plain vanilla Call Option on the EUR gives the customer the right, but not the obligation, to buy the EUR against USD at a fixed rate on expiration of the option
- A premium for the option is paid upfront and the option is exercised when the spot is above the fixed rate (‘strike price’) at expiry
- For a premium of USD 0.0320 per EUR, customer has the right to buy the EUR at 1.2925, while retaining the possibility of buying at more favourable rates in case of EUR/USD depreciation
- This premium is determined by the following factors: current spot rate, strike price, tenor, volatility and interest rates of the underlying currencies

Graphical overview

Spot at expiry

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Below 1.2925</th>
<th>Above 1.2925</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2400</td>
<td>1.3400</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2720</td>
<td>1.3245</td>
</tr>
</tbody>
</table>

Pros
- Provides full protection against an appreciation of the EUR/USD rate
- Compared to the Forward, customer is able to buy EUR at a more favourable rate if the spot at expiry is below 1.2605

Cons
- Premium required to be paid upfront
- Due to the premium, customer realizes a rate less favourable than the Forward rate if the spot at expiry is above 1.2605

1. Realized Rate accounts for the premium paid upfront
Cylinder
Low risk, 100% Hedge, limited downside participation

A Cylinder is a zero cost strategy, and provides a maximum and a minimum realizable rate for the EUR against the USD. It provides full protection against the appreciation of the spot and involves the purchase of a Call and the sale of a Put for the same amount. The premium raised by the sale of the Put exactly matches the cost of a Call Option.

Customer buys a Call option on the EUR at a strike of 1.3200 and sells a Put option on the EUR at a strike of 1.2650, thus being assured of a maximum and minimum buying price for the EUR against the USD.

Graphical overview

<table>
<thead>
<tr>
<th>Spot at expiry</th>
<th>Below 1.2650</th>
<th>Between 1.2650 and 1.3200</th>
<th>Above 1.3200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2400</td>
<td>1.2800</td>
<td>1.3400</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2650</td>
<td>1.2800</td>
<td>1.3200</td>
</tr>
</tbody>
</table>

Pros
- Provides full protection against an appreciation of the EUR/USD rate
- Net zero premium strategy
- Compared to a Forward, customer is able to buy the EUR at a lower rate if the spot at expiry is below 1.2925

Cons
- Customer is unable to benefit from the depreciation of the EUR/USD rate below 1.2650
- Customer is hedged at a guaranteed rate which is higher than the Forward
Participating Forward
Low risk, 100% Hedge, 50% downside participation

- A Participating Forward is a zero-cost strategy and provides full protection against the appreciation of the spot rate while allowing the customer to partially benefit from an unlimited depreciation of the underlying spot rate.
- It involves buying a Call option on the EUR for 100% of the hedge amount and selling a Put option on the EUR for 50% of the hedge amount, both at the strike of 1.3140. Therefore if the EUR/USD depreciates, customer may secure a better rate for the 'open part' of the hedge amount (50%) by buying the EUR at the spot market.
- By entering into a Participating Forward, customer is guaranteed a maximum rate of 1.3140 and participates in EUR/USD depreciation below that level.

<table>
<thead>
<tr>
<th>Spot at expiry</th>
<th>Below 1.3140</th>
<th>Above 1.3140</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2280</td>
<td>1.3250</td>
</tr>
<tr>
<td>Outcome</td>
<td>Buy 50% at spot</td>
<td>Call Option is exercised</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2710</td>
<td>1.3140</td>
</tr>
</tbody>
</table>

**Pros**
- Provides full protection against an appreciation of the EUR/USD rate
- Net zero premium strategy
- Compared to a Forward, customer is able to buy the EUR at a lower average rate if the spot at expiry is below 1.2710
- 50% participation in unlimited depreciation of the spot

**Cons**
- Customer is hedged at a guaranteed rate which is higher than the Forward

---

**Graphical overview**

<table>
<thead>
<tr>
<th>Realized rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3140</td>
</tr>
<tr>
<td>1.2925</td>
</tr>
<tr>
<td>1.2710</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spot at expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2280</td>
</tr>
<tr>
<td>1.2710</td>
</tr>
<tr>
<td>1.3140</td>
</tr>
<tr>
<td>1.3250</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graphical overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realized rate</td>
</tr>
<tr>
<td>1.3140</td>
</tr>
<tr>
<td>1.2925</td>
</tr>
<tr>
<td>1.2710</td>
</tr>
</tbody>
</table>

**Outcome**
- Buy 50% at spot
- Call Option is exercised
Cylinder Extra
Low risk, 100% Hedge, limited downside participation

- Similar to a Cylinder, the Cylinder Extra is a zero cost strategy and provides a minimum and maximum realizable rate for the EUR against USD. The difference in a Cylinder Extra is that customer can achieve a lower minimum realizable rate compared to the cylinder, but customer also has a chance to end at a higher realizable rate compared to the Cylinder.

- Customer is (a) guaranteed a maximum rate of 1.3125 (b) may fully benefit from the depreciation of EUR/USD as long as the spot does not trade at or below 1.2175, and (c) has a potential obligation to buy the EUR at 1.2825 if the spot rate the EUR/USD depreciates to or below 1.2175.

### Graphical overview

<table>
<thead>
<tr>
<th>Realized rate</th>
<th>Spot at expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below 1.2175</td>
</tr>
<tr>
<td></td>
<td>Spot 1.2100</td>
</tr>
<tr>
<td></td>
<td>Lowest spot n.a.</td>
</tr>
<tr>
<td></td>
<td>Realized rate 1.2825</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spot at expiry</th>
<th>Realized rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2100</td>
<td>1.2825</td>
</tr>
<tr>
<td>1.2300</td>
<td>1.3125</td>
</tr>
</tbody>
</table>

### Pros
- Provides full protection against an appreciation of the EUR/USD rate
- Net zero premium strategy
- Lower minimum rate possible compared to Cylinder
- Lower guaranteed rate compared to Cylinder

### Cons
- Customer is hedged at a guaranteed rate which is higher than the Forward
- Customer is unable to benefit from depreciation of the EUR/USD below 1.2175
**Forward Extra**

*Low risk, 100% Hedge, limited downside participation*

- A Forward Extra is a zero-cost strategy and provides full protection against the appreciation of the spot rate, while at the same time allowing the customer to benefit from the depreciation of the spot rate down to a predetermined barrier level.
- Customer is (a) guaranteed a maximum rate of 1.3025, and (b) is able to benefit from EUR/USD depreciation down to 1.2075.
- If the EUR/USD spot rate trades at or below 1.2075 at any time during the tenor, customer will be required to buy the EUR at 1.3025 regardless of where the spot is at expiry.

**Graphical overview**

<table>
<thead>
<tr>
<th>Realized rate</th>
<th>Spot at expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below 1.2075</td>
</tr>
<tr>
<td>Spot</td>
<td>1.2020</td>
</tr>
<tr>
<td>Lowest spot</td>
<td>n.a.</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.3025</td>
</tr>
</tbody>
</table>

**Pros**
- Provides full protection against an appreciation of the EUR/USD rate.
- Net zero premium strategy.
- If the spot depreciates but does not trade at or below 1.2075, Customer may buy the EUR at a rate which is lower than the Forward.

**Cons**
- Customer is hedged at a guaranteed rate which is higher than the Forward.
- If the spot trades at or below 1.2075, customer is obliged to buy EUR at 1.3025.
- Barrier level 1.2075 is applicable at any time during the tenor.
European Forward Extra
Low risk, 100% Hedge, Limited downside participation

- A European Forward Extra is a zero-cost strategy and provides full protection against the appreciation of the spot rate EUR/USD, while at the same time allowing the customer to benefit from the depreciation of the spot rate down to a pre-determined barrier level.

- Customer is (a) guaranteed a maximum rate of 1.3025, and (b) benefits if EUR/USD depreciates down to 1.2375 at expiry

- If the EUR/USD spot rate trades at or below 1.2375 at expiry, customer is required to buy the EUR at 1.3025

**Graphical overview**

**Spot at expiry**

<table>
<thead>
<tr>
<th></th>
<th>At or below 1.2375</th>
<th>Between 1.2375 and 1.3025</th>
<th>Above 1.3025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2200</td>
<td>1.2450</td>
<td>1.3270</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.3025</td>
<td>1.2450</td>
<td>1.3025</td>
</tr>
</tbody>
</table>

**Pros**
- Provides full protection against the appreciation of the EUR/USD rate
- Net zero premium strategy
- If the spot depreciates but does not trade at or below 1.2375 at expiry, customer may buy the EUR at a rate which is lower than the Forward
- Barrier level is only applicable at expiry

**Cons**
- Customer is hedged at a guaranteed rate which is higher than the Forward
- If the spot at expiry trades at or below 1.2375, customer is obliged to buy the EUR at 1.3025
- As compared to the Forward Extra, the potential minimum rate is higher
In the Inverse Forward Extra, a customer is guaranteed a maximum rate of 1.3025 ('Inverse Forward Extra Level'), and is able to benefit from EUR/USD appreciation up to 1.3950, the barrier level. Customer is able to benefit from EUR/USD appreciation up from 1.3025 to 1.3950: Inverse Forward Extra Level - (Final spot - Inverse Forward Extra Level).

**Graphical overview**

**Spot at expiry**

<table>
<thead>
<tr>
<th>Below 1.3025</th>
<th>Between 1.3025 and 1.3950</th>
<th>Between 1.3025 and 1.3950</th>
<th>Above 1.3950</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest spot</td>
<td>n.a.</td>
<td>≥1.3950</td>
<td>&lt;1.3950</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.3025</td>
<td>1.3025</td>
<td>1.2250</td>
</tr>
</tbody>
</table>

**Pros**
- Provides full protection against an appreciation of the EUR/USD rate
- Net zero premium strategy
- If the spot appreciates but does not trade at or above 1.3950, customer may buy the EUR at a rate which is lower than the Forward

**Cons**
- Customer is hedged at a guaranteed rate which is higher than the Forward
- If the spot trades at or above 1.3950, customer is obliged to buy the EUR at 1.3025
- Barrier level 1.3950 is applicable at any time during the tenor
**Forward Plus**

Low risk, 100% Hedge, limited downside participation

- A Forward Plus is a zero-cost strategy and provides full protection against the appreciation of the spot rate EUR/USD, while at the same time allowing the customer to benefit from the depreciation of the spot rate, down to a pre-determined barrier level.
- Customer is (a) guaranteed a maximum rate of 1.3075 and (b) able to benefit from EUR/USD depreciation down to 1.2175.
- If the EUR/USD spot rate trades at or below 1.2175 at any time during the tenor, customer will be required to buy the EUR at 1.2925, which is equal to the Forward.

### Graphical overview

- **Realized rate**
  - Realized rate 1.2925
  - Realized rate 1.3075
  - Realized rate 1.2300

- **Underlying spot**
  - Underlying spot 1.2175
  - Underlying spot 1.2925
  - Underlying spot 1.3075

- **Barrier level**
  - Barrier is hit
  - Barrier is not hit

### Spot at expiry

<table>
<thead>
<tr>
<th>Spot at expiry</th>
<th>Below 1.2175</th>
<th>Between 1.2175 and 1.3075</th>
<th>Between 1.3075 and 1.3075</th>
<th>Above 1.3075</th>
<th>Above 1.3075</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2100</td>
<td>1.2300</td>
<td>1.2300</td>
<td>1.3250</td>
<td>1.3250</td>
</tr>
<tr>
<td>Lowest spot</td>
<td>n.a.</td>
<td>≤1.2175</td>
<td>&gt;1.2175</td>
<td>≤1.2175</td>
<td>&gt;1.2175</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.2925</td>
<td>1.2925</td>
<td>1.2925</td>
<td>1.2925</td>
<td>1.3075</td>
</tr>
</tbody>
</table>

### Pros

- Provides full protection against an appreciation of the EUR/USD rate.
- Net zero premium strategy.
- If the spot depreciates but does not trade at or below 1.2175, customer may buy the EUR at a rate which is lower than the Forward.

### Cons

- Customer is hedged at a guaranteed rate which is higher than the Forward.
- If the spot trades at or below 1.2175, customer is obliged to buy the EUR at 1.2925.
- Barrier level 1.2175, is applicable at any time during the tenor.
Extra Forward Extra
Low risk, 100% Hedge, limited downside and limited upside participation

- An Extra Forward Extra is a zero-cost strategy and provides full protection against the appreciation of the rate EUR/USD, while at the same time allowing the customer to benefit from both the appreciation and depreciation of the spot rate, both to a pre-determined barrier level
- Customer is (a) guaranteed a maximum rate of 1.3075 (‘Extra Forward Extra Level’), and (b) is able to benefit from:
  - EUR/USD depreciation: down to 1.2350; computed as follows: Extra Forward Extra Level – (Extra Forward Extra Level – Final spot)
  - EUR/USD appreciation; up to 1.3800; computed as follows: Extra Forward Extra Level – (Final spot -Extra Forward Extra Level)

Graphical overview

<table>
<thead>
<tr>
<th>Spot at expiry</th>
<th>Below</th>
<th>Below</th>
<th>Above</th>
<th>Above</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.3075</td>
<td>1.3075</td>
<td>1.3075</td>
<td>1.3075</td>
</tr>
<tr>
<td>Spot</td>
<td>1.2500</td>
<td>1.2500</td>
<td>1.3700</td>
<td>1.3700</td>
</tr>
<tr>
<td>Lowest spot</td>
<td>≤1.2350</td>
<td>&gt;1.2350</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Highest spot</td>
<td>n.a.</td>
<td>n.a.</td>
<td>&lt;1.3800</td>
<td>≥1.3800</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.3075</td>
<td>1.2500</td>
<td>1.2450</td>
<td>1.3075</td>
</tr>
</tbody>
</table>

Pros
- Provides full protection against an appreciation of the EUR/USD rate
- Net zero premium strategy
- If the spot depreciates but does not trade at or below 1.2350, or if the spot appreciates but does not trade at or above 1.3800, customer may buy the EUR at a rate which is lower than the Forward

Cons
- Customer is hedged at a guaranteed rate which is higher than the Forward
- If the spot trades at or beyond both barrier levels customer will not be able to benefit and is obliged to buy the EUR at 1.3075
- Barrier levels 1.2350 and 1.3800 are applicable at any time during the tenor
**Knock-Out Forward**

**Low risk, 100% Hedge, with possible full downside participation**

- The Knock-Out Forward is a zero cost strategy and provides full protection against the appreciation of the spot rate EUR/USD. At the same time the customer will be able to benefit from a depreciation of the spot rate if this spot rate hits a barrier level at any time during the tenor of the strategy.
- Customer is guaranteed a maximum rate of 1.3115, regardless of whether the spot does or does not hit the barrier level.
- If the EUR/USD spot rate trades at any time during the tenor at or above 1.3115 (barrier level), customer will be able to fully benefit from EUR/USD depreciation down from 1.3115.

### Graphical overview

#### Spot at expiry

<table>
<thead>
<tr>
<th></th>
<th>Below 1.3115</th>
<th>Below 1.3115</th>
<th>Above 1.3115</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2000</td>
<td>1.2000</td>
<td>1.3800</td>
</tr>
<tr>
<td>Trigger level hit</td>
<td>No</td>
<td>Yes</td>
<td>n.a.</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.3115</td>
<td>1.2000</td>
<td>1.3115</td>
</tr>
</tbody>
</table>

#### Pros
- Provides full protection against an appreciation of the EUR/USD rate.
- Net zero premium strategy.
- If the spot does trade at or above 1.3115 and depreciates afterwards, customer may buy the EUR at a rate which is lower than the Forward.
- Barrier level 1.3115 is applicable at any time during the tenor.

#### Cons
- Customer is hedged at a guaranteed rate which is higher than the Forward.
- If the spot does not trade at or above 1.3115, customer will not be able to benefit from a depreciation of the spot and will be obliged to buy the EUR at 1.3115.
**Contingent Forward**

*Low risk, 100% Hedge, limited downside participation*

- The Contingent Forward is a zero cost strategy and provides full protection against the appreciation of the spot rate EUR/USD. At the same time the customer will be able to benefit from the depreciation of the spot rate down to a pre-determined level.
- Customer is (a) guaranteed a maximum rate of 1.3025 and (b) able to benefit from EUR/USD depreciation down to 1.2025.
- If the EUR/USD spot rate trades at or below 1.2025 or at or above 1.3675 at any time during the tenor, customer will be required to buy the EUR at 1.3025, regardless where there spot is at expiry.

### Graphical overview

- **Realized rate vs. Underlying spot**
- **Contingent forward**
- **Barrier(s) hit**: Yes, No
- **Barrier(s) is not hit**: Underlying spot

### Spot at expiry

<table>
<thead>
<tr>
<th></th>
<th>Below 1.3025</th>
<th>Below 1.3025</th>
<th>Above 1.3025</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spot</strong></td>
<td>1.2200</td>
<td>1.2200</td>
<td>1.3400</td>
</tr>
<tr>
<td><strong>Trigger(s) hit</strong></td>
<td>Yes</td>
<td>No</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>Realized rate</strong></td>
<td>1.3025</td>
<td>1.2200</td>
<td>1.3025</td>
</tr>
</tbody>
</table>

### Pros

- Provides full protection against an appreciation of the EUR/USD rate.
- Net zero premium strategy.
- If the spot depreciates but does not trade at or below 1.2025 or at or above 1.3675, customer may buy the EUR at a rate which is lower than the Forward.

### Cons

- Customer is hedged at a guaranteed rate which is higher than the Forward.

---

Insets:

- **Pro**
- **Cons**
- **Graphical overview**
- **Spot at expiry**

---

**ING**
**Inverse Cylinder**

*Low risk, 100% Hedge, limited upside participation*

- An Inverse Cylinder is a zero cost strategy and provides a maximum and a minimum realizable rate for the EUR against the USD. It gives the opportunity to profit from an appreciation until a pre-determined level and provides protection to a further appreciation.

- It involves the purchase of an In-The-Money Call option and the sale of an In-The-Money put option for the same amount. The premium raised by the sale of the Put matches the cost of the purchased Call Option.

- Customer buys a Call option on the EUR with a strike of 1.2650 and sells a Put option on the EUR with a strike of 1.3200, thus being assured of a maximum and minimum buying price for the EUR against USD.

<table>
<thead>
<tr>
<th>Spot at expiry</th>
<th>Below 1.2650</th>
<th>Between 1.2650 and 1.3200</th>
<th>Above 1.3200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2400</td>
<td>1.2925</td>
<td>1.3500</td>
</tr>
<tr>
<td>Realized rate</td>
<td>1.3200</td>
<td>1.2925</td>
<td>1.2650</td>
</tr>
</tbody>
</table>

**Pros**
- Provides full protection against an appreciation of the EUR/USD rate
- Net zero premium strategy
- Compared to a Forward, customer is able to buy the EUR at a lower rate if the spot at expiry is above 1.2925

**Cons**
- Customer is only able to benefit from a appreciation in EUR/USD; the effective rate rises if EUR/USD depreciates
- Customer is hedged at a guaranteed rate which is higher than the Forward
**Seagull**

Low risk, 100% Hedge, downside participation

- A Seagull is a zero-cost strategy and provides full protection against the appreciation of the EUR/USD exchange rate, while at the same time allowing the customer to benefit from a depreciation of the spot rate until and below a pre-determined level.

- Customer buys a call option on the EUR at a strike of 1.3700, sells a put option on the EUR at a strike of 1.2800, and buys a put option on the EUR at a strike of 1.2200.

- Customer is (a) guaranteed a maximum rate of 1.3700 (Call level), (b) is able to benefit from EUR/USD depreciation until 1.2800 and (c) is able to benefit from EUR/USD depreciation below 1.2200, with a realized rate computed as follows: Spot at expiry + (1.2800 - 1.2200).

### Graphical overview

<table>
<thead>
<tr>
<th>Realized rate</th>
<th>1.3700</th>
<th>1.2800</th>
<th>Seagull</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spot at expiry</td>
<td>1.2200</td>
<td>1.2800</td>
<td>1.3700</td>
</tr>
</tbody>
</table>

### Spot at expiry

<table>
<thead>
<tr>
<th>Below 1.2200</th>
<th>Between 1.2200 &amp; 1.2800</th>
<th>Between 1.2800 &amp; 1.3700</th>
<th>Above 1.3700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>Realized rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2000</td>
<td>1.2600</td>
<td>1.3200</td>
<td>1.3900</td>
</tr>
</tbody>
</table>

### Pros

- Provides full protection against an appreciation of the EUR/USD rate.
- Net zero premium strategy.
- Opportunity to benefit from a depreciation of EUR/USD until 1.2800.
- Opportunity to benefit from a depreciation of EUR/USD below 1.2200.

### Cons

- Customer is hedged at a guaranteed rate which is higher than the Forward.
- If the spot trades between 1.2200 and 1.2800, the customer has to buy EUR at 1.2800.
- The realized rate if spot trades below 1.2200 will be higher than the market rate.
Bonus European Forward Extra  
Low risk, 100% Hedge, downside participation

- A Bonus European Forward Extra is a zero-cost strategy appropriate for upside protection combined with a bullish view on EUR/USD.
- The strategy provides full protection against appreciation of the EUR/USD exchange rate while at the same time allowing the customer to benefit from a depreciation of the rate until a pre-determined level.
- In addition, if a barrier on the upside gets hit at any time during the tenor, the customer receives a ‘bonus’. The bonus level can be chosen freely and will impact the worst and best case rate. The higher the barrier, the higher the bonus (ceteris paribus).
- Customer is (a) guaranteed a maximum rate of 1.3200, (b) is able to benefit from EUR/USD depreciation down to 1.2400, and (c) will receive a ‘bonus’ of USD 0.0450 if EUR/USD trades above 1.4100 at any moment during the full tenor.

**Graphical overview**

**Spot at expiry**

<table>
<thead>
<tr>
<th>Below</th>
<th>Below</th>
<th>Between</th>
<th>Between</th>
<th>Between</th>
<th>Between</th>
<th>Above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot</td>
<td>1.2400</td>
<td>1.3200</td>
<td>1.4100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest Spot</td>
<td>≥1.4100 &lt;1.4100</td>
<td>≥1.4100 &lt;1.4100</td>
<td>≥1.4100 &lt;1.4100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realized Rate</td>
<td>1.2750 1.3200 1.2400 1.2850 1.2750 1.3200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pros**

- Provides full protection against an appreciation of the EUR/USD rate
- Net zero premium strategy
- If spot depreciates but does not trade at or below 1.2400 at expiry, customer may buy the EUR at the market rate
- Customer receives ‘bonus’ if EUR/USD hits 1.4100 during the tenor

**Cons**

- If EUR/USD does not hit 1.4100 during the tenor, customer is hedged at a guaranteed rate which is higher than the Forward
- If spot at expiry trades at or below 1.2400, customer is obliged to buy EUR at 1.3200 or 1.2750, depending on the barrier being hit or not.
2. **Asset side**

FX Deposits
FX Deposits

For illustration purposes, the strategies presented in the third part of this book follow these assumptions
- Client has EUR available for deposit
- Client is willing to be exposed to the EUR/USD currency pair (GBP/USD for the FX Quanto Participation Note)
- Tenor is for 3 months
- Regular deposit rate is 0.50%
- Reference spot rate is at 1.3000 for EUR/USD and 1.6000 for GBP/USD

Product summary
- **FX Range Deposit**: possibility of yield pick up, low interest rate risk, no notional risk
- **FX Range Accrual Note**: possibility of yield pick up, low interest rate risk, no notional risk
- **Dual Currency Deposit**: yield pick up, no interest rate risk, notional at risk
- **FX Quanto Participation Note**: possibility of yield pick up, interest risk, no notional risk
FX Range Deposit

Yield pick up: 2.80%; Interest Rate risk: Low; Notional risk: No.

- An FX Range Deposit is a short term deposit with the possibility to receive a higher interest rate compared to the regular deposit rate.
- The high interest rate will be received if the spot rate of the underlying currency pair stays within the pre-determined range during the full tenor of the transaction.
- As a result of taking a view on the range of movements of a currency pair, customer is able to invest excess cash in a higher yielding asset.

### Graphical overview

**Interest rate (%)**

<table>
<thead>
<tr>
<th>Spot during observation period</th>
<th>0.00</th>
<th>0.50</th>
<th>3.30</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 1.2500 to 1.3500</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High interest rate</th>
<th>3.30%, if EUR/USD stays within the range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low interest rate</td>
<td>0.00%, if EUR/USD does not stay within the range</td>
</tr>
</tbody>
</table>

### Mechanics

- **Range:** 1.2500-1.3500
- **Observation period:** From moment of transaction to the moment of expiry
- **High interest rate:** 3.30%, if EUR/USD stays within the range
- **Low interest rate:** 0.00%, if EUR/USD does not stay within the range

### Pros

- If spot remains within range, yield pick up from regular deposit is 2.80%
- At the deposit end date the notional amount will be available again
- Short term deposit (up to 12 months)

### Cons

- Minimum interest rate is lower than the regular deposit rate
- Early redemption is not possible
FX Range Accrual Note

Yield pick up: 0.70%; Interest Rate risk: Low; Notional risk: No.

• An FX Range Accrual Note is a short term note with the possibility to receive a higher interest rate compared to the regular deposit rate.

• The received interest is a function of the number of times that spot fixes within a predetermined range. For example: if 32 out of 64 fixings are within the range, the received interest rate will be 50% of the maximum interest rate possible.

• As a result of taking a view on the range of movements of a currency pair, customer is able to invest excess cash in a higher yielding asset.

Graphical overview

<table>
<thead>
<tr>
<th>Interest rate (%)</th>
<th>Visual representation of interest rate range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>1.2700</td>
</tr>
<tr>
<td>0.50</td>
<td>1.3300</td>
</tr>
<tr>
<td>1.20</td>
<td>(Max. Interest Rate)</td>
</tr>
</tbody>
</table>

Mechanics

Range: 1.2700-1.3300

Observation period: Daily fixings from inception date until expiry

Interest rate: Maximum Interest Rate * n/N

n = number fixings inside range,
N = total number of fixings

Pros

• If spot fixes inside range every fixing day, the yield pick up from regular deposit is 0.70%
• At the note end date the notional amount will be available again
• Short term note (up to 12 months)

Cons

• Minimum interest rate is lower than the regular deposit rate
• Early redemption is not possible
**FX Dual Currency Deposit**

*Yield pick up: 4.00%; Interest rate risk: None; Notional risk: Yes.*

- The FX Dual Currency Deposit (‘DCD’) is a short term deposit which provides a higher interest rate than the regular deposit rate in exchange for the bank’s right to repay the deposit notional amount in a second currency. Interest is always paid in the deposit currency.
- An exchange rate for the currency pair (conversion rate) is set at the contract inception.
- Repayment of the deposit notional amount in the second currency will occur if the spot exchange rate at expiry is less attractive for the bank than the pre-determined conversion rate.

### Mechanics

<table>
<thead>
<tr>
<th>Conversion rate:</th>
<th>1.3300</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCD rate:</td>
<td>4.50% in EUR</td>
</tr>
</tbody>
</table>

**If at expiry:**

<table>
<thead>
<tr>
<th>EUR/USD is at or below 1.3300:</th>
<th>Repayment will be in EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUR/USD is above 1.3300:</td>
<td>Repayment will be in USD</td>
</tr>
</tbody>
</table>

### Pros

- Yield pick up from regular deposit is 4%
- At the deposit end date the notional amount will be available again in either currency
- Short term deposit (up to 12 months)

### Cons

- Deposit notional in EUR is not guaranteed
- Exposure to FX risk
- Early redemption is not possible
FX Quanto Participation Note

Yield pick up: depending on spot; Interest rate risk: Yes; Notional risk: Limited.

- An FX Quanto Participation Note is a structured note linked to the performance of a foreign currency exchange rate. The level of participation in the positive performance of the underlying is determined at inception and redeemed in the Currency of Denomination, and depends on how much notional risk the investor accepts to take.
- The FX Quanto Participation Note is enabling the investor to get exposure on a different currency pair than the currency of the underlying deposit without running an exchange rate risk on the achieved performance.

Graphical overview

### Mechanics

<table>
<thead>
<tr>
<th>Notional:</th>
<th>EUR 1,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underlying Currency (U):</td>
<td>GBP/USD</td>
</tr>
<tr>
<td>Strike (S):</td>
<td>1.6000</td>
</tr>
<tr>
<td>Participation (P):</td>
<td>50% of EUR notional</td>
</tr>
<tr>
<td>Capital Guarantee:</td>
<td>99%</td>
</tr>
<tr>
<td>Redemption (% of EUR Notional):</td>
<td>99% + P * Max((U&lt;sub&gt;£/$&lt;/sub&gt;Expiry – S&lt;sub&gt;£/$&lt;/sub&gt;) / S&lt;sub&gt;£/$&lt;/sub&gt;; 0%)</td>
</tr>
</tbody>
</table>

### Pros

- Possibility to enhance yield via exposure on a currency pair different than underlying
- At the deposit end date the guaranteed part of the notional will be returned in investment currency
- Short term deposit (up to 12 months)

### Cons

- A lower interest rate than the current market rate might be realized.
- Early redemption is not possible
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