

# Insights from FX hedging backtesting analysis for shekel buyers

## Highlights

- Hedgers of FX risk generally favor instruments that can be entered into for zero cost.
- Cylinders, also referred to as collars, are a popular zero premium alternative that grants both protection and upside potential, widely used by buyers of shekel.
- Empirical evidence shows, however, that risk-reward proposition offered by cylinders has not translated into outperformance versus standard FX forward contracts.

## The opportunity cost of FX forwards

An FX forward contract represents a contractual obligation to exchange one currency for another at a predetermined rate and date in the future. When used for risk management purposes, forwards offer price protection, but no flexibility for upside. A buyer of shekel who executes a forward will be economically better off if the shekel strengthens but will experience an opportunity cost if the shekel weakens as the contract obliges execution at the less advantageous rate.

In certain situations, the opportunity cost described does not necessarily discourage forward use. For instance, the purpose behind balance-sheet hedging is to insulate the income statement from FX remeasurement volatility. Losses on hedges are offset by gains on remeasurement of assets and liabilities, and vice versa. The target net P&L is zero, and how you get to zero does not matter.

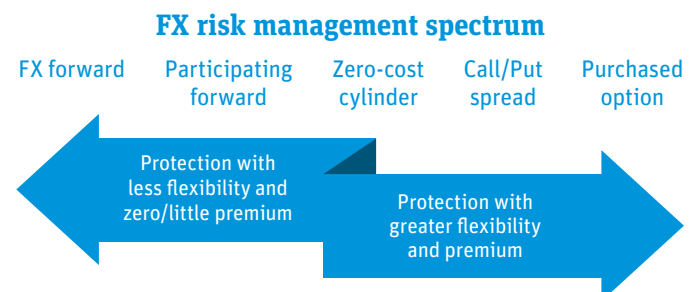
## Forward alternatives

In contrast, hedgers that operate under more economically-minded mandates, as opposed to accounting ones as previously described, may want to minimize the opportunity cost to the extent possible. If forwards are on one end of the risk management spectrum, purchased options are on the other. A buyer of shekel who executes a call option on the target currency is not obligated to execute at the strike rate of the option. If the shekel subsequently weakens, the hedger can simply walk away from the option and execute at the more

favorable market rate. The option is there should they need it; if the shekel strengthens. The catch, of course, is that an upfront premium payment is required. While warranted based on the expected payout of the option, many end users may not be able to justify the initial cash outlay.

## The compromise

With the ends of the spectrum defined, then zero-cost cylinders represent a compromise between the two. This structure is made up of a combination of options where the hedger purchases out-of-the-money protection but finances it by simultaneously selling a second out-of-the-money option in the opposite direction. The premiums of both options offset, thus making it zero cost to enter. Cylinders are considered a compromise between the two ends of the spectrum, as the hedger gets protection, albeit a less advantageous rate of protection versus the prevailing forward, but in exchange receives upside potential whereas the forward offers none, although limited to the sold strike<sup>1</sup>.



Source: SVB FX Risk Advisory

<sup>1</sup> Please refer to appendix section, which contains historical pricing on both products, for tangible examples of tradeoff.

## Cylinders versus forwards

From our vantage point as an FX liquidity provider to private equity funds, venture funds, and corporates in the UK SVB client portfolio, we know cylinders are a popular hedging vehicle choice for active hedgers. Advocates of cylinders argue that in addition to receiving some upside potential, there are two more features that make them attractive versus forwards in shekel, ex post naturally. First, the basis (or forward points) in USD/ILS are negative, implying forward hedgers essentially lock into a less

advantageous rate than spot. And two, the implied volatility skew in USD/ILS options markets is such that the upside offered by a zero-cost cylinder is greater than the potential loss measured from spot at inception. In other words, the range is skewed in favor of the buyer. Over the last decade, in fact, this upside-to-downside ratio or favorable skew has averaged 1.25<sup>2</sup>. Stated differently, on average the upside potential has typically been 25% greater than the tolerance for downside.

So, the marketing pitch in favor of the cylinder over the forward is flexibility, avoiding the negative carry, and more upside than downside. Does this always guarantee a better economic outcome, however?

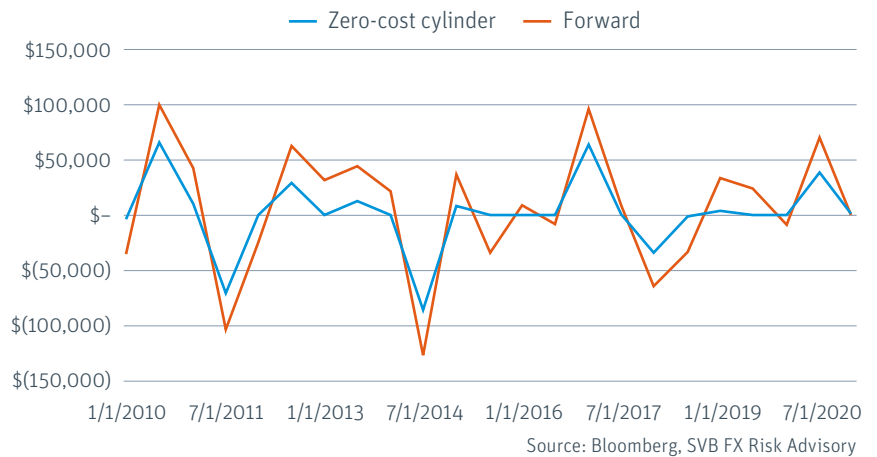
## Backtesting analysis

Using spot, forward, and option pricing data from Bloomberg, we ran a backtesting analysis to determine the ex post performance of cylinders versus forwards. We went back 10 years and assumed that on January 1<sup>st</sup> and July 1<sup>st</sup> of each year, the hedger executed a 6-month cylinder to hedge against ILS appreciation on a notional of \$1,000,000 each time (hedger sells \$1,000,000 to buy shekel). The cylinders were systematically determined by setting the purchased USD put 3% out-of-the-money and then solving for the sold USD call. We ran a second analogue strategy involving 6-month forwards to serve as the benchmark<sup>3</sup>.

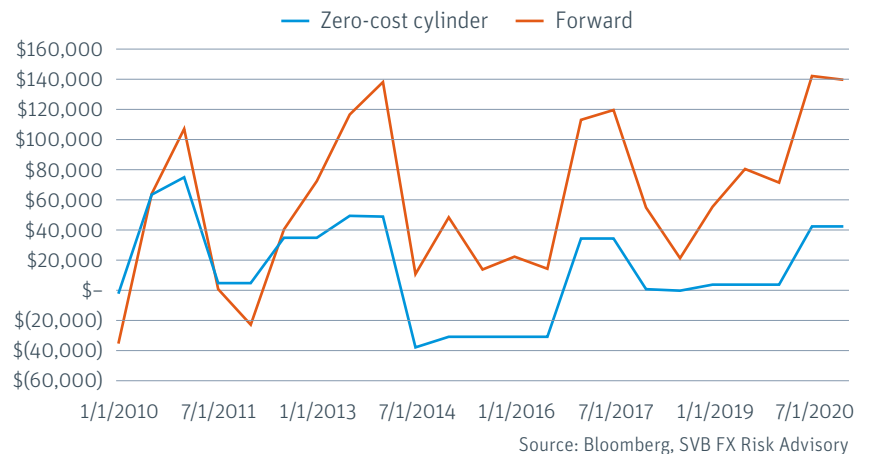
The chart tracks the savings attained from each product on \$1mm of FX exposure over the last decade. When the line for the forward is above the cylinder, this means savings attained was greater for the forward, as was the case 61% of the time over this sample.

Furthermore, the cumulative savings over the historical period was \$138k for the forwards versus only \$42k for the cylinders, illustrated by the second chart. The cylinders added value, but the forwards added more still.

### Savings on \$1M of FX exposure



### Cumulative savings



<sup>2</sup> See appendix for historical data used for this calculation.

<sup>3</sup> Refer to the appendix section for the historical FX forward and FX cylinder data in our study. In addition to the rates, we quantified the basis, as well as the historical upside-to-downside ratio offered by the collar.

## Bottom line

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Zero-cost cylinders, a popular hedging strategy for protecting the purchasing power of USDs in exchange for shekels, has underperformed standard forward contracts over the last decade. The intuition behind this result can be summarized as follows:

1. The Israeli shekel has spent more time rising than falling during the period 2010-2020 and thus forwards provided better protection despite the negative carry.
2. The favorable option volatility skew, which as discussed manifests itself in a favorable upside to downside ratio on the zero-cost cylinders, was not enough to compensate for less advantageous protection levels offered versus the forwards.

While past performance is not a guarantee of future results, the key takeaway from this exercise is that the added flexibility, avoidance of negative carry, and favorable upside to downside ratio for the cylinder does not need to translate into better economic value. It did not happen over this period, and similarly may not happen over a future period if such is characterized by USD weakness.

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## Appendix

	Forwards	Zero-cost cylinders			Forwards	Zero-cost cylinders		
	shekel per \$1	Worst case	Best case		Basis	Downside	Upside	Upside to downside ratio
1/4/2010	3.7548	3.6422	3.8808	1/4/2010	0.0020	0.1126	0.1260	1.1190
7/1/2010	3.8983	3.7814	4.0590	7/1/2010	0.0014	0.1169	0.1607	1.3747
1/3/2011	3.5475	3.4411	3.6671	1/3/2011	0.0104	0.1064	0.1196	1.1241
7/1/2011	3.4141	3.3117	3.5473	7/1/2011	0.0338	0.1024	0.1332	1.3008
1/3/2012	3.8337	3.7187	4.0066	1/3/2012	0.0105	0.1150	0.1729	1.5035
7/2/2012	3.9462	3.8278	4.1396	7/2/2012	0.0229	0.1184	0.1934	1.6334
1/2/2013	3.7424	3.6301	3.9067	1/2/2013	0.0213	0.1123	0.1643	1.4630
7/1/2013	3.6473	3.5379	3.7972	7/1/2013	0.0141	0.1094	0.1499	1.3702
1/2/2014	3.4991	3.3941	3.6514	1/2/2014	0.0083	0.1050	0.1523	1.4505
7/1/2014	3.4271	3.3242	3.5882	7/1/2014	0.0023	0.1029	0.1611	1.5656
1/2/2015	3.9291	3.8112	4.0880	1/2/2015	-0.0060	0.1179	0.1589	1.3478
7/1/2015	3.7822	3.6687	3.9143	7/1/2015	-0.0061	0.1135	0.1321	1.1639
1/4/2016	3.9012	3.7842	4.0333	1/4/2016	-0.0181	0.1170	0.1321	1.1291
7/1/2016	3.8328	3.7178	3.9523	7/1/2016	-0.0185	0.1150	0.1195	1.0391
1/3/2017	3.8406	3.7254	3.9637	1/3/2017	-0.0223	0.1152	0.1231	1.0686
7/3/2017	3.4809	3.3765	3.5799	7/3/2017	-0.0262	0.1044	0.0990	0.9483
1/2/2018	3.4266	3.3238	3.5396	1/2/2018	-0.0289	0.1028	0.1130	1.0992
7/2/2018	3.6226	3.5140	3.7458	7/2/2018	-0.0469	0.1086	0.1232	1.1344
1/2/2019	3.6996	3.5886	3.8144	1/2/2019	-0.0527	0.1110	0.1148	1.0342
7/1/2019	3.5405	3.4343	3.6484	7/1/2019	-0.0396	0.1062	0.1079	1.0160
1/2/2020	3.4141	3.3117	3.5308	1/2/2020	-0.0350	0.1024	0.1167	1.1396
7/1/2020	3.4347	3.3317	3.5833	7/1/2020	-0.0184	0.1030	0.1486	1.4427
1/4/2021	3.2014	3.1054	3.3246	1/4/2021	-0.0104	0.0960	0.1232	1.2833
				<b>Average</b>	-0.0088	0.1093	0.1368	1.2500

Source: Bloomberg, SVB FX Risk Advisory

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### Notes

The basis is the difference between spot and forward rates at inception.

Downside is the difference in pips between spot and strike rate on ILS call.

Upside is the difference in pips between spot and strike rate on ILS put.

Upside-to-downside ratio is upside divided by downside pips.

### Risk statement

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