xplodde

Cryptocurrency Forwards

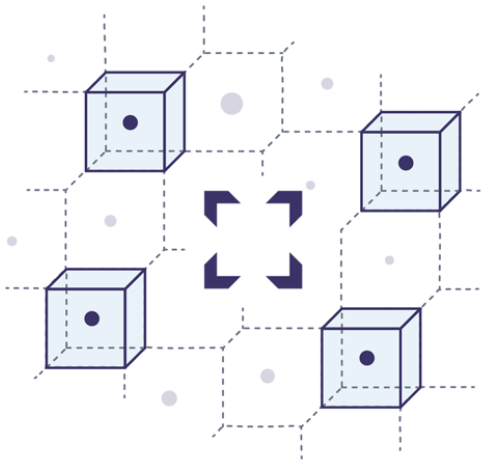
Complete Guide 2018

Version 1.0.1 – Working Draft / Request for Comments

xplodde.com/download

#1 What are Cryptocurrency Forwards?

Cryptocurrency Forwards (CFs) are contracts between two parties whereby both agree to exchange the market value difference of a crypto or fiat currency, the underlying asset, at a future date. The value differential relates to the market value difference of the underlying asset between the beginning and the end of the contract period.



CFs are peer-to-peer smart contracts run on the Ethereum's blockchain and are enforced on an automated and decentralised basis. That means neither Xplodde nor any bank or middlemen is involved in the execution of contract specifications. The decentralised nature of blockchain technology ensures smart contracts' transactions are accurately executed by thousands of computers spread all around the globe.

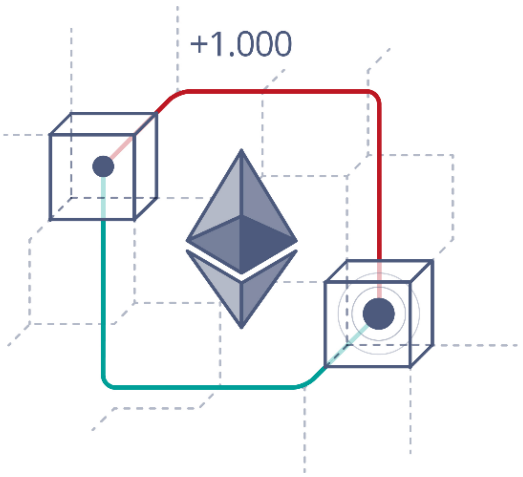
CFs native cryptocurrency is Ether (ETH), which is in turn the native cryptocurrency of the Ethereum network. Thereby, all currency pairs of crypto forwards are nominated in ETH relative to any other crypto or fiat currency (e.g. Bitcoin, Ripple or Euros). A way to see ETH in this context is as your "national" currency and how much of it is needed to buy any other crypto (fiat) currency. It is common to see in digital assets exchanges the price of ETH in say Euros (ETH/EUR), for example at ETH/EUR400. This means you must pay EUR400 per unit of ETH. In contrast, in a CF this price would be quoted as the inverse, EUR/ETH0.0025 (= 1/400), which means you need to spend ETH0.0025 to buy one Euro. Although both prices would be equivalent, the latter represents ETH as the reference currency.

#2 Contract Features

Underlying Assets, Positions and Profit & Losses (P&L)

When trading Crypto forwards, contracting parties agree to exchange the ETH value differential of a crypto or fiat currency over contracts' life, this is the underlying asset. Put differently, buying or selling the underlying asset isn't the exchange of a specific amount of two currencies but the exchange of the difference in value of one currency, nominated in ETH, from the beginning until the end of the contract.

Buy Position: If you buy a CF, you will reflect a gain (loss) if the price of the chosen cryptocurrency is higher (lower) at the end of the contract compared to the initial price. In other words, you will record a profit (loss) if the underlying asset is positive (negative).



Sell Position: If you sell a CFs, you will reflect a gain (loss) if the price of the chosen cryptocurrency is lower (higher) at the end of the contract compared to the initial price. In other words, you will record a profit (loss) if the underlying asset is negative (positive).

The initial price at the beginning of the contract is computed at the current market value of the associated currency pair, retrieved by an oracles network (we call it "**Federation**") from a digital asset exchange such as Bitstamp or Kraken, right after[1] the two contracting parties accept the contract terms.

	Buy	Sell
Price increase (↑)	Gain	Loss
Price degrease (↓)	Loss	Gain

Closing out a contract isn't possible when trading crypto forwards. Yet, it is feasible to apply what we call **"reversing"**. Reversing implies creating the opposite trade initially made (i.e. selling a crypto forward if you bought it and vice versa), maintaining the same initial terms such as currency pair, contract value and margins while limiting the duration to the remaining days in your initial contract. If successful, reversing will largely neutralise your initial contract provided your counterparty risk remains equal.

[1] There could be some delay between the exact moment contracting parties agree on contract terms and the computation of the last market price from a digital assets exchange.

Federations (Decentralised Oracles Network)

Federations are group of oracles responsible to put market prices on the Ethereum's blockchain by adhering to Kilauea protocol (See Section 4 for more detail).

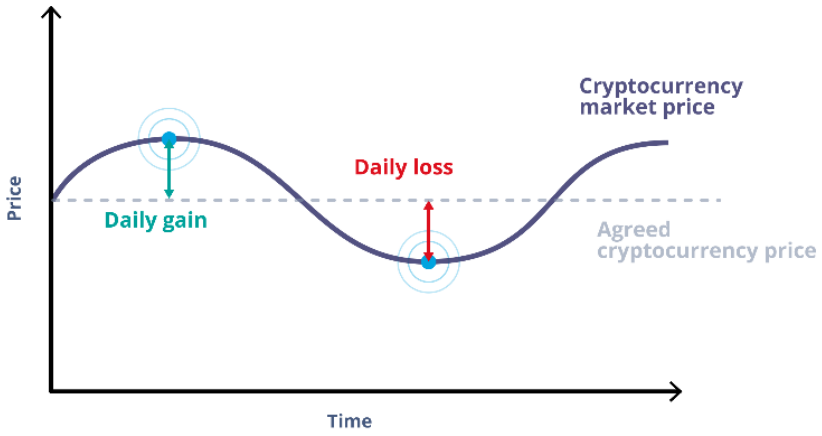
Settlements

Crypto forwards attach a settlement date so that contracting parties agree on a future date to exchange the value of the underlying asset. The length of the contract is called "Duration" and specifies the number of days until the contract settles and is self-destroyed. The minimum length is one day and there's no upper limit for the maximum length. Note that the further your Duration the more uncertain will be the future cash flows associated with your crypto forwards.

Furthermore, settlements are made on an automated basis by the algorithm embedded into the smart contract. It computes calculations based on the contract specifications defined by contracting parties, and automatically executes the related transactions between them.

Mark-to-Market (MTM) Approach and Margins

The MTM approach is a mechanism which seeks to reduce counterparty risk, especially in settings where contracting parties don't know each other's identity. Its purpose is to ensure parties possess enough funds to fulfil their obligations at the end of the contract (i.e. to pay any amounts owed to the counterparty). This is achieved by requiring **daily settlements** and **contract margins**.



Daily settlements imply gains and losses are computed daily, depending on upward and downward moves in the value of the underlying asset. As a result, no loss is carried forward until the end of the contract but cleared up daily. This prevents significant accumulated losses due to

large price fluctuations which may encourage counterparties to withdraw from their contracting obligations by the end of the contract. Daily settlements of crypto forwards are computed **each day at 08:00AM CEST**[2].

Example 1. Price at the beginning of the contract is BTC/ETH10

Price at the end of		Price differential	Buyer Daily Profit/Loss	Seller Daily Profit/Loss
Day 1	BTC/ETH12	+ ETH2 per BTC	ETH2 profit	ETH2 loss
Day 2	BTC/ETH10	- ETH2 per BTC	ETH2 loss	ETH2 profit
Day 3	BTC/ETH14	+ ETH4 per BTC	ETH4 profit	ETH4 loss
Day 4	BTC/ETH11	- ETH3 per BTC	ETH3 loss	ETH3 profit

On the other hand, an additional measure to reduce counterparty risk is margin accounts. Contracting parties must pay an **initial margin** when creating a new contract. This margin is a deposit proportional to the contract value (i.e. price of the currency in ETH times the number of units) at its very inception. It ensures parties have some available funds to cover potential accumulated losses. For example, if the contract required the payment of BTC10 at a BTC/ETH12 rate, then the total contract value would be ETH120(= 10 * 12). Thereby, if the initial margin was set up at say 50%, the initial margin to be paid would equal ETH60 (= 120 * 50%). If it was 10%, then ETH12 (= 120* 10%) and so on. The **account balance** of all contracting parties equals the initial margin at the beginning of the contract and then builds up depending on accumulated daily gains and losses over contracts' life.

Moreover, each crypto forward is also set up with a **maintenance margin**. The goal of this margin is to safeguard the initial deposit of both contracting parties so that it never goes to zero. The maintenance margin is a proportion of the initial margin and is the threshold that triggers a margin call. Following the previous example of an initial margin of ETH60, if the maintenance margin was at 50%, a margin call would be triggered when the account balance falls below ETH30 (= 60 * 50%). If it was at 10% then when it is lower than ETH6 (= 60 * 10%) and so on.

A **margin call** is a request from the smart contract to top up an account balance[3] up to the initial margin, within a 12-hours period in the case of CFs, by a contracting party who has accumulated

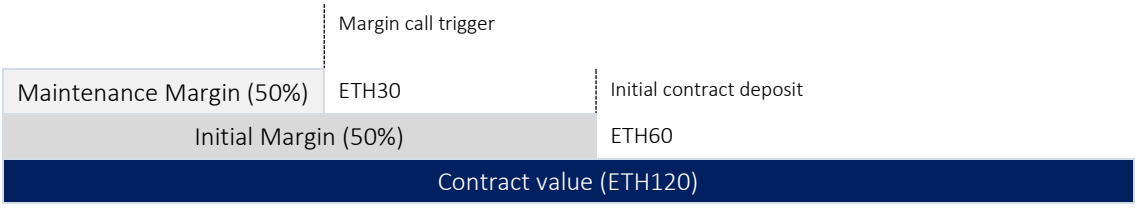
[2] TBC

[3] An account balance reflects the accumulated funds, based on accumulated gains and losses, a contracting party holds in a crypto forward.

a level of losses exceeding the maintenance margin. Fail to do so the smart contract will transfer the remaining account balance of the party with the accumulated losses to the party with the accumulated gains.

Margin calls are automatically triggered right after each daily settlement. Fulfilling this payment obligation only requires contracting parties to deposit the associated amount into their contract address.

Example 2. Contract size of BTC10 at a ETH/BTC12 price with margins set up at 50% each



Does it mean an account balance can never go to zero? Unfortunately, not, it will depend on the volatility of the underlying asset and the value of the initial margin. If the volatility is too high, the full account balance might collapse to zero by a single large price fluctuation. Additionally, this is further exacerbated as initial margins are set up lower. Tables 1 and 2 show an example of all transactions associated with a cryptocurrency forward from the view of both a buyer and a seller.

Peer-to-Peer (P2P) and Tailor-made

Cryptocurrency forwards are P2P agreements under a smart contract on the blockchain, meaning no bank or any other middleman is involved. Contracting parties cannot withdraw from their commitment[4] and no crypto forward can be traded on a secondary market since they aren't tradable tokens.

In addition, Xplodde doesn't embed any "back-doors" whereby it could exert centralised power to control over users' contracts and cryptocurrency balances, such as freezing, altering or deleting contracts and account balances. CFs are purely P2P digital contracts handled by a one single virtual and decentralised smart contract run on the Ethereum network. Contract terms of cryptocurrency forwards tailor contracting parties' requirements such as the underlying asset, contract length and size, as well as margin levels depending on their financial flexibility needs and counterparty risk aversion.

[4] The only way to neutralise an open contract by a contracting party is to enter a new one with the same parameters and days left but in the opposite direction (i.e. if initially was bought then the strategy would be to sell it and vice versa). This strategy assumes counterparties meet contracting obligations throughout the life of the contracts.

Table 1. Summary of Cryptocurrency Forward from a Buyer's view (all amounts in ETH)

Day	Price	Settlement Price	Daily Gain	Cumulative Gain	Account Balance (0)	Margin Call	Account Balance (1)
1	**10.00000**				**50.00000**		
1		12.00000	20.00000	20.00000	70.00000	0.00000	70.00000
2		10.00000	-20.00000	0.00000	50.00000	0.00000	50.00000
3		14.00000	40.00000	40.00000	90.00000	0.00000	90.00000
4		11.00000	-30.00000	10.00000	60.00000	0.00000	60.00000
5		9.00000	-20.00000	-10.00000	40.00000	0.00000	40.00000
6		**7.00000**	**-20.00000**	**-30.00000**	**20.00000**	**30.00000**	**50.00000**
7		7.50000	5.00000	-25.00000	55.00000	0.00000	55.00000
8		6.50000	-10.00000	-35.00000	45.00000	0.00000	45.00000
9		**1.50000**	**-50.00000**	**-85.00000**	**-5.00000**	**55.00000**	**50.00000**
10		5.00000	35.00000	-50.00000	85.00000	0.00000	85.00000
11		9.00000	40.00000	-10.00000	125.00000	0.00000	125.00000
12		11.00000	20.00000	10.00000	145.00000	0.00000	145.00000
13		10.50000	-5.00000	5.00000	140.00000	0.00000	140.00000
14		12.00000	15.00000	20.00000	155.00000	0.00000	155.00000
15		12.50000	5.00000	25.00000	160.00000	0.00000	160.00000
16	**13.00000**		**5.00000**	**30.00000**	**165.00000**	**0.00000**	**165.00000**

Contract Details (Buyer):

Pair	BTC/ETH		**Duration**	16 days
Quantity	BTC 10			
Contract Value	ETH 100	(10 bitcoin at ETH 10 per bitcoin)		
Initial Margin	50% (ETH 50)	(ETH 100 * 50%)		
Maintenance Margin	50% (ETH 25)	(ETH 50 * 50%)		

Table 2. Summary of Cryptocurrency Forward from a Seller's view (all amounts in ETH)

Day	Price	Settlement Price	Daily Gain	Cumulative Gain	Account Balance (0)	Margin Call	Account Balance (1)
1	**10.00000**				**50.00000**		
1		12.00000	-20.00000	-20.00000	70.00000	0.00000	70.00000
2		10.00000	20.00000	0.00000	50.00000	0.00000	50.00000
3		14.00000	-40.00000	-40.00000	90.00000	0.00000	90.00000
4		11.00000	30.00000	-10.00000	60.00000	0.00000	60.00000
5		9.00000	20.00000	10.00000	40.00000	0.00000	40.00000
6		**7.00000**	**20.00000**	**30.00000**	**20.00000**	**30.00000**	**50.00000**
7		7.50000	-5.00000	25.00000	55.00000	0.00000	55.00000
8		6.50000	10.00000	35.00000	45.00000	0.00000	45.00000
9		**1.50000**	**50.00000**	**85.00000**	**-5.00000**	**55.00000**	**50.00000**
10		5.00000	-35.00000	50.00000	85.00000	0.00000	85.00000
11		9.00000	-40.00000	10.00000	125.00000	0.00000	125.00000
12		11.00000	-20.00000	-10.00000	145.00000	0.00000	145.00000
13		10.50000	5.00000	-5.00000	140.00000	0.00000	140.00000
14		12.00000	-15.00000	-20.00000	155.00000	0.00000	155.00000
15		12.50000	-5.00000	-25.00000	160.00000	0.00000	160.00000
16	**13.00000**		**-5.00000**	**-30.00000**	**165.00000**	**0.00000**	**165.00000**

Contract Details (Seller):

Pair	BTC/ETH	
Quantity	BTC 10	
Contract Value	ETH 100	(10 bitcoin at ETH 10 per bitcoin)
Initial Margin	50% (ETH 50)	(ETH 100 * 50%)
Maintenance Margin	50% (ETH 25)	(ETH 50 * 50%)

Duration 16 days

Table 3. List of Functionalities

Function	Inputs	Description
Privacy	(Public, Private)	Public contracts are shown in the search tool of Xplodde app so other potential users can accept them if interested. Private contracts aren't shown in the search too but accepted privately between two parties.
Action	(Buy, Sell)	It defines whether you want to buy or sell a cryptocurrency forward.
Underlying Asset	Currency pair (Currency/ETH)	It's the ETH cost of a crypto or fiat currency (e.g. BTC/ETH; EUR/ETH; XRP/ETH).
Quantity	Currency units (non-ETH)	It's the number of units of currency (non-ETH) you want to include in the contract value (e.g. BTC10, EUR100; XRP1000).
Initial Martin	(1%-100%) of contract value	It's the proportion of the contract value.
Maintenance Margin	(1%-100%) of initial margin	It's the proportion of the initial margin.
Duration	Number of days	Contract length in days.
Contract Destruction	(Destroy contract)	It is possible to destroy a contract after created provided no counterparty has accepted the terms yet.

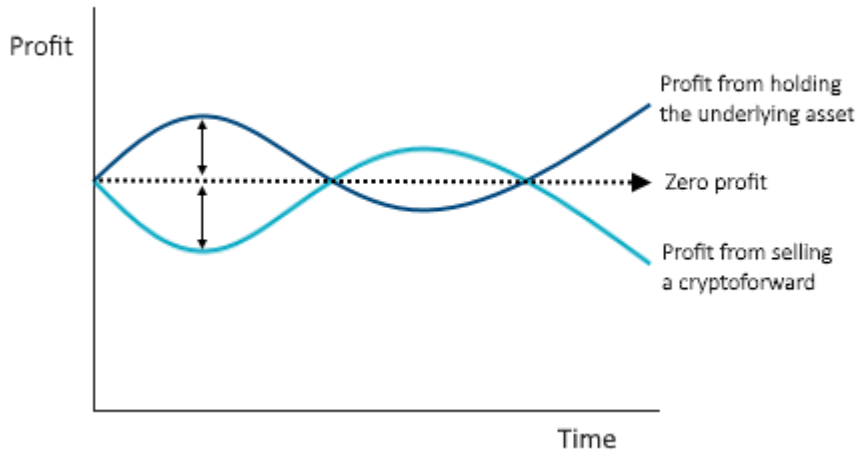
#3 Use Cases

Speculation

Speculating prices means you are making bets as to whether a price will increase or decrease over a certain period to make a profit. Speculating with CFs is simple. If you believe the market price of a certain currency will appreciate over a specific period, you will buy a cryptocurrency forward and tailor the contract terms to your target currency and period. If your bet proved correct you will enjoy a profit and a loss otherwise. The opposite applies in the case of selling a CF.

Hedging

Hedging aims to remove the effects of uncertainty when it comes to future market price movements. For example, maybe you hold several bitcoins and expect to sell them in few months and so would like to fix the current market price for that period. In other words, you want to ensure the market price of bitcoin doesn't go down over that period no matter what. Alternatively, perhaps you don't hold any bitcoins but wish to buy some in few months. In this case your goal is to fix the current market price, so it doesn't go up in the following months.



Whatever your goals, the idea is with crypto forwards you can fix cryptocurrency prices over a target period. If you intend to sell a cryptocurrency in some months but want to maintain the current price, then you must sell a cryptocurrency forward. Hedging is achieved because whenever the price falls you will reflect a loss from holding that cryptocurrency but also an equal gain from your sold crypto forward.

The same logic applies when your intention is to buy a cryptocurrency in the future. You will buy a CF whenever you plan to buy a cryptocurrency at a future date. Although in this case you don't hold the cryptocurrency, as soon as the price goes up you are worse off based on your intentions to buy. This is exactly avoided by buying a CF which will imply a gain at any time prices go up.

Please, remember crypto forwards reference currency is Ether so prices are quoted with respect to ETH. This affects your approach for hedging if your reference currency isn't ETH. To illustrate this, suppose you hold several bitcoins and intend to sell them in one month for, say, euros (EUR). In this case you will need to create two CFs to hedge your overall position: you would need to buy a BTC/ETH crypto forward and buy a EUR/ETH one. The former will ensure you can sell your bitcoins for a certain amount of ETH. The latter will cover from losses related to a decrease in value of EUR relative to ETH.

#4 Federations (Decentralised Oracles Network)

Work-in-progress.

#5 Costs

CFs are very cost efficient financial instruments compared to the traditional ones. There are no fees for daily settlements and no cost for downloading and using Xplodde app. The only two associated costs are born when creating or destroying a contract, which are the network fee charged by miners in the Ethereum network and the federation fee required to put currency market prices on-chain.

Cryptocurrency Forward Costs	Price
Gas (Ethereum network fee) for contract creation and destruction	Usual network range
Federation fee (Price validations)	Depending on Federation
Daily Settlements fees	Free
Xplodde App download	Free

Kilauea Network Costs (Xplodde's Federation)	Price
Federation fee (Price validations)	Free

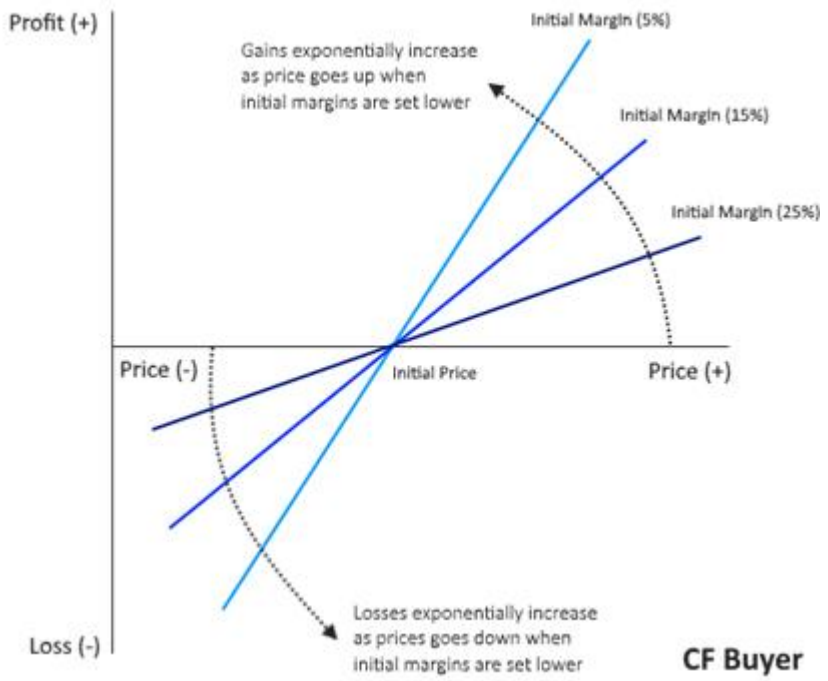
Why is it required to pay a fee to the Ethereum network and the federations? Gas is the fee required by miners in the Ethereum network to execute all transactions happening in the Ethereum blockchain. It is basically the incentive given to miners in a decentralised network to spend the energy power (Proof-of-Work protocol) or holding costs (Proof-of-Stake protocol) to compute transactions on the blockchain.

Likewise, federations are oracles networks, which can be more or less decentralised, responsible for putting external data (i.e. currency market prices) into the blockchain. For doing this, federations themselves born two different costs: The time and energy resources required for running computers that retrieve external data with an API from a digital asset exchange and the associated Gas paid to put this data into the Ethereum blockchain.

#6 Benefits of trading Cryptocurrency Forwards

Margin Trading

One of the key advantages of CF trading is the possibility of investing more funds than what you really own because of margin trading. When you enter into a CF your payment isn't the contract value but the initial margin, which is a proportion of the contract value, giving you extra cash to invest in further contracts or in larger ones.



The effect of trading with margin is of amplifying your returns, either positive or negative, as prices move up and down. Note the lower the initial margins of your portfolio of CFs the more significant the effect will be.

Example 1. [Price at the beginning of the contract is **BTC/ETH10**; Quantity of Bitcoins = 1; Initial Margin (A) = 100%; Initial Margin (B) = 10%]

Price	Profit (ETH)	Return without margin (A)	Return with margin (B)
BTC/ETH 12	+ ETH2	2/10 = 20%	2/1 = 200%
BTC/ETH 10	- ETH2	-2/10 = -20%	-2/1 = -200%
BTC/ETH 14	+ ETH4	4/10 = 40%	4/1 = 400%
BTC/ETH 11	- ETH3	-3/10 = -30%	-3/1 = -300%

Note also this amplifying effect comes with a proportional increase in the volatility of your portfolio returns and therefore its underlying risk. Consider you will need to provide additional funds as your accumulated losses exceed your maintenance margins. Fail to do so will imply the transfer of your account balance to your counterparties.

Speculate on falling prices

Trading CFs is a zero-sum game between you and your counterparty. That means your gains are her losses and vice versa. This brings a whole new way of making bets compared to buying stocks which is limited to bets on raising prices.

With CFs you can make bets not only on raising prices but also on downturn markets; this is analogue to “short-selling” in some stock exchanges. If you sell a CF, you are betting on prices going down in the future against your counterparty’s bet which is they’ll go up.

No Registration, Anonymous

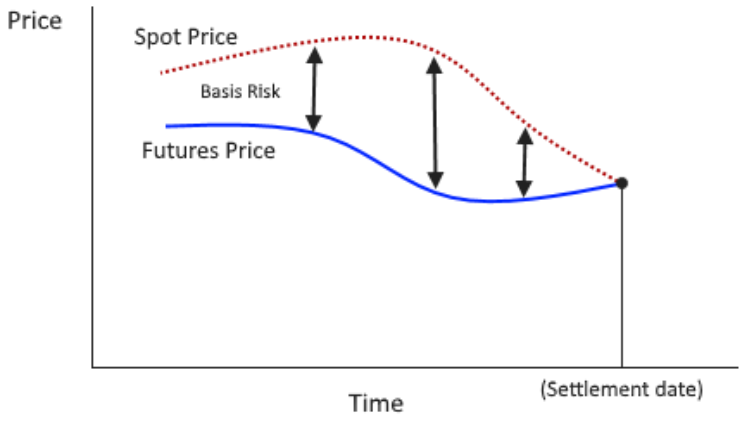
Xplodde does not keep any database and thus registration is not required.

Cost Efficient

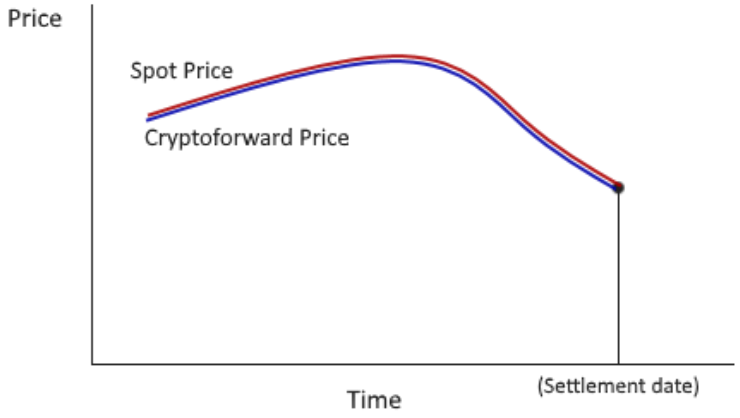
CFs are very cost efficient financial instruments compared to the traditional ones.

Zero Basis Risk

Conventional futures contracts traded on stock exchanges have been very successful for hedging portfolios of currencies, commodities and securities over the last decades. However, one important disadvantage they attach to is they often lead to basis risk. Basis risk relates to the price difference between the traded futures contract and the sport price of the associated underlying asset.



Basis risk is a non-desirable risk because it can produce imperfect hedging for your portfolio. This may happen if a trader needs to close out her position before the settlement date and there is a gap between the sport price and the futures price.



On the contrary, cryptocurrency forwards are basis risk free because their price is all the time pegged to the spot price of the underlying asset. As discussed earlier, a network of oracles (i.e. Federations) is in charge for retrieving real-time market prices and feeding Xplodde's smart contract which executes the settlements of each CF based on such real-time prices. However,

keep in mind you could still not be able to reverse your crypto forwards if you don't find a counterparty matching your needs for reversing.

Easy and effective portfolio Hedging

Crypto forwards are a simple, flexible and overall useful tool for hedging your portfolio of crypto and fiat currencies against market volatility. In an easy way, you can fix currencies' market prices for a period of days, weeks, months, etc. The fact CFs tether real-time spot prices for their price discovery, bearing thus no basis risk, makes them even more attractive for hedging purposes.

#7 Potential risks of trading Cryptocurrency Forwards

Operational risk

It relates to any risk with the failure of applications, systems and processes in respect of Xplodde and associated third-parties' software or applications. For instance, Xplodde employs APIs from digital asset exchanges to get real-time market prices which may be subject to disruptions due to internal or external factors. Because Cryptocurrency forwards are on the blockchain, an instance like this would make any outstanding contract depending on these APIs compute data wrongly, implying thus a potential cost for some contracts' owners. Given blockchain nature and how crypto forwards have been programmed, Xplodde won't have any control over ongoing contracts.

Counterparty risk

It is the risk of the counterparty of your cryptocurrency forward not honouring any amount owed to you. This may only happen whenever a margin call is triggered and your counterparty doesn't top up the balance of his or her account up to the initial margin. In this case, you would receive the full amount of your counterparty's account balance which could be from significantly positive to zero.

Market risk

It reflects any losses arising from market price movements against the cryptocurrencies of your contracts. For example, if you sold a contract on the btc/eur pair and bitcoin price surges it will result in a loss for you.

#8 Cryptocurrency Forwards Trading Examples

The two main reasons to sign a cryptocurrency forward are either speculation or hedging. Speculators seek to find a profit by betting on cryptocurrency price movements in the markets. Because cryptocurrency forwards are leveraged products, any up and down market-price swing is amplified each daily contract's settlement. Note that trading with leverage implies a significant higher risk than without.

Example: *suppose you agree to buy the price difference of a bitcoin with respect to euro for a BTC/EUR 5,000 rate and your initial margin was 10% (i.e. EUR 500). Suppose also at the end of the first day the rate has moved up to BTC/EUR 6,000. Then, your daily gain is EUR 1,000 but you only paid EUR 500 (i.e. you traded with leverage) so your return is 200% (1,000/500) rather than 20% (1,000/5,000). Be aware you will experience an equivalent loss if you were in the sell side of the contract.*

Hedgers, on the other hand, look for hedging a cryptocurrency position in the spot market. Hedgers aim to fix the current market price of any cryptocurrency pair for a specific period. Some may want to avoid market prices going up and others going down, so they prefer to give up any positive gain in the opposite direction to assure certainty about future market prices.

Example: *a company which often buys online products with bitcoins, for convenience, may be concerned the BTC/EUR could go significantly up. If this happened, it would be more expensive to exchange bitcoins for euros whenever it needs to buy more online products with bitcoins in the future. This company can fix the current market rate of BTC/EUR for the period it expects to make online purchases with bitcoins. The company will do so by buying a cryptocurrency forward with Xplodde.*

In contrast, a bitcoin trader has amounted a significant number of bitcoins over the last year from his trading activities. He expects to spend most of his gains in buying products in euros but is worried the market price BTC/EUR could go significantly down. If this happened, he would receive a significant lower number of euros for bitcoins whenever he needs to exchange them to buy more products nominated in euros. He could exchange today most of his bitcoins for euros, but he's not completely happy with this approach since he doesn't know for sure what and when will buy any products and considers more convenient to keep his funds in crypto. This trader can fix the current

market rate of BTC/EUR for the period it expects to buy products in euros. He will do so by selling a cryptocurrency forward with Xplodde.