Bancor Protocol F.A.Q.

BACKGROUND INFORMATION: KEY CONCEPTS

- ## What is the long tail and how does it relate to cryptocurrencies?

  In business, the 'long tail' describes content and products in low demand or with low sales/view volume that, collectively, make up a market share exceeding that of the current top performers combined.

Internet history shows us that with the digital long tail, the accumulation of all niche contributions can be 2–3 orders of magnitude greater than the hits. Think of all the Instagram accounts after the 1000 most followed, or all the status updates beyond the most viral. The most popular YouTube videos with millions of views each, collectively, account for less than 1% of total views on the site.

In cryptocurrency, the potential long tail could point to trillions of dollars in user-generated value when combining all small and niche currencies beyond the few largest. However, for a long tail to emerge in cryptocurrency, the liquidity problem must be solved and technical barriers to creating and managing a currency must be reduced.

- ## What is the ‘Double Coincidence of Wants Problem’?

The Double Coincidence of Wants Problem is a known mathematical challenge which states that it is difficult to find two parties with opposite wants at the same time in order to complete an exchange.

A common example: the inefficiency of barter, in which two sides need to want exactly what the other side is offering. Money was invented as a technological solution to enable barter over time and space, so for example one party can now sell their tomatoes today and come back tomorrow to buy carrots, rather than both parties having to find an exact match of opposite wants simultaneously. Even in the domain of human communication, before the invention of writing, there existed a double coincidence of wants. People needed to meet face to face to share information, whereas writing enables one party to communicate their thoughts on paper and another to read those thoughts even thousands of years later.

- ## Why is there a Double Coincidence of Wants Problem in Asset Exchange?

In the domain of asset exchange, there still exists a Double Coincidence of Wants Problem, as there is no ‘money for money’. Every currency that is exchanged requires two parties with opposite wants to “meet” (even digitally) in real-time, thus requiring speculators and market makers to provide liquidity and facilitate transactions, taking fees along the way and leading to inefficiencies.

Exchanges are an example of a labor-based solution to the Double Coincidence of Wants, as opposed to a technological solution like writing and currency provide for human

communication and barter. As an analogy, it would be as if instead of writing, we had messengers passing the information from one person to another in order to transfer information verbally. Or if instead of money, we had a global marketplace where people directly exchanged their goods & services.

However, with the invention of smart contracts, a new paradigm is possible. Now immutable, decentralized software code can itself hold programmable money, meaning money that holds money. By standardizing smart contracts for exchanging digital assets, Bancor protocol offers the first technological solution to the Double Coincidence of Wants Problem in the domain of asset exchange.

- ### What are Smart Contracts and why are they significant?

Smart contract enabled blockchains, starting with Ethereum, offer the first decentralized software systems in which currencies can be governed by programmable code. This opens the door to diverse customization opportunities previously unimaginable in monetary policy and management.

GENERAL OVERVIEW

- ### What is Bancor?

Bancor protocol is an initiative of the Bprotocol Foundation, a nonprofit organization based in Zug, Switzerland.

The Bancor protocol enables anyone to create a new type of cryptocurrency called a smart token, which can hold (and trade) other cryptocurrencies. This allows the smart token's contract to serve as its own market maker, automatically discovering it's own price(s) and providing liquidity to other currencies, thereby removing the need for a second party in cryptocurrency trades. Every smart token is always liquid at some price point.

- ### What is the problem Bancor is solving?

The Bancor protocol represents the first technological solution for the classic problem in economics known as the "Double Coincidence of Wants Problem," in the domain of asset exchange.

For barter, the coincidence of wants problem was solved through money, allowing people to transact asynchronously, over time and space. For money, the existing exchange model relies on the labor of market makers providing liquidity, as represented by an order book which creates market depth. This requirement for labor creates a *barrier-to-liquidity*,

meaning that some threshold of trade activity level is required in order to retain high liquidity at the market price. This barrier-to-liquidity particularly affects small cap, custom, lightly traded currencies, such as community currencies or small business loyalty points, as examples.

The Bancor protocol proposes a new solution that removes the barrier-to-liquidity by employing an asynchronous price-discovery model enabled by asset-holding smart tokens. Smart tokens are always purchasable and sellable for the token(s) they hold in reserve. The continuous liquidity of smart tokens removes the barrier-to-liquidity and enables the emergence of the long tail of user-generated currencies. This could lead to a democratization of value creation, similarly to how blogs democratized publishing and YouTube democratized broadcasting.

Beyond enabling the long tail of cryptocurrencies, the Bancor protocol mechanism of intrinsic reserve currencies coupled with the ability of the smart contract to issue and liquidate smart tokens, also holds profound implications in use cases where the goal is not to create new credit (as is the case with most new cryptocurrencies) but rather to enable the exchange of existing currencies without a counterparty or orderbook (see “Token Changers”) or to enable the direct ownership of currency baskets, or index funds, without counterparty risk (see “Decentralized ETFs”).

- ## What is a smart token? And how is it different from a regular ERC20 token created on Ethereum?

  Smart tokens are compatible with the ERC20 standard and can be used by any software that supports this standard, such as Ethereum wallets. However, smart tokens offer additional functionality not available to regular tokens. Each smart token holds a reserve balance in one or more other ERC20 tokens, thereby enabling anyone to exchange between itself and any of its reserve token(s). The smart token’s smart contract issues new tokens (expanding the supply) to anyone who purchases it with any of its reserve tokens, and withdraws tokens from the reserves (contracting supply) for anyone choosing to liquidate the smart token. The price of a smart token vis-a-vis any of its reserve tokens is calculated as a ratio between the current smart token’s supply and its reserve balance, at the pre-set CRR (Constant Reserve Ratio.)

  Please read our white paper available on the Bancor website for more detailed information about these formulas and their proofs. Essentially, a smart token’s price will always strive to balance supply and demand for the smart token, meaning that when it is being purchased, the price is climbing, and when it is being sold, the price is dropping, in relative proportion to the respective transaction sizes.

- ## What are some of the use cases for smart tokens?

  There are so many potential use cases for the Bancor protocol and smart tokens that it is similar to asking what are the use cases of Ethereum. It's improbable that we could imagine all of them, but there are some of our favorites:

  - Complementary Currencies: Communities can benefit greatly from creating additional units of credit and encouraging collaboration on the local level. These currencies don't necessarily replace national ones, but rather complement them, filling in pockets where liquidity may be missing or commerce takes place entirely locally, thus freeing up the national currency for other uses. Giving communities access to a tool they can use to efficiently buy and sell goods and services from trusted members creates real abundance for families, students, affinity groups and the cash constrained. This same use case works for online group currencies. You can read more about community currencies online and find lists of active communities, many of which are evaluating the Bancor protocol for adoption.

  - Business Loyalty Point Programs: Whereas individual businesses struggle to make their custom loyalty programs sticky enough for customers, issuing smart tokens which can also be exchangeable to other tokens in other networks creates tremendous value for customers who can now access many more items. This creates additional stickiness, and strengthens cooperation between businesses.

  - Token Baskets (i.e. decentralized ETFs or Index Funds): Created via the Bancor protocol by setting the smart token's total CRR to 100%. This means your smart token can represent any combination of other tokens or tokenized assets, creating a decentralized, organically-balanced token basket, owned directly by its holders. For example, your smart token can hold 50% Augur REPs and 50% BCAP in its reserve, and its price will track the relative changes in Augur and BCAP values through arbitrageurs.

  - Content Creators: Artists can also create smart tokens that serve as the method to purchase their work or attend a show. These smart tokens serve as their own distribution medium (so the artist & buyer don't pay a commission to any middleman), can be easily exchanged between people, and can be set up such that the price will rise as demand rises.

  - Crowdsales: Anyone can use the Bancor protocol to create always-liquid tokens not dependant on any exchange. Your token will be liquid from day one while still remaining compatible with the architecture of all existing cryptocurrency exchanges. By using the Bancor protocol, new altcoins can achieve greater market depth than what is typically provided by exchanges, even for the largest of cryptocurrencies, by essentially pooling all the liquidity that would normally be

spread across many exchanges into a single, “global-exchange” provided by the smart contract (through its reserve). The result will be lower price volatility for customers without any counterparty risk.

- Token Changers: By creating a smart token (similar to a token basket) with 100% CRR and multiple tokens in reserve, you enable anyone to instantly exchange one reserve token for another. Unlike a token basket, whose purpose is to serve as an index fund for those wanting to take a position across multiple currencies, the purpose of token changers is to exchange one token to another. A network of token changers results in something akin to a decentralized Shapeshift, where users can come to exchange any currency on the Bancor network for any other. Since Token Changers can charge fees for their conversion services, anyone who wishes to provide liquidity to the token changer (rather than just convert one token to another) gets to participate as a part-owner in a crowdsourced exchange, enjoying their pro-rata of the fees taken by the Changer for its automated conversion services (and accrued to its reserve, thereby appreciating the smart token’s value). Software companies building online wallets for tokens can now offer exchange services directly inside their applications and open up a new revenue stream overnight.

What we’re most excited about is the innovation we’ll see from the community. Historically, long tails are formed when barriers to entry are reduced. Bancor is enabling anyone to create a viable value network in their image. There are hundreds of thousands, even millions of potential digital currency entrepreneurs out there, and they will teach us about the power of the protocol and the platform.

Who’s behind Bancor?

The team behind Bancor is built of serial consumer Internet technology entrepreneurs with decades of experience working together, raising venture capital, growing companies to Internet scale, bringing products to market, reaching critical mass, mergers and acquisitions, and even a few wind downs. Some of our companies included Contact Networks (one of the first social networks in 1998 and an inspiration to Plaxo and later Facebook), MetaCafe (the largest user-generated video sharing site before YouTube with over 50 million active users), Mytopia (the first developer of multiplayer games for PDAs and Smartphones), Particle Code (a cross-platform development environment for mobile and web applications) and AppCoin (a pioneer in digital community currencies with over a million real item transactions logged.) Venture funds that we have worked with or raised from include Founders Fund, Accel, Benchmark, Highland Capital, Trinity Ventures, SK Telecom Ventures and more.

Since discovering Bitcoin in 2011, we have been fascinated by the parallels between blockchain and the Internet, and the implications for society of user-generated currencies.

We've spent years piloting community currencies and deeply understanding the barriers to unlocking the long tail in the Internet of Money. The Bancor protocol is our solution to the fundamental liquidity challenge we discovered time and again, and has gone through years of incubation, refinement and review with industry and academic experts. You can read more about our team members on our website.

- Where's the team based? Have you built other projects in this space?

  The Bprotocol Foundation is a Swiss non-profit organization, headquartered in Zug, Switzerland. The Foundation has a research and development center based in Tel Aviv, Israel.

  Our team has been involved in the blockchain ecosystem in Israel since 2011, co-organizing the first meetups in the country, incubating the MasterCoin Foundation in our offices, including hosting their first hackathons, all in attempt to push forward the infrastructure for a diverse currency platform. We have been developing and deploying our own user-generated currency solutions since 2013. The Ethereum smart contract protocol provided the much needed decentralized platform for user-generated programmable currencies (tokens) that inspired us to design the Bancor protocol.

  Previously, our team members have built end-user Internet applications that were used by tens of millions of unique monthly users, and have been pioneering new digital user-experiences in gaming, video and commerce since the early days of the Internet.

ABOUT THE BANCOR PROTOCOL

- How does the asynchronous price discovery work?

  Asynchronous price discovery: the ability of a smart token to discover the price of itself or its reserve tokens without having to match a buyer & seller in real time.

  Smart tokens use a simple calculation to reprice the token any time it is purchased or liquidated through its smart contract. This is done by holding the pre-set CRR constant and adjusting the price to reflect current smart token supply and reserve balance. The token supply increases with purchases (new smart tokens issued to buyer in exchange for a reserve token) and contracts with liquidations (smart tokens returned to and destroyed by the contract in exchange for tokens from the reserve.) The price increases when the token is purchased, and decreases when it's liquidated. Over time, the price will stabilize at the point of balance between the purchase and liquidation volumes. You can see the precise formulas and mathematical proofs in our white paper available on our website.

- ## How is a smart token’s price calculated? What is a CRR?

  The CRR (Constant Reserve Ratio) is a parameter, set by the creator of the smart token for each of the smart token’s reserves. The CRR is a key parameter used by the smart token as an asynchronous price discovery mechanism, as it determines the ratio between the reserve balance and the smart token’s calculated market cap.

  For example, a CRR of 10%, for a 100 ETH reserve balance, would price the smart token according to a 1,000 ETH market-cap (with each smart token being priced as this market cap divided by the number of smart tokens in supply, initially configured by the creator, and then dynamic with market buys and sells). Whenever the smart token is purchased, or liquidated, the reserve balance increases or decreases, and so does the total smart token supply. The result is that for a smart token with a CRR smaller than 100%, any purchase of the smart token will lead to a price increase, while any liquidation will cause a price decrease. This mechanism constantly readjusts the price toward the point of equilibrium between the purchase and liquidation volumes. Price changes are also proportional to transaction size, so a larger purchase or liquidation will affect the price more significantly than a small one. You can read more about these mechanics and formulas in our white paper.

  Below is an excerpt from our ELI5 (Explain it to me Like I’m 5) description description on Reddit:

  > So picture a Smart Token with <100% CRR (Constant Reserve Ratio) like a little robot you’ve created. The robot has two (or more) wallets. One wallet is full of an asset (let's choose ETH for this example). The other is a bottomless wallet of a new asset we're dubbing the smart token.
  >
  > When you create the robot, you give it a CRR. This is the percentage of total value that the robot assigns the total-individual-value of each of its wallets. It will use this CRR (which is a % between >0 and 100) to determine the price of new smart tokens.
  >
  > Here's how. Let's say the CRR for this Robot is 20% ETH and 80% of a new smart token called NewCoin (of which there are currently 100 in existence out in the world). If it has 1000 ETH in its wallet, the cost of 1 NewCoin is...
  >
  > Market Cap = Reserve Balance / CRR = 1000 ETH / 0.2
  >
  > So Market Cap is 5000 ETH
  >
  > Price of NewCoin = Marketcap / Supply = 5000 / 100

1 NewCoin= 50 ETH

Now there is a larger reserve balance of ETH, thereby increasing the price of NewCoin for the next buyer.

The next NewCoin would cost (1050/0.2)/101 = 51.9802 ETH

- What happens if a user tries to instantly liquidate a percentage of the smart token supply that is larger than the CRR?

  Whenever a user purchases or liquidates a smart token, the actual price is calculated according to the transaction size. The reason for this is that the Bancor protocol uses a specific function which takes into account price changes that would have occurred if the transaction were split into infinitely small pieces. Liquidating a high percentage of the supply would cause a substantial price decrease (since each incremental liquidation puts downward pressure on the price) and this decrease is taken into account in current transaction pricing. This ensures that the reserve balance will never run out, and that the CRR will always be maintained. This also helps avoid manipulation by large players (by making it much more expensive to do so) that is so common in today's exchange model.

- Does the Bancor protocol price discovery mechanism add to the price volatility, compared to crypto-exchanges?

  On the contrary. By holding a reserve balance which preserves a constant ratio to the market-cap, the price volatility of smart tokens is not subject to the current market depth since the reserve functions as a predictable and controlled alternative to the traditional order book which normally provides market depth. We've seen that regular exchanges generally hold around 1% market depth, meaning that any smart token with a CRR above 1% could be relatively more stable.

COMMON QUESTIONS

- How is the Bancor protocol different than how cryptocurrencies are exchanged today?

  Cryptocurrencies today are typically traded in classic exchanges which can choose to list them based on their expected trading volume. They use a bid-ask model where two parties with opposite wants must be matched to each other in order for a transaction to occur.

  The Bancor protocol enables smart tokens to be continuously liquid through their smart contract (exchangeable for their reserve currency at an algorithmically calculated price)

and thus do not rely on exchanges for liquidity or price discovery. Smart tokens are purchased directly from their smart contracts, not from sellers, and are liquidated through their smart contracts, rather than through buyers.

- ## How can existing small market-cap tokens benefit from Bancor?

  Small market-cap and lightly traded tokens will benefit greatly from the Bancor protocol, which offers a simple and practical solution to the current liquidity problem they face.

  Illiquid tokens are practically disconnected from the greater economy, rendering them less useful to their holders and thus diminishing their value, further limiting adoption. Some examples of these may be local currencies (for a specific geographic location), group currencies (for a club or community), loyalty points (for individual business or networks of businesses) and crowdsale tokens (for a project or initiative).

- ## Is Bancor for developers only, or for end-users as well?

  Bancor will launch a user interface that enables anyone, regardless of technical skills, to easily create and manage a fully functional & fully liquid smart token for any purpose.

  A desktop/mobile web interface, integrated with popular messenger chatbot platforms will provide simple on-boarding as well as all the basic functionality needed for using user-generated tokens.

  Bancor is also integrating its protocol with leading software developers and exchanges in the cryptocurrency space to bring the power of smart tokens directly into other popular and important applications and services.

- ## Why would a company doing a crowdsale devote a portion of their proceeds to creating the reserve for a smart token, instead of keeping all the funds for themselves?

  Research has shown that assets can gain in value just for being liquid. Guaranteed liquidity has significant benefits to asset holders and this assurance is likely to encourage participation in the crowdsale. As for usage, in both community currencies and loyalty points alike, liquidity is a major driver in adoption and retention, and allows users to move in and out of the network easily, encouraging them to join in in the first place. This is similar to how many people will accept USD knowing that they are easily tradable for other assets, even if they don't plan to trade them. There is peace of mind in liquidity, and this trust building can be the difference between a new token taking off or struggling to prove its worth.

  Having said that, the smart token creator does not need to devote these funds to the reserve forever, since it is possible to set a smart token with an adjustable CRR (within a

pre-set range) that would allow the issuer to withdraw some of the reserve as the smart token user base grows (and its market-cap and organic liquidity, with it).

The reserve can actually be seen as a temporary deposit, and in some cases, as a future source of additional funds (when the issuer decreases the CRR).

For the long tail of user-generated currencies that will not have a high enough trading volume to find counterparties and be easily tradeable, there is no current alternative to achieving liquidity. Bancor is the only technological solution for the Double Coincidence of Wants problem in asset exchange. We believe the benefits of endowing a new smart token with a reserve far outweigh the cost of the reserved liquidity.

- ## How can the Bancor protocol be used for creating something that works like a decentralized shapeshift for all currencies (aka how do token changers work?)

  Token changers are smart tokens with two or more tokens in reserve, totaling 100% CRR between them. Their purpose is to allow you to instantly trade any currency on the Bancor network with any other currency on the Bancor network.

  Token changers can have fees, or can be free, as configured by the creator.

  A token changer that has a fee of 0.1% means that every time someone uses the token changer to facilitate an exchange between its reserve tokens, 0.1% of the tokens exchanged will be kept in the smart token's reserve.

  As with any smart token, anyone can purchase a stake in token changer. Owning a token changer with a fee is similar to owning a share in a mini-exchange. The value of the tokens grows with each fee paid (as it accumulates to the reserve, putting upward pressure on the price algorithm). It is possible to liquidate the tokens at any time to cash in the investment.

  Users may still gravitate towards fee-taking token changers over no-fee token changers because they are likely to have greater market depth (more people will want to provide their liquidity, via the reserve tokens, to a profit generating smart token) and are thus likely to have lower price fluctuations, making it possible that the end user will actually get a better exchange rate when using a token changer that charges fees.

  Bancor’s algorithms and price-discovery UX will assist users in selecting which token changer they should use at any given time to achieve their goals.

- ## How can the Bancor protocol be used for creating decentralized and trustless token baskets (aka ETFs)?

  Smart tokens can hold multiple reserves, each with an independent CRR (Constant Reserve Ratio) setting. A token basket can be defined as a smart token with two or more reserves, totaling 100% CRR. A basket, like any smart token, can be purchased for any of its reserve tokens, as well as liquidated in exchange for any of them. When the basket is purchased with one of its reserve tokens, the price of the basket in *that* token increases, and decreases in the other reserve tokens. This behaviour creates an incentive for arbitrageurs to rebalance the token basket, in cases where the calculated prices differ significantly from outside market prices.

  Token Baskets can also be used as token changers (with or without fees).

- ## How can existing tokens benefit from the Bancor Protocol?

  Any ERC20 token (smart or standard) can be set as a reserve token. While it may be challenging to migrate some existing tokens to the smart token (Bancor) protocol (e.g. tokens with a fixed supply), it is still possible to connect these tokens to the Bancor network by using them as one of the reserve tokens in a token changer. This would enable buying and selling of the existing token with no need for a counter party. Furthermore, it may be good for existing tokens to see increased demand stemming from their usage in the reserve of (smart) token changers.

- ## Can smart tokens be traded on crypto-exchanges?

  Yes, as smart tokens are ERC20 compatible, they can be traded anywhere. However, smart tokens do not *need* to be traded in a crypto-exchange in order to achieve liquidity and facilitate price discovery, as these are directly handled by the smart token's contract using the Bancor protocol for continuous liquidity and algorithmic pricing.

- ## Do you have plans to support non ERC20 tokens such as BTC, XMR, etc? Could the Bancor protocol be used across different blockchains?

  Yes. In the short term, this can be achieved through asset tokenization (with the inherited counterparty risk) or federated two-way pegs (with much smaller counterparty risk). This means that 3rd parties are safeguarding the assets in other cryptocurrencies, while issuing Ethereum tokens to represent them. Those tokens can be exchanged back to the original asset (cryptocurrency in this case) at any time. These tokenized (ERC20) assets can be used as token changer or token basket reserves.

  Longer term, we are tracking solutions for cross-blockchain interoperability (such as Cosmos and Polkadot) and plan to ultimately ensure the Bancor protocol is a universal, blockchain agnostic solution for continuous liquidity.

THE BANCOR NETWORK TOKEN (BNT)

- ## What is BNT?

  The BNT is the Genesis smart token to be deployed, establishing the BANCOR network, functioning as its native currency. BNT will hold a reserve in ETH.

  BNT will be issued in a crowdsale. The crowdsale proceeds will be used to deploy and continuously evolve a user-friendly web/chatbot interface for issuing and using tokens in the BANCOR network, to support various efforts for growing the network such as investing in the reserves of new tokens, and to make the initial deposits required to set up a new type of high liquidity decentralized token exchange network based on the Bancor protocol, using 100% CRR token changers.

  All smart tokens issued within the Bancor network will hold BNT as a reserve (though they may also hold additional reserve tokens.) This means that an appreciation in the value of any of the network's smart tokens will appreciate the value of BNT, benefiting all other smart tokens in the BANCOR network, since their reserve balance value will increase.

  BANCOR will also be used as a reserve for the token changers that make up its decentralized exchange network. A Bancor token changer is basically a smart token that holds a 50% CRR reserve in BANCOR, and 50% CRR reserve in an existing, standard ERC 20 token (e.g. REP, GNT, RLC) allowing end-users to easily convert between the two buy buying the smart token with one reserve token and selling it for the other. In the future, Bancor plans to support additional tokens as well.

- ## Why not just use Ether as the network token? / Couldn't someone just fork the Bancor protocol and use a different network token?

  Using Ether as the network token for the Bancor protocol can be compared to using the Bitcoin currency for Ethereum instead of Ether. Using BNT as the default reserve currency of the Bancor network carries with it a few key advantages:

  1. Network Effects: The more smart tokens that use BNT in reserve (which will be the default setting for smart token creation in any Bancor developed or financed software service), the more valuable and more in-demand the BNT becomes. As the value of BANCOR rises, so too does the value of every smart token holding BANCOR in reserve. And, because we're both the most knowledgeable about the technology behind the Bancor protocol and have first mover advantage in building on it (including over a year working with a large developer team on building the first Bancor software service UX, seeding token changers, high-potential community currencies, and popular token baskets with BNT), anyone forking

would need the economic incentive and the ability to surpass what we've built, or else will have created an inferior network with little incentive for others to use it. (This can be compared to Ethereum, where the success of any solution that uses ETH appreciates Ether value, benefiting the entire Ethereum network).

2. Incentive for Early Adopters: Just as with any cryptocurrency, the initial contributors so that they can see their contribution rise in value as the protocol is built and grows. Without this incentive, it would be a challenge to support Bancor's development and growth, as well as to obtain the required reserve deposits in order to enable BANCOR to function as a continuously liquid decentralized exchange for popular ERC20 tokens (based on smart token changers, as detailed in the whitepaper and in various FAQs in this document). Linking popular tokens to the Bancor network (via token changer or token basket reserves) is expected to dramatically increase the usability and value of the network.
3. Additionally, there are no real advantages to using ETH as a reserve token, since it is exactly as liquid as BANCOR (which holds ETH in its reserve). In fact, the only reason to use ETH as a reserve is if the token creator predicts that the BANCOR value will depreciate in the long term relative to ETH, which will only happen if BANCOR usage is declining for some reason (making it an odd choice for anyone to issue a smart token based on the Bancor protocol).

FREQUENT MISCONCEPTIONS

- ### Isn't Bancor just a decentralized exchange?

  Bancor is not an exchange. It is a protocol which allows for asynchronous price discovery and continuous liquidity. This means that converting a smart token does not require matching two parties in real time with opposite wants, rather, it can be completed by a single party directly through the token's smart contract.

  So, unlike exchanges where you have to find someone who actively wants to buy what you're selling, smart tokens are always completely and immediately liquid regardless of trade volume. This enables a long tail of countless potential currencies that normally couldn't achieve liquidity because their trading volume is too low or their use is too specialized. Smart tokens built using the Bancor protocol form an interconnected monetary network that instantly facilitates any request to convert between tokens in the network.

- ### If people start creating new tokens with less than 100% CRR isn't this like allowing anyone to create their own money? Isn't that a problem?

  Money can be seen as a technology for collaboration. It works by distributing mutually agreed upon units of credit, and helping groups keep track of who did what for who and

how much. Throughout history, there have been many methods in which the initial credit has been distributed (and removed from circulation.) Gold is distributed naturally, bank-notes are extended as loans, and cryptocurrencies are typically issued through crowdsales, PoW, and PoS mining.

By democratizing the creation of new, liquid tokens - a variety of policies can be implemented by different groups across different geographies, thus decentralizing the process by which new credit is extended, allowing for a diverse variety of value ecosystems.

This can be compared to the way the Internet is structured; while protocols are agreed upon (HTTP, TCP/IP, etc.), each network (e.g. ISP) may adopt a different business model, usage policies and backbone technologies.

A decentralized and interconnected monetary model can achieve higher agility, stability and access to credit, which we believe is not a problem, but a solution. We expect to see a tremendous amount of innovation and creativity, and most of all -- real value for end-users.

- ## How can the market-cap of a smart token be higher than the total value of the reserves?

  For tokens with a 100% total CRR (token changers and ETFs), the value of the smart token is equal to the value of its reserves.

  However, for tokens with <100% CRR, the token's value is greater than its reserve value. There are many examples of valuable user-generated currencies that hold no reserves, such as loyalty points (airline miles), local currencies (Ithacash), and protocol tokens (Augur's REP and GOLEM), and yet have a market cap or perceived value greater than 0. In all of these examples, new "credit" is issued, which is accepted by other parties in exchange for goods and services. The value of these currencies is derived from the willingness of other parties to accept them and not from any underlying assets.

  The reserves held by smart tokens are a mechanism which enables them to provide continuous liquidity and asynchronous price discovery. Nevertheless, the token itself must be intrinsically valuable for whatever purpose it serves. The reserves are not the source of the smart token's value. Rather, they are a requirement to operate the mechanism which ensures their liquidity.

- ## I've heard about tokens which are backed using a 150% or even 200% reserve, how could a 10% reserve be enough?

  Some tokens are designed to be pegged to the value of external assets (such as TETHER), and in some implementations, these tokens use a > 100% reserve, combined

with price oracles, as a mitigation strategy for the counterparty risk introduced by this model (aka “Stablecoins”).

The reason for holding > 100% reserves is that the value of the pegged asset (e.g. USD), might increase relative to the backing asset (e.g. ETH), in which case the reserve ratio is reduced, but as long as it is higher than 100%, the pegged token remains fully backed.

These types of tokens serve a very different purpose (representing external assets on blockchains while minimizing the counterparty risk.) In Bancor’s case, the reserve tokens serve as a mechanism to provide liquidity and price discovery, not as the backing of the smart token’s value. Therefore smart token reserves can be set anywhere greater than 0% and up to 100%. This allows token creators to create new value while benefiting from continuous liquidity and automated price discovery, from day one, before the smart token has had a chance to accumulate trade volume, thus significantly lowering the barrier to liquidity and enabling the long tail of user-generated currencies to emerge.

- ### Using a new model for price discovery sounds risky. Why do you think it will work?

  When it comes down to it, the market price in both the traditional model and Bancor’s represent the equilibrium point between buyers and sellers at any given moment. In both models, a buyer’s market will drive prices up, while a sellers market will drive prices down. This common incentive alignment mechanism is the key for market price discovery and why we believe Bancor’s asynchronous price discovery model will function properly. What makes Bancor’s model different is that it doesn’t rely on trade volume for price discovery, but rather sets prices by maintaining a ratio between a reserve and the token’s supply, which can function effectively even at very low trade volumes.

ETHEREUM AND OTHER BLOCKCHAINS

- ### Are there any technical limitations for using Ethereum?

  Ethereum is quickly becoming a platform for tokens, and the Bancor protocol expands the functionality of ERC20 tokens through EIP 228, Bancor’s “Token Changer” improvement proposal. We've found Ethereum to be a solid, comprehensive platform to work with and useful for implementing everything we need to effectively launch the Bancor protocol. We have encountered some challenges, such as implementing advanced math functions, but nothing we couldn’t work around and that couldn’t easily improve in the future. Additionally, based on the proven ability of the Ethereum foundation to guide the evolution of the Ethereum blockchain over the past couple years, as opposed to the stagnation of the Bitcoin blockchain with its never ending in-fighting, we believe the future is bright for ETH and are excited about building a comprehensive liquidity solution for the ecosystem, and eventually connecting it to others.

- ### Doesn't the DAO hack mean Ethereum is not secure?

  No. However, it does mean that smart contracts should be professionally audited before they are deployed, and that additional protections should be implemented in the smart contracts in case an issue is discovered after their deployment. Since the DAO hack, several best practices have evolved in the industry to increase the security of newly deployed smart contracts, and Bancor utilizes these to ensure the security of our smart contracts as well. We're also implementing multiple redundancies to safeguard against unexpected scenarios.

COMPARING BANCOR TO OTHER TECHNOLOGIES

- ### How does Bancor compare to 0x?

  0x is a next-generation decentralized exchange that aims to solve some of the scalability and cost challenges of current decentralized exchange solutions. Unlike Bancor, 0x uses the classic exchange model of matching bid and ask orders to facilitate transactions between two parties. The Bancor protocol works differently than the existing exchange model since it does not require matching two parties in order to facilitate an asset conversion transaction, thus enabling continuous liquidity for assets at any time and scale.

- ### How does Bancor compare to Makerdao?

  Marketdao is creating a stable and collateralized cryptocurrency. This means that the value of the DAI currency issued by Makerdao is pegged to a basket of international currencies (SDR) reflecting the actual costs of goods and services in major economies. Being collateralized means that collateral is being maintained for the DAI currency, effectively backing it. This is quite different than smart tokens, where the reserves are not collateral backing the token, but rather used as liquidity pools, essentially providing an alternative to market depth for this currency in different exchanges.

- ### How does Bancor compare to Shapeshift?

  Shapeshift is providing a simple solution for exchanging cryptocurrencies, where the user sends cryptocurrencies/tokens to an address, and receives a different currency in return. While Bancor token changers provide a similar experience, the backend is quite different as ShapeShift is using a more classic exchange infrastructure while with Bancor, smart tokens are using the reserve mechanism for algorithmic pricing.

- ### How does Bancor compare to Melonport?

  Melonport is a platform for creating “user-generated funds”, meaning that they are simplifying the process of creating a smart contract based investment vehicle which is managed by a specific party. Melonport also provides a mechanism which allows for performance comparisons between different funds.

  The only use-case of Bancor which has some similarities to Melonport is the token baskets. Token baskets can be managed, meaning that their owner can update the reserve list and CRRs from time to time, as well as unmanaged, meaning that the token basket keeps the same set of assets and ratios indefinitely.

- ### How does Bancor compare to EtherSwap / CryptoDeriviatives?

  EtherSwap and CryptoDeriviatives essentially provide open market orders on the Ethereum network. Using smart contracts, anyone can offer to swap tokens for ETH at a predefined exchange rate. This means that there are still two parties that are involved in the process, which is quite similar to the matchmaking process that takes place in classic exchanges. Additionally, no organic or automate price discovery takes place.

- ### How does Bancor compare to Cosmos/Polkadot?

  Cosmos/Polkadot and Bancor are quite different, and very synergetic! Cosmos & polkadot plan to launch solutions allowing different blockchains to interoperate. By using these (or similar) technologies, the Bancor protocol will operate across multiple blockchains, rather than just on Ethereum. We are super excited about the opportunity to enable Bancor to connect between every kind of asset on various and diverse blockchains, and believe that this wider coverage will contribute greatly to the value and potential of the Bancor protocol moving forward. We will seek to collaborate with these and other interchain solutions. If you come across any we should evaluate, please let us know.

Miscellaneous

- ### What are edge cases where runs on the bank can happen to smart tokens? Are there any protections against this?

  Yes, the CRR is the main protection since the way the price is calculated assures that the reserves can never be drained. The price will drop in such scenario, providing a potential opportunity for those who are not liquidating.

- What are the implications of selecting a higher or lower CRR?

  A higher CRR will cause the price to fluctuate less with any buys and sells of the smart token. This means that given the same market-cap and transaction size, the price increase (or decrease) following a purchase (or liquidation) will be smaller as the CRR is larger. Intuitively, a larger market depth is more resilient to changes in supply.

- Why did you name the project Bancor?

  The name is in honor of the Keynesian proposal to introduce a supranational reserve currency called Bancor to systematize international currency conversion after WWII. The proposal was introduced at the Bretton Woods conference where delegates from 40 countries gathered to establish the new financial world order.

- How will the market cap of the BNT be measured/increase?

  Like any other currency, the market cap is the supply of the token multiplied by its unit price. As more smart tokens are created, using BANCOR as (one of) their reserve token(s), growing demand will put upward pressure on the unit price of BANCOR. In addition to end-users, those wishing to participate in Bancor's network growth and associated value increase may be inclined to own BANCOR thus further increasing demand.

- Why wouldn't token creators just use exchanges insteads of allocating valuable funds to a reserve?

  Being listed on an exchange involves being registered, verified and approved by exchange owners. Buyers and sellers and then subject to all sorts of limits by the exchange, depending on jurisdiction and other business model considerations. Needless to say, these exchanges also charge fees, often high ones. With Bancor, all a smart token creator needs to do is deposit (or crowdfund) ETH into the smart token's account, and it is instantly tradeable. Additionally, the available liquidity is also spread between the different available exchanges, making market depth more shallow (and price volatility higher) in each one. With Bancor, all the available liquidity exists in the same liquidity pool, the smart token's reserve, directly in its smart contract.

Glossary of Terms

Term	Definition
Bid-Ask Spread	The difference between the lowest price a seller is willing to sell an asset for, and the highest price a buyer is willing to buy an asset for.
Counterparty Risk	The inherent risk that is present in any dealing with another human: that that human/institution will not honour their part of the deal.
CRR (Constant Reserve Ratio)	The CRR (Constant Reserve Ratio) is a parameter, set by the creator of the smart token for each of the smart token's reserves. The CRR is a key parameter used by the smart token as an asynchronous price discovery mechanism, as it determines the ratio between the reserve balance and the smart token's calculated market cap.
Double Coincidence of Wants	The problem of finding someone who wants what you have to sell and has what you want to buy, in real-time. The invention of money was the solution to this problem in barter. The invention of Bancor is the solution to this problem in asset exchange (aka the barter system of money, or money for money).
ETF (Exchange Traded Fund)	Meta-fund (fund of funds). Traded on stock exchange. Low maintenance & less centralized than mutual funds. Most popular class of asset traded worldwide.
Fractional Reserve Banking	When you receive X money, you hold X-Y (the percentage Y of X is the "Reserve Ratio") & loan out Y, ad infinitum. Is is most commonly used by banks.
Liquidity	The ability for an asset to be easily bought and sold. High liquidity = Selling one popular cryptocurrency for another. Can be done cheaply in <1 minute. Low Liquidity = Selling a house. Takes a lot of time, effort, and money to find a buyer who wants your house at a price you can accept.
Long Tail	The large amount of content/products that are in low demand that, collectively, make up a market share that is greater than that of the combined top performers.
Market Depth	The amount of an asset that is currently available to be traded.
Market Maker	An entity that puts up an order to buy/sell an asset at a given price.
Price Discovery	The process of buyers & sellers coming to an agreement on the price of an asset. Normally this happens by matching bids and asks in an exchange. Bancor uses an algorithm based on reserves.
Smart Contract	A program run on a blockchain (and therefore unchangeable w/o record & irrefutable). Can give an object autonomy, so that it can run code, make & accept payments, and own itself and other assets.