



A E N I G M A
CAPITAL

Crypto Investment Fund

Republic Protocol

Wesley Pryor, CPA
Mazin Hamad

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Investment Thesis

Ænigma has a bullish outlook on Republic Protocol for three reasons. First, the number of dark pools in the digital asset realm will accelerate as institutional investors enter the market and seek to buy and sell in large blocks. Second, Republic Protocol's liquidity provider incentive program encourages OTC desks to use the protocol and build dark pools on top of its platform. Third, RenEx, Republic Protocol's proprietary exchange, is the only dark pool exchange that is both decentralized and possesses the technology to ensure anonymous user identity and order detail at all layers of a transaction.

The use of Shamir's Secret Sharing algorithm and zero-knowledge proofs creates an environment where only the transacting parties have access to their own identity, order size, and coin pairing. Traders will never have to trust their funds to an exchange, as all transactions are executed by atomic swap after darknodes privately match their orders. Compared to centralized alternatives such as Kraken's dark pool, Republic Protocol will offer higher coin security with atomic swap architecture, lower fees, lower minimum order size, and more crypto pairings for its users.

Dark pools have played a crucial role in traditional equity markets since the 1980s by giving institutional players a private outlet to trade large blocks while avoiding significant slippage and market impact. In 2016, Cowen ATM estimated that dark pools account for approximately 15.0% of all volume in equity markets, with the average trade approximately 200 shares in size. Compared to equity markets, the nascent crypto market offers little liquidity on lit exchanges and could experience higher demand for OTC trading and dark pools. In fact, the TABB Group recently released a study claiming that the OTC crypto market receives 2-3 times as much bitcoin volume as traditional exchanges. With its decentralized dark pool protocol, Republic Protocol is the first player in the space with the technological infrastructure to address this highly profitable market need.

While Republic Protocol stands as a competitor to established OTC desks, it also has the unique ability to leverage these brokers as liquidity partners. Republic Protocol's relationship with OTC brokers may comprise any combination of the following: 1) Republic Protocol competes directly with OTC brokers and captures a percentage of their market cap, 2) Republic Protocol partners with OTC brokers to pool liquidity on RenEx and open fiat-to-crypto pairings to new investors, or 3) OTC brokers create their own exchanges using Republic Protocol. Each option is a net positive for Republic Protocol, with options 2) and 3) presenting the largest potential upside. Per its recently announced partnership with Wyre, Republic Protocol has already begun executing strategic alliances with OTC trading desks. Wyre will migrate trading to Republic Protocol as available currency pairs permit. As an added benefit, Wyre will also implement its KYC compliance on RenEx. In return, Wyre will receive a share to be determined of the liquidity partners' incentive (0.08% of RenEx's total volume).

Republic Protocol is backed by a lineup of heavy-hitting investors that includes FGB Capital, Polychain Capital, and Kenetic Capital. But its headlining investor is crypto giant Huobi, which this past July launched its own Huobi Cloud platform for OTC desks. These investor partnerships with Republic Protocol could signal an intention to use large block or high frequency trading (HFT) as a source of corporate liquidity in the future. As exchanges on Republic Protocol grow in volume, new OTC brokers will have an incentive to pool liquidity and open additional crypto pairings for their customers.

Investment Catalysts:

- Following an impressive testnet, RenEx's Mainnet Beta launched at the end of September 2018. Republic Protocol's 200 testnet darknodes earned an estimated \$21,700 in fees in just over two months. Republic Protocol has also released an update which significantly lowers gas costs for matching orders.
- REN, the Republic Protocol token, has just been listed to Huobi and The Ocean, enhancing its liquidity profile.
- After the public mainnet is launched, Republic Protocol will work toward adding compatibility with additional chains such as LTC.

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Investment Concerns:

- For Republic Protocol to reach its full potential, exchanges beyond RenEx must build on the protocol. To date, no other exchanges have announced such intentions, but we would expect exchange growth after Republic Protocol proves itself as a legitimate player in the dark pool space. Fortunately, the market will be large enough to spread the wealth to multiple dark pools. Even if exchanges such as Binance, Huobi, and Coinbase were to develop their own independent dark pools, our valuation demonstrates that Republic Protocol could still yield a handsome market cap with only a small percentage of market capture.
- Republic Protocol has stated that it will maintain sole responsibility for listing new coins on RenEx. This leaves Republic Protocol susceptible to government regulation of the listing of securities. If new third-party exchanges were built on the protocol, Republic Protocol would be able to create a decentralized listing process more resistant to regulation. Republic Protocol has hinted that its centralized oversight of the listing process may be only a short-term arrangement until the protocol is further developed.
- It is unclear how many darknodes the Republic Protocol team will operate. The founders have sufficient REN to operate 3,000 darknodes, which constitute 30% of the maximum amount of nodes. In the early stages of mainnet, even 1,000 darknodes would likely give the team a majority of running nodes. Running nodes will provide the team with additional revenue for development, but too many would put the decentralized nature of Republic Protocol at risk. Republic Protocol plans to announce the number of nodes prior to the release of public mainnet, such that investors should have a better understanding of darknode distribution and overall node concentration as Mainnet Beta ends.

ICO Details Summary

ICO Date _____ **2018-02-03**
ICO Sale Close Date _____ **2018-02-03**

Token Sale Inputs

ICO Round	Token Price	Tokens Offered (Millions)	ICO Date Token Float (Millions)	Token Lock Up and Vesting
Presale	\$ 0.05232	516	516	No Lockup
Main Sale	\$ 0.05814	86	86	No Lockup
Reserve	\$ 0.00	199	0	No Lockup
Founders, Team, & Advisors	\$ 0.00	99	0	Advisors locked for 6 months, team for 24 months
Early Adopter Partnerships	\$ 0.00	50	0	No lockup
Community Development and Partners	\$ 0.00	50	0	No lockup

Pricing and Valuation

ICO Round	Tokens Offered (Millions)	Raise Amount (Millions)	Token Price	Bonus Token %	Public Sale Discount %	Fully Diluted Valuation (Millions)	ICO Float Valuation (Millions)
Presale	516	\$25.8	\$0.05	20	17	\$50	\$30.1
Main Sale	86	\$5.16	\$0.06	0	0	\$60	\$36.12
OverAll Sale	602	\$30.96	\$0.05	20	17	\$50	

Token Issuance and Release Structure

Token Allocation	Tokens Offered (Millions)	Token Allocation %	ICO Date Token Float (Millions)	Token Lock Up and Vesting
Presale	516	52	516	No lockup
Main Sale	86	9	86	No Lockup
Reserve	199	20	0	No Lockup
Founders, Team, & Advisors	99	10	0	Advisors locked for 6 months, team for 24 months
Early Adopter Partnerships	50	5	0	No lockup
Community Development and Partners	50	5	0	No lockup
OverAll Sale	1000		602	

Links

Twitter	https://twitter.com/republicorg?lang=en	Web	https://republicprotocol.com/
GitHub	https://github.com/republicprotocol	Reddit	https://www.reddit.com/r/republicprotocol/
Whitepaper	https://republicprotocol.github.io/whitepaper/republic-whitepaper.pdf	Medium	https://medium.com/republicprotocol
Facebook	https://www.facebook.com/RepublicProtocol/	LinkedIn	https://www.linkedin.com/company/republic-protocol/
Telegram	https://t.me/republicprotocol		

Project Description & Overview

KPI / Data Point	Source	Analyst inputs/discussion
Project Summary		<p>Republic Protocol is an open-source protocol designed to offer the first decentralized dark pool trading platform for digital assets. The protocol is backed by decentralized community-operated darknodes which will be responsible for discreetly matching user trade orders through the use of Shamir's Secret Sharing algorithm. Darknode operators must stake 100,000 REN per darknode and are entitled to a certain percentage of the fees for the volume that they help to match. The Republic Protocol team is launching RenEx, the first dark pool exchange hosted by Republic Protocol, which will initially offer BTC, ETH, and ERC20 pairings to KYC-compliant users. The use of dark pools allows for minimal slippage when trading large blocks and effectively eliminates the ability of traders to front-run large orders. These qualities make dark pools an ideal solution for institutional investors seeking to enter a highly volatile and underdeveloped crypto market.</p>
Tech		<p>Shamir's Secret Sharing is a cryptographic algorithm which splits a secret into distinct components and only enables reconstruction if one possesses a defined amount of the parts. Mathematically, the concept relies on the fact that a polynomial of degree $k-1$ can be defined by k points. For example, a line (a first degree polynomial) is defined by 2 points. Therefore, one can hide a secret S within a $k-1$ degree polynomial of the form $f(x) = S + a_1*x + a_2*x^2 + \dots + a_{k-1}*x^{(k-1)}$ and distribute n points of the form $(1, f(1)), (2, f(2)), \dots, (n, f(n))$ so that only k points need to be known to reconstruct $f(x)$ and identify S. In the case of Republic Protocol, the secret will be the user identity, coin, and order size, and the points will be encrypted order fragments distributed to the darknodes. Hypothetically, a nefarious actor could try to identify the necessary k amount of fragments to reconstruct the order details, but Republic Protocol has created an Ethereum-based smart contract that orders the network topology in such a way as to make accumulation of the fragments unreasonably difficult to attain.</p>
Market Opportunity/Size	<p>http://www.cowen.com/wp-content/uploads/2017/05/2017-01-23-Cowen-Volume-Liquidity-Update.pdf</p>	<p>Dark pools account for approximately 15.0% of volume in traditional equity markets. Considering that the asset class is nascent and liquidity on lit exchanges is still thin (a by-product of a young asset class), it is not unrealistic that dark pools could account for more than 15.0% of volume in the digital asset market. Investors can receive better pricing for block trades via a dark pool OTC as opposed to lit exchanges, where they would potentially incur significant slippage or have to accumulate over months. Furthermore, there are more retail investors in crypto than in traditional markets, but as institutional investors inevitably enter the space, the demand for dark pools will rise.</p>
Competitive Landscape		<p>Republic Protocol already faces a handful of competitors in the sector and is sure to encounter new challengers as the market develops. However, Republic Protocol has several advantages over existing dark pools and will have a first-mover advantage over any future projects. Therefore, it is not out of the question, and perhaps even conservative, to assume Republic Protocol could capture 2.5% of the dark pool market (0.375% of the total crypto market). There are currently few dark pool options on the market, with Kraken and XTrade being the most popular. Both exchanges offer only BTC-to-fiat pairings, while RenEx distinguishes itself in providing BTC, ETH, and ERC20 pairings. Republic Protocol's decentralized structure also gives its dark pools the same advantages of any normal lit decentralized exchange</p>

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KPI / Data Point	Source	Analyst inputs/discussion
Competitive Landscape (Cont.)		<p>over a centralized lit exchange; namely, that users control their own funds and can trade peer-to-peer without an intermediary. Furthermore, as illustrated by the \$150 million SEC fine levied against Barclays and Credit Suisse over its dark pool operations in 2016, centralized dark pools in traditional equity markets are forced to raise fees to replace lost revenue from government regulation. The decentralized exchanges built on top of Republic Protocol will experience significantly less regulatory pressure than centralized crypto exchanges in coming years.</p> <p>One of the main uses for dark pools in equity markets is the facilitation of HFT. Highly volatile crypto markets can potentially offer HFT firms larger upside. HFT firms such as DRW, Jump Trading, DV Trading, and Hehmeyer Trading have all made recent entrances into the crypto market, but dark pools such as Kraken and XTrade have yet to attract any significant institutional investors. This provides Republic Protocol with a powerful opportunity to become a leader in the space. Given that large hedge funds frequently partake in HFT, Republic Protocol's backing from funds such as Polychain Capital and Kenetic Capital is a strong sign as well.</p> <p>The main competition for Republic Protocol outside of rival dark pools will come from OTC desks such as Airswap. Airswap's purported edge over Republic Protocol is the speed at which an order can be matched. Unlike Republic Protocol, which requires each darknode to check every other darknode to locate a match, Airswap has a lit order book. The matching process on Airswap is more streamlined than the brute force verification used by Republic Protocol, but it does not offer the main feature of Republic Protocol: totally anonymous order details. As such, it is still possible on Airswap and most other OTCs for traders to front-run large orders.</p> <p>While OTC desks represent potential competition, they can also use Republic Protocol to pool liquidity and help facilitate trade matching for their clients. There are already many large OTC desks in the market; Kraken maintains a OTC book for BTC of more than \$500,000 in value per day, Circle is an OTC that averages around \$2 billion per month, and Gemini's block trading feature went live in mid-April. We have already seen OTC brokers such as Wyre partner with Republic Protocol to pool liquidity. Partnerships with Huobi and funds such as Kenetic Capital signal interest by large OTCs and clients in utilizing Republic Protocol as it develops.</p>
Management Team Assessment	https://www.youtube.com/watch?v=XyByVQk5a90	<p>Co-founder and CEO Taiyang Zhang has extensive experience in crypto finance. At university, Zhang specialized in programming distributed systems and leveraged that experience to provide big data support to tech startups. He went on to work for government logistics agencies in software development before founding and directing Virgil Capital, a crypto quantitative hedge fund that specializes in arbitrage trading with approximately \$24 million in assets under management. Zhang's time at Virgil Capital inspired him to create Republic Protocol, as he noticed that there were insufficient OTC alternatives to prevent market impact. He firmly believes that larger crypto OTCs such as Circle and Genesis will use Republic Protocol to pool liquidity.</p>

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KPI / Data Point	Source	Analyst inputs/discussion
Management Team Assessment (Cont.)		Co-founder and CTO Loong Wang attended university with Zhang, focusing on distributed systems as well as developing concurrency mechanisms to make database management systems more efficient. Wang worked with Cray Inc. on their Chapel programming research to make the language more efficient for use on supercomputers. He has also created his own distributed system languages.
Roadmap/Project Progress & Milestones	https://medium.com/republicprotocol/mainnet-roll-out-plan-aa9d4491ff2c	<p>The REN developers are some of the most active on Github; the team ranks 5th in the number of commits ranking for the past six months, just behind projects such as EOS and TRX.</p> <p>Republic Protocol launched its testnet this past June and achieved immediate success. Over a two-month period, the testnet handled 20,000 transactions, 14,000 matched orders, approximately 500 traders, and saw \$21,700 in fees rewarded to the 200 participating darknode operators. A limited Mainnet Beta has launched as of September 2018, with darknodes to be run by the Republic Protocol team during the final testing period. After Mainnet Beta, the public will be able to set up their own darknodes for a fully launched mainnet. The team is also working on adding multi-coin pairing compatibility for mainnet, which would allow traders to sell or buy multiple coins in one order. For example, a seller would be able to offer to sell their BTC for either ETH or REN.</p> <p>The fee structure on transactions is established at the discretion of the exchanges built on Republic Protocol. RenEx will charge 0.2% trading fees to buyers and sellers each. The total 0.4% fee is paid in REN, ETH, or ERC20 tokens, with 20% going to partnered liquidity providers and 80% being evenly split among all darknode operators who helped to match the order. No portion of these fees will go to the Republic Protocol team except those made from the darknodes operated by Republic Protocol. Darknode operators must offer a bond of 100,000 REN per darknode to be added to the network and risk having half of their bond burned if malicious activity is discovered from their darknodes.</p>
Token Economics/ Business Model	https://medium.com/republicprotocol/protocol-upgrades-and-conditions-cb724b1ef246	<p>Key investors: FGB Capital, Polychain Capital, Signum Capital, Hyperchain Capital, Huobi Capital, zero-knowledge, Block VC, ZhenFund, Block Asset, Binary Financial, Kenetic Capital, Signal Ventures.</p> <p>The Huobi Capital investorship is one of the most significant. Huobi has just listed a REN/BTC pairing, but more importantly, this relationship signals that Huobi may be contemplating building their own dark pool exchange on the protocol. Huobi is the fourth largest crypto exchange, with approximately \$1.2 billion in volume per day. An official announcement of involvement would bring attention to Republic Protocol and give the protocol another anchor exchange to complement RenEx.</p> <p>Republic Protocol recently partnered with Wyre, which will provide liquidity and KYC services to RenEx. Wyre has executed more than \$3.5 billion in OTC transactions since 2013 and will be the first liquidity partner to partake in fee-sharing. The implementation of KYC standards on RenEx will attract institutional investors who are not legally allowed to trade without counter-party KYC. Wyre has already completed a near-identical partnership with Airswap which will allow compliant customers in five countries to convert fiat into cryptocurrencies.</p>
Notable Investors, Partnerships or Customers		

Valuation Assessment & Liquidity

KPI / Data Point	Source	Analyst inputs/discussion
Expected Time Horizon	https://medium.com/republicprotocol/republic-protocol-mainnet-beta-launch-657a44e12fcd	Mainnet Beta launched at the end of September 2018 and will yield an early indication of the amount of volume to be expected from Republic Protocol in its infancy. The Republic Protocol team expects to work toward supporting additional chains, including LTC, implementing scaling solutions for atomic swaps such as Lightning and Raiden, providing infrastructure for HFT, and establishing support for OTC brokers. We will monitor early volume figures, gas expenses, and darknode metrics to establish a fair value for the exchange and assess our targets therein.
Price Target & Valuation	https://medium.com/republicprotocol/republic-protocol-testnet-update-d798b7d075f	Republic Protocol's testnet statistics give us a conservative lower bound for the gross profit margins that darknode operators can expect during mainnet. During testnet, the Republic Protocol network received a monthly average of \$3.37 million in volume and \$10,800 in fees paid to 200 darknode operators. Extrapolating Ænigma's own testnet darknode average gas cost of approximately \$133 across the entire network, the network would require a total of \$26,600 in gas costs. However, near the end of testnet, the Republic Protocol team released an update that yielded a 4-10x reduction in gas costs. If a 7x reduction in gas fees had been implemented at the beginning of testnet, total gas costs would have equaled \$3,800. This creates an adjusted gross profit margin of 65%.

Thankfully, during mainnet the Republic Protocol team will not allow darknodes to match orders if gas costs exceed the fees earned, and they will continue releasing updates to optimize gas expenses. However, the 65% profit margin gives us a good lower bound estimate for future valuations. In order to justify REN's current \$18 million valuation given a 65% margin, an estimated 500 darknode operators, and a \$50 average VPS cost (the recommended mainnet VPS has higher specifications than that of the testnet), RenEx would have to yield approximately \$2 million in volume per day.

Forecasting the next two years shows that \$2 million per day is a reasonable volume target. In 2017, \$2 trillion worth of digital assets were traded on public exchanges, and as of the end of Q2 2018, roughly \$4.5 trillion had been traded for the year. Assuming an end-of-year total turnover of \$8 trillion, our conservative assumption is that total public volume could reach \$15 trillion and \$20 trillion in 2019 and 2020, respectively. If dark pools account for 15% of total crypto volume, dark pools would be responsible for \$2.25 trillion (2019) and \$3.00 trillion (2020) of volume. Republic Protocol's assumed share of the dark pool market (2.5%) would produce annualized turnover of \$56.25 billion (2019) and \$75.00 billion (2020). Using RenEx's total darknode reward fee of 0.32% and a 65% margin, these outcomes result in a gross profit of \$117 million (2019) and \$156 million (2020). With an estimated 3,000 darknodes paying an average \$600 per year in server costs, total net income for the network would be approximately \$115.2 million (2019) and \$154.2 million (2020). Using a Series A fundraising round's standard discount rate of 30% as the closest equity equivalent to the digital asset startup realm, discounted annual income would be \$88.6 million (2019) and \$91.2 million (2020). Subjected to a 15x PE multiple, REN is therefore projected to yield valuations of \$1.33 billion and \$1.37 billion in 2019 and 2020, respectively.

KPI / Data Point **Source****Analyst inputs/discussion**

Note: As with all forecasts, inputs are subjective, and we encourage readers to make their own assumptions about variables such as future market growth and market share capture.

We note that gas fees associated with running a darknode may vary greatly depending on the updates provided by the team, amount of orders, order size, and number of darknodes. The 65% margin is a reasonable lower bound, but we will have a better idea of future margins with the launch of mainnet and real world usage to analyze. The darknode trading fee of 0.32% is an estimate dependent on the structure of other exchanges built on Republic Protocol and future competition in the dark pool sector. Additional exchanges built on Republic Protocol could charge a fee greater than 0.4%, while market entrants could force RenEx to reduce its fee rewards to remain competitive.

**Token Liquidity
Profile**

The average 24-hour volume for the past 10 days is \$216,524, with an absolute range of approximately \$100,000-\$350,000. This is a large decrease from the approximately \$2 million 24-hour volume experienced during testnet launch in June and the release of the mainnet timeline in mid-September. UEX has the highest volume with approximately \$90,000, but the volume is heavily inflated from wash trading. Of the REN on UEX's bid books, only a small amount falls within 5% of the fair market value; REN volumes on HADAX and Liqui are similar. OKEx experiences less volume than UEX but has 260,000 REN in buy orders within 5% of market price, making it a legitimate exchange to accumulate or sell relatively large orders. IDEX does not experience inflated volume, but it still has a marginal amount of volume compared to OKEx.



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Disclosures

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The analysts disclose ownership of REN tokens as of the date of this report and reserves the right to take future positions in any of the coins discussed herein this report or otherwise at any time.

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