Public Interest Projects (PIPs):
A Fully Onchain, Risk Minimized Seed Funding Mechanism

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Introduction

The Initial Coin Offering (ICO) is a popular funding method for crypto projects to raise capital. In an ICO, crypto projects sell their native tokens in exchange for Ether (or other tokens) to investors. Although ICOs can be helpful in funding innovation, they have many structural problems which were magnified and abused as the popularity of ICOs grew during the 2017 crypto bull market.

The main criticism of ICOs is that funds are received in one lump sum. This makes it convenient for scams to occur and removes the concept of milestone-based funding. In traditional financing, teams raise small seed funds and then raise larger funds through Series A, B, C and so on. Subsequent fundraises only occur if teams achieve milestones and build investor confidence. With the popularization of ICOs, the concept of seed rounds for crypto projects financed by crypto participants have been largely overlooked.

The Public Interest Project (PIP) is a fully onchain seed funding mechanism which solves the many issues with ICOs while removing the risk of losing the patron's principal (assuming the smart contract is correctly built). The mechanisms of PIPs will be detailed in the later sections of this paper. Prior to discussing how PIPs work, it is helpful to give an overview of Initial Coin Offerings, Initial Exchange Offerings, and the growing decentralized financial ecosystem on the Ethereum Network.

ICO Overview

ICOs have helped many ambitious projects raise capital to further important technical development. For example, Ethereum, Cosmos, Polkadot, and other notable projects have been funded through ICOs. These projects have all created ecosystems for even more innovation to take place and have contributed important research around topics such as scaling and governance to the broader crypto ecosystem.
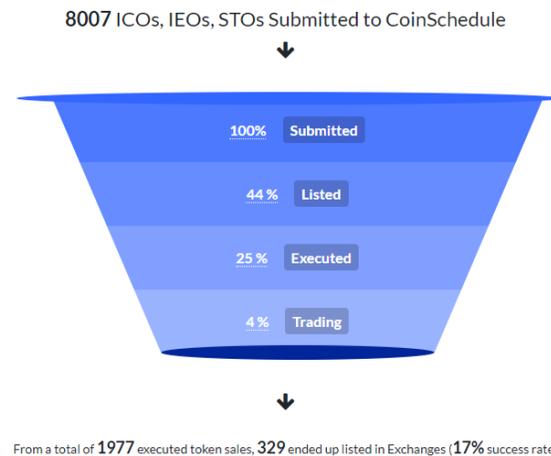
Although ICOs can be and have been immensely positive to the crypto industry, there are structural issues with the ICO that have been magnified and abused over the recent past. As crypto prices experienced hypergrowth during the bull run of 2017, the number of ICOs and ICO funds raised also grew dramatically.

	2016	2017	2018
ICO Funds Raised ($mm)	$256.90	$6,439.9	$21,110.8
YoY %		*2407%*	*228%*
Number of ICOs	52	442	1,053
YoY %		*750%*	*138%*

(Data from www.coinschedule.com – the numbers above present data from *successful* token sales which means the project managed to raise at least the soft cap. The numbers above do not include *failed* token sales)

The unfortunate side effect of this rapid growth in ICOs was an increased number of ICOs that have failed or have been outright scams, which have led to many investor losses. Data submitted to

CoinSchedule shows that of ICOs that successfully raised money, only 17% ended up being listed on an exchange. Similar metrics have been reported by a study from Satis Group which finds that approximately 78% of ICOs were scams, 4% failed, 3% had gone dead, and only 15% went on to trade on an exchange.

8007 ICOs, IEOs, STOs Submitted to CoinSchedule

100%	Submitted
44 %	Listed
25 %	Executed
4 %	Trading

From a total of 1977 executed token sales, 329 ended up listed in Exchanges (17% success rate)

These low success rates are not surprising when considering the main issues of ICOs, which are:

- All funds are received at once in a lump sum. This oftentimes can be tens of millions of dollars and even up to *billions* of dollars. This can skew the incentive for teams because funds are not given on any milestone basis. It's difficult (but not impossible) for teams to remain motivated when sitting on large amounts of capital.
- The lump sum nature of ICO funding also makes it convenient for scams to occur. All a scammer needs to do is make outlandish promises and can disappear after receiving the funds.
- In traditional financing, teams generally raise small seed rounds to get the company off the ground. If the team proves their competence through achieving milestones, they then raise larger rounds in Series A, B, C, and so on. Oftentimes with ICOs, large amounts of capital are raised in one lump sum without the need for teams to prove themselves, resulting in many failed projects.
- If investors find themselves unhappy with the direction of an ICO project, they are often left with no recourse. Even if the investor wants to sell their ICO tokens, they usually are not able to given that most ICO tokens never get listed on an exchange.
- Given the tightening regulatory stance of ICOs, projects that want to conduct an ICO must now comply with an ever-growing list of regulations. This often leads to excluding participants from many countries, taking away a main benefit of ICOs, which was that it used to be open to all who wanted to participate.
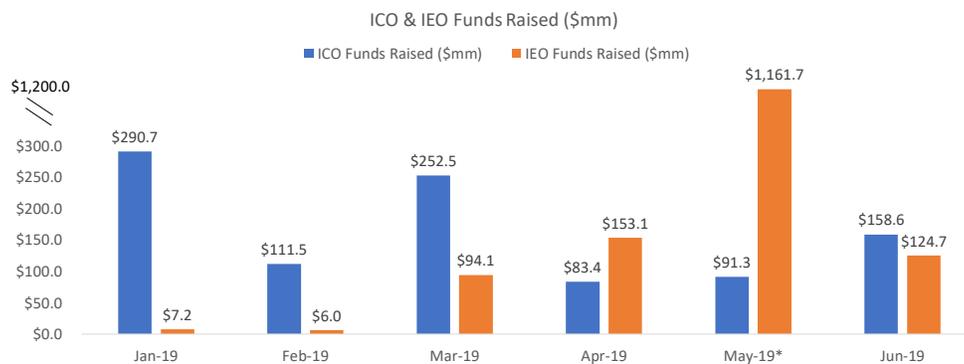- Projects depend on centralized exchanges to list the token to provide liquidity.

Given the structural issues of ICOs, it is no surprise that regulations have begun to tighten upon this method of funding. ICO fundraising has slowed down considerably in 2019 due to the tightening regulatory landscape and the bear market that followed the rapid rise of crypto prices in 2017.

|	2016	2017	2018	2019 H1
ICO Funds Raised ($mm)	$256.90	$6,439.9	$21,110.8	$988.0
YoY %		*2407%*	*228%*	*-94%*
Number of ICOs	52	442	1,053	94
YoY %		*750%*	*138%*	*-86%*

(Data from www.coinschedule.com – the numbers above present data from *successful* token sales which means the project managed to raise at least the soft cap. The numbers above do not include *failed* token sales)

Initial Exchange Offering (IEO) Overview

With the slowdown of ICOs, IEOs have sprung up as an increasingly popular way to raise capital. In an IEO, a crypto project works with a centralized exchange to raise funds and distribute tokens. IEOs have grown massively in popularity since January 2019 when BitTorrent did its IEO on Binance Launchpad. IEOs have already overtaken ICOs as the main source of funding in the first half of 2019.

ICO & IEO Funds Raised ($mm)

(*May-19 includes Bitfinex's $1bn IEO of UNUS SED LEO.
All data from CoinSchedule)

ICOs & IEOs Concluded in Month
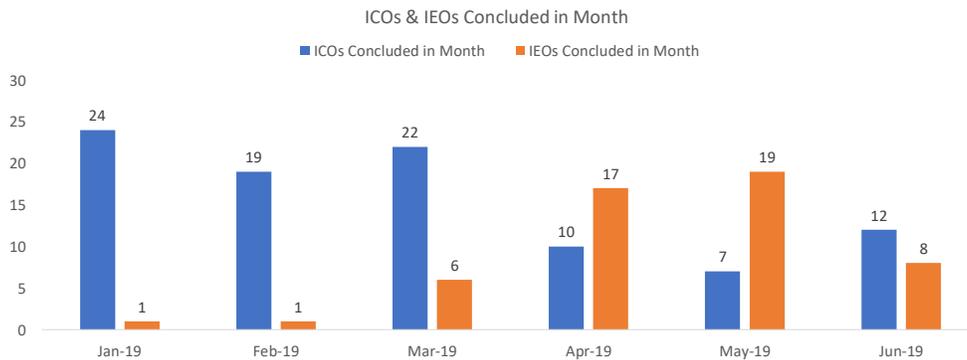
(All data from CoinSchedule)

Centralized exchanges claim that by being brokers in IEOs, they help to screen teams and only list reputable projects. While this has helped reduce the number of outright scams, it still does not address every issue of ICOs. The issue of funds being received all at once in a lump sum is still present and milestone-based funding is still generally nonexistent. IEOs also do not help to bring back the openness of ICOs of the past. In fact, IEOs have a stronger filter on preventing users from accessing IEOs. Only KYC'd members of the centralized exchange from a specific list of countries can participate in IEOs due to regulatory concerns.

Ultimately, IEOs still have the same main problem as ICOs, which is the lump sum nature of funding.

Decentralized Finance (DeFi) Summary

The Public Interest Project (PIP) is an alternative way to fund token projects that improves upon some of the shared issues with ICOs and IEOs. Before explaining how PIPs work, it is helpful to give a quick overview of the growing DeFi ecosystem within the Ethereum community which make PIPs possible.

The three main concepts to quickly cover are:

- **Decentralized Stability**: Dai is a decentralized stable coin pegged to the USD, which can be generated by locking up Ether. By enabling the creation of DAI through Ether and implementing a decentralized monetary policy, Dai provides stability to the crypto ecosystem without the need of centralized entities, which all other stablecoins rely on. If you'd like to learn more about DAI, please read this comprehensive [post](#) by MakerDAO.
- **Decentralized Money Markets**: The volume of decentralized peer to peer loans has grown rapidly over the past year. The most popular platform for people to loan out their crypto is [Compound](#). In just 2019 alone, according to [defipulse](#), Compound has grown from about $14mm of value locked up in January to about $90mm locked up in the beginning of August. Through Compound, users can loan out crypto and receive interest from users who pay interest for borrowing crypto. Compound and other decentralized money markets such as [Dharma](#) and [Nuo](#) help advance the crypto vision of "be your own bank."
- **Decentralized Exchanges (DEX)**: [Uniswap](#) has shown impressive adoption with about $500K in assets in January 2019 to about $18mm in assets in August 2019, according to [defipulse](#). The novel idea of Uniswap is that it automates the usually difficult process of market making, which generally requires a large amount of capital and proprietary software. Uniswap also allows for anyone to create markets for any ERC20 token, reducing the reliance on centralized exchanges.

There is much more detail to cover on the above projects and many projects not mentioned in this paper. It is highly recommended to learn more about these projects.

PIP Seed Funding Mechanism

The projects mentioned in the previous section serve as infrastructure that enables the Public Interest Project, or PIP, as a new onchain seed funding mechanism. With the exuberance surrounding ICOs in the 2017 bull market, seed round sized ICOs and milestone-based funding rarely occurred. PIPs address this lack of onchain seed funding mechanisms for token projects. (Contributors to PIPs will be referred to as patrons because it is important to make the distinction that patrons are **not** investors.)

PIPs fund projects in a way that, assuming the PIP smart contracts are valid, are risk free to the patron. This is an extremely beneficial property of PIPs given that the risk of losing invested capital is highest during the earliest phases of a project, such as a seed round. If the team proves themselves to the crypto community during the PIP phase, they can choose to conduct a follow on funding via a [DAICO](#).

The PIP is simply an addition to ideas already being discussed and implemented in the crypto community such as by [PoolTogether](#), [ZeframLou](#), [PaulRBerg](#), [rDai](#), and likely many others who have similar ideas.

Below is a *simplified* explanation of how the PIP works. At the end of this section is a link to the github repository which has the *technical* explanation and diagrams. Simplified version:

- A token project deploys a smart contract which interacts with the Compound protocol. Patrons can then send assets to the smart contract.
- The interest yielded from the patrons' assets in the smart contract are then sent to the token project, creating a stream of interest funding for the token project.
- The smart contract will send back an equivalent amount of the project's native token to the patron based on the interested yielded from that individual patron's staked assets.
- The token project (or anyone else) could create a market on Uniswap for the token to create a pool of liquidity for patrons to trade with. This price discovery would result in a market rate for the token to derive the amount of tokens necessary to send back to the PIP patrons.

To help tie the PIP mechanism together, let's go through a simple example. Alice, Bob, and Carol decide to pool their assets to fund Project XYZ and in return will receive XYZ tokens. Alice sends 200,000 DAI, Bob sends 300,000 DAI, and Carol sends 500,000 DAI for a total of 1,000,000 DAI in the PIP smart contract. In this example, assume that the interest rate (APR) is 10%. For simplicity, assume that the interest is paid daily and the project's tokens are returned daily. Finally, assume the price of XYZ token is equivalent to $0.5 USD and that DAI is equivalent to $1.00 USD. The diagram below shows how this would play out.
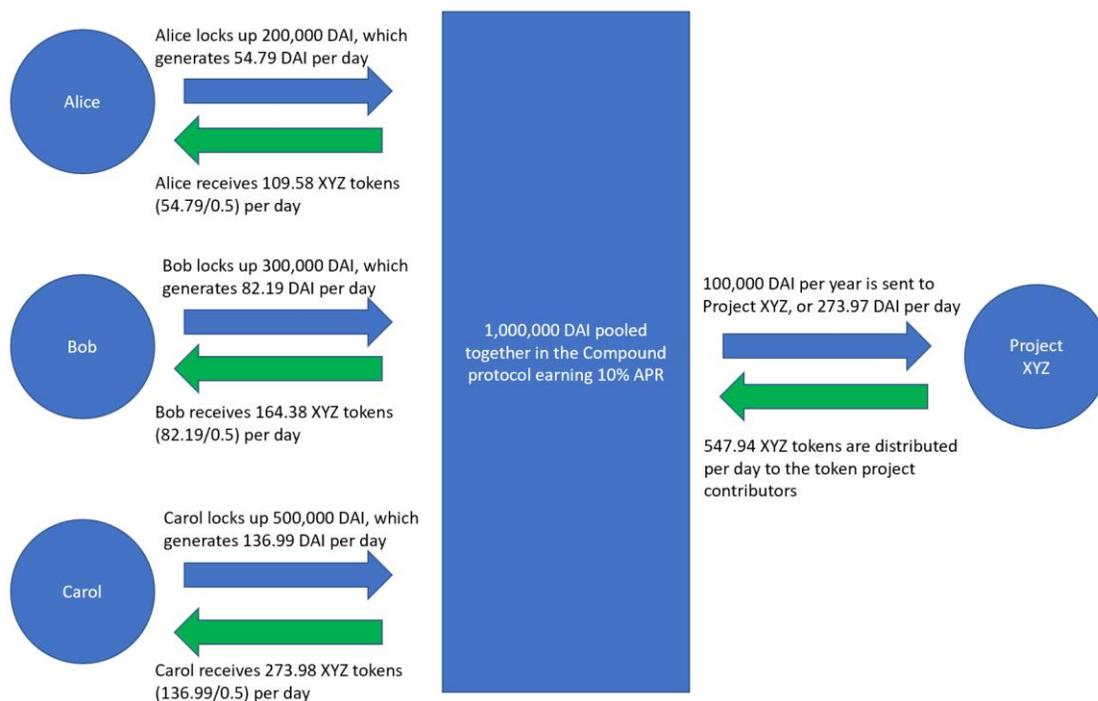
The technical explanation of how PIPs work can be found in this github repository. This repository also contains example smart contracts. ***These example smart contracts are not audited and are simply meant to help others get started quickly. These should NOT be used without further due diligence.***

PIP Seed Funding Benefits and Limitations

The PIP solves many of the problems that ICOs have been criticized for. Assuming the PIP smart contracts work as intended and that the price of DAI remains at $1 USD, the benefits of PIPs are:

- PIPs are a way for token projects to access seed funding fully onchain. If the project proves itself and builds investor confidence, it can choose to do a follow on round through a DAICO. This will help filter projects more effectively.
- Typically, the earlier that funding occurs, the riskier it is. The PIP removes the risk from seed round financing because funds are only sent via interest on the patron's capital. The patron only "loses" out on the opportunity cost of having invested that capital elsewhere. To compensate for this, the patron receives tokens from the token project equivalent to the interested gifted.
- PIPs essentially introduce milestone based funding to crypto financing because patrons can remove or add more assets to the PIP contract depending on their assessment of the project's development. This should create more motivation for teams to continue to build versus the lump sum model of ICOs.
- PIPs reopen funding opportunity to all who wish to participate because this is done entirely on the Ethereum blockchain, without reliance on outside entities.
- Projects funded through PIPs are not dependent upon centralized exchanges to provide liquidity. Projects can simply create their own Uniswap market from the beginning if they want.

Although PIPs carry many benefits, there are also limitations and unknowns which are:

- Since funding is sent as interest yielded from staked assets, the amount of funding a project receives may not reach very high amounts. Given that PIPs are meant to address the lack of seed funding mechanisms in the crypto market, the lower fund size is to be expected.
- If PIPs as a fundraising mechanism were to grow rapidly, it would introduce a large influx of loans supplied to the Compound protocol. All else equal, this would push the interest rates down for these assets. There may be a ceiling in the short term on how many projects could simultaneously run large PIPs.
- If interest rates dropped drastically, it would create strain for projects funded through PIPs. However, this does not differ much when compared to projects funded through Ether or other cryptos, which have declined drastically in price since the peak of the previous bull market. As always, responsible capital management is essential.
- The DeFi ecosystem is relatively brand new. There are still a lot of unknowns that could create unforeseen side effects from an influx of loan supply.

Customizability of PIP Contracts

PIP contracts can be and should be customized based on the project's needs. For example, a project could choose to require a lockup period of assets from patrons to help for more stability in budgeting. However, doing this could actually disincentivize patrons because of the higher commitment. A more creative approach may be to give an x% bonus of tokens to patrons who lock up assets for y months or longer, or x% additional tokens for each consecutive month assets are locked up. This gives the patron incentive to lock up assets, which preserves flexibility and incentivizes commitment rather than forcing commitment. To incentivize patrons to stake funds earlier, the customized PIP contract could also reward token bonuses of x% for the first month.

There is also flexibility on price setting around the token being distributed. For example, if a team chooses, it could restrict token trading by simply withholding the token until the end of a lockup period. These tokens would then be distributed to patrons after x amount of time and markets could be created for the token afterwards. This could help to prevent the possibility of a death spiral in price due to

factors outside of the project's control or could simply help divert attention away from price for public good projects where it's unlikely that the project will yield a direct financial return.

The specifics of a PIP contract should come down to what the team needs. There are likely many other mechanisms that others will innovate to create interesting PIP models to attract more interest.

Follow on Funding via DAICO

PIPs are a way to secure seed funding for crypto projects. If a project successfully proves itself to the broader crypto community through a PIP funding, it can then decide to raise follow on funding, much like a seed round leads to a Series A, B, C, and so on in traditional financing.

The logical follow on funding mechanism for a successful PIP project is the DAICO, which also solves the main issues of the ICO. For example, in a DAICO, token holders can vote on the rate at which DAICO funds are distributed to the project, which allows token holders to set the team's budget. Token holders can raise this budget responsibly over time if the team continues to deliver. Another benefit of the DAICO is that if token holders are unhappy with the performance of the team, they can vote to shut the DAICO down entirely and get the remaining Ether back. Token projects with a DAICO followon in mind could customize the PIP contract to give priority to patrons to participate in the DAICO.

The Aragon team has built an application called [Aragon Fundraising](#) to help projects conduct DAICOs, which can be a useful tool for projects trying to raise a follow on funding post PIP funding.

Closing Thoughts

The bull market of 2017 created a massive spike in the popularity of ICOs. Although ICOs have helped enable innovation for the crypto industry, the structural flaws of the ICO have been abused by scammers, have rewarded teams without any milestone structure, and have unfortunately led to many investors losing funds.

PIPs act as a seed round for crypto projects to get off the ground. Through this process, teams can prove themselves to the broader crypto community before taking on further funding. PIPs, assuming the smart contracts work as intended, remove the risk of losing patrons' capital since funds are gifted through interest yielded on the staked capital. Although the patron will lose out on opportunity cost, the patron will receive tokens in return for the interested gifted to the team.

The PIP is an example of how the crypto ecosystem can self-regulate and self-correct and move together towards more responsible mechanisms. Hopefully the PIP can serve as a seed funding option to help further the innovation of the crypto ecosystem at large while protecting patrons' capital.