THE PUBCOIN WHITEPAPER

Ruboss Technology Corporation
The Pubcoin Whitepaper

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This is a Leanpub book. Leanpub empowers authors and publishers with the Lean Publishing process. Lean Publishing is the act of publishing an in-progress ebook using lightweight tools and many iterations to get reader feedback, pivot until you have the right book and build traction once you do.

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Abstract

Pubcoin\textsuperscript{1} is a rewards platform for internet commerce, powered by a permissioned blockchain built on Quorum, JPMorgan’s fork of Ethereum. This enables bank-grade privacy through segmentation and cryptography, and transaction throughput measured in hundreds of transactions per second since no proof-of-work is required.

Pubcoin will be distributed via Token Sales on the public Ethereum blockchain: an Initial Token Sale (sometime in the next few months) and semiannual Subsequent Token Sales every June and November, starting in 2018. Pubcoin tokens (PUB) purchased in Token Sales can be used to acquire the Pubcoin tokens (QPUB) on the permissioned Pubcoin blockchain, and those tokens are usable for rewards at participating merchants.

Merchants can not only create Pubcoin-based rewards, they can also create their own branded Merchant Coins at a fixed conversion rate to Pubcoin. Since merchants can set the conversion rate and any conversion fees, this enables a range of attractive balances between transferability and exclusivity in creating an internet-based rewards program, simply by purchasing Pubcoin (PUB) on the public Ethereum blockchain and using them to acquire Pubcoin (QPUB) on the permissioned Pubcoin blockchain.

Pubcoin is completely generic, but is launching with a focus on ebooks. This is because Ruboss\textsuperscript{2}, the company that is creating Pubcoin, is also the company behind Leanpub\textsuperscript{3}. Leanpub is a popular ebook publishing site, which launched in 2010 and has paid millions of dollars in royalties to self-published authors. Leanpub is a powerful platform for serious authors, combining a one-click publishing workflow and an elegant storefront.

Ruboss is creating Pubcoin to solve a number of requirements that Leanpub and fellow publishers have, including a rewards program, cheaper, more fraud-resistant transactions, micropayments and tipping. Ruboss plans to use Leanpub to get Pubcoin in the hands of early customers, and will reach out to fellow publishers to grow Pubcoin.

\textsuperscript{1}https://pubcoin.com
\textsuperscript{2}http://ruboss.com/
\textsuperscript{3}https://leanpub.com/
Pubcoin Overview

Pubcoin is a rewards platform for internet commerce, powered by a permissioned blockchain. Like a rewards program, customers can earn Pubcoin when making purchases, and use that Pubcoin for discounts or free rewards. As a rewards platform, however, Pubcoin is not limited to one merchant: Pubcoin can be earned at any merchant which offers Pubcoin, and used at any merchant which offers Pubcoin-based rewards.

Pubcoin is built on a permissioned blockchain, the Pubcoin blockchain. The Pubcoin blockchain is based on Quorum, JPMorgan’s fork of Ethereum. Quorum is a permissioned blockchain with a simple privacy design, supporting smart contracts and both private and public transactions. Quorum is built for banks, enabling truly private transactions and high performance while still getting the benefits of a replicated shared ledger. Just as multinational banks require high performance and true privacy for transaction processing, a global rewards program requires institutional levels of transaction volume and truly private transactions.

Public blockchains have known scaling limitations. The two most famous public blockchains, Bitcoin and Ethereum, can process a relatively small number of transactions per second. Currently, Bitcoin can process 3 to 7 transactions per second, and Ethereum can process up to 20 transactions per second. The fact that the most prominent public blockchains are not suitable for a massive scale of transactions is not disputed, even by their strongest advocates. This was recently tweeted about by Nick Szabo: “At scale, you can’t pay for coffee on a premium global blockchain. You’ll need a peripheral financial [network] that settles on that blockchain.” By contrast, a permissioned blockchain built on Quorum can process hundreds of transactions per second—approaching the transaction volume of PayPal or the Visa network. This is possible since a permissioned blockchain does not require proof-of-work (“mining”). Even though Quorum is based on Ethereum, it scales to one or two orders of magnitude more throughput than Ethereum simply because there is no mining required.

Now, these transactions don’t just need to be fast, they must also be private. The only people who should be able to see the information in a given transaction are the merchant, its customer, and any relevant regulators. Merchants don’t want their competitors gaining intelligence on their transactions any more than banks want their competitors doing the same. Quorum solves this problem as well, supporting private transactions through cryptography and segmentation: the only people who have the private transaction data, even in encrypted form, are the parties to the transaction and any relevant regulators.

Pubcoin is being distributed via an Initial Token Sale on the public Ethereum blockchain. Besides being a source of funds, this sale will help ensure that Pubcoin are widely distributed: for a merchant to acquire a supply of Pubcoin to distribute as rewards, all they need to do is purchase Pubcoin tokens

https://twitter.com/NickSzabo/status/876879017445539840
in the Initial Token Sale and use them to acquire Pubcoin tokens on the Pubcoin blockchain after the sale concludes.

Pubcoin tokens on the public Ethereum blockchain are called PUB, and are ERC20 tokens. Once purchased, these PUB can be used to acquire Pubcoin tokens on the permissioned Pubcoin blockchain (QPUB tokens) at a 1:1 rate. This transaction is one-way: PUB can be used to acquire QPUB, but QPUB cannot be used to acquire PUB. QPUB have no cash value, cannot be converted into convertible cryptocurrencies such as Bitcoin or Ethereum, and can only be used as rewards. QPUB are rewards, not money. Merchants can offer Pubcoin-based rewards on the Pubcoin blockchain, such as free purchases or percentage discounts.

Besides just offering Pubcoin-based rewards, merchants can also use the Pubcoin blockchain to easily create their own Merchant Coins (MCoin) for their rewards program. Like QPUB, these MCoin are also ERC20 tokens that live on the Pubcoin blockchain. When a merchant creates an MCoin they set a permanently fixed conversion rate between QPUB and their MCoin. They also set whether there are any fees when converting from QPUB to their MCoin, and from their MCoin to QPUB. Finally, they create an initial supply of MCoin, by acquiring QPUB and transferring it to a reserve account. For simplicity, it is expected that many merchants will—like Leanpub—just use Pubcoin.

There is a fixed global supply of 100 billion PUB. All PUB are created upon creation of the Initial Token Sale contract. There is also a fixed global supply of 100 billion QPUB. All QPUB are created upon creation of the Pubcoin blockchain. To acquire QPUB, you purchase PUB and then send the PUB to the appropriate smart contract address on the public Ethereum blockchain. The details of how this smart contract works will be provided when the Pubcoin blockchain launches. PUB can be used to acquire QPUB at a 1:1 basis.

In addition to the Initial Token Sale, Pubcoin will conduct semiannual Subsequent Token Sales of PUB tokens on the public Ethereum blockchain. Starting in 2018, these Token Sales will occur every June (the “Summer Token Sale”) and November (the “Winter Token Sale”). Other than the Initial Token Sale, these Token Sales will be the only time that PUB tokens are sold by Pubcoin. The supply for these Token Sales will initially come from the stored supply, and then will be replenished by the correlated movement (described later) of PUB with the QPUB fees which are collected by Pubcoin on the Pubcoin blockchain. Finally, note that Pubcoin may sell QPUB tokens (not PUB tokens) directly to certain merchants, which will further decrease the available supply of PUB. This is discussed later.

With talk of permissioned blockchains, Initial Token Sales, ERC20 tokens and MCoin, Pubcoin sounds complex. However, for an average customer, Pubcoin will be as simple to earn and redeem as the coffeeshop or restaurant stamp cards that people carry. For merchants, Pubcoin will provide simple ways to create and market Pubcoin-based offers, via its website, public API and integrated checkout and authentication experience. And for merchants who want to create a blockchain-based, transferable, web-based rewards program, Pubcoin will get them most of the way there. Based on Ethereum and Quorum, Pubcoin will become a truly global, transferable loyalty program for internet commerce.
Pubcoin is a Transferable Rewards Platform

First and foremost, Pubcoin is a rewards platform. Participating in rewards programs is part of daily life for many people. For example, Ruboss co-founder Peter Armstrong carries in his wallet rewards cards and membership cards for two restaurants, two grocery stores, a bakery, a local coffeehouse, a big box store and a travel rewards program. The interesting thing about this example is just how typical it is: the sources of inspiration for Pubcoin are entirely mainstream services used by millions of consumers.

Rewards programs are the most powerful thing in retail next to “SALE”. One of the largest disadvantages that smaller internet merchants have is the lack of a rewards program. This is true even with internet purchases of physical goods or services. For example, independent hotels lose business to chains because they don’t have a rewards program, and the benefits of rewards programs are compelling. Furthermore, rewards programs get better the larger they become. When Marriott bought Starwood, arguably the most important customer benefit was that their rewards programs (Marriott Rewards and Starwood Preferred Guest) were partially combined.

Pubcoin can be given away by merchants and accepted for rewards directly, or can be used as the basis for Merchant Coins. (Note: in this section, “Pubcoin” refers to the QPUB tokens on the Pubcoin blockchain, not the PUB tokens on the Ethereum blockchain. The differences and relationship between PUB and QPUB are explained in depth later.)

Pubcoin-based Rewards

Merchants can offer Pubcoin as rewards on purchases, and can accept Pubcoin for reward purchases. Merchants who do so have an elegant, internet-based transferable loyalty program.

Pubcoin is transferable. Not only can Pubcoin earned from one merchant be spent at another, Pubcoin is also transferable between individuals, so people can share their Pubcoin with friends and family.

This has real advantages. A customer who shops at a given merchant only occasionally might not bother to accumulate rewards. However, if that customer already collects Pubcoin, then he or she can have the pleasure of earning and using rewards on even their first visit to a new merchant.

Merchants who want to accept Pubcoin don’t have to just give away products for free. Instead, they can accept Pubcoin to trigger percentage or absolute discounts. The great thing about using Pubcoin to earn discounts is that discounts have a value to customers which is much greater than their cost
to merchants. This is why merchants spend money to create and promote discount coupons such as 2-for-1, 30% off, etc. Coupons attract increased business, both from repeat customers looking to spend less money than they normally do, or new customers who can try the product at a lower risk than normal. Furthermore, the existence of a coupon allows merchants to offer the same product at multiple prices, all of which they would be happy to sell it at. This lets them hit multiple points on the demand curve—the higher initial price, and the lower coupon price(s).

For a merchant to offer a discount in exchange for Pubcoin is essentially just gamification of coupons—and coupons are things that merchants spend money to create, in order to give them away to attract customers. Also, accepting Pubcoin in exchange for a discount has the added benefit of replenishing the merchant’s supply of Pubcoin, which they can give away to more customers, perpetuating a virtuous cycle.

Finally, for many people, the act of collecting Pubcoin is itself a reward. People love collecting things, from hotel rewards points, to airline miles, to stamps. Collecting Pubcoin is itself a game, which offers benefits beyond the uses for the Pubcoin. But since Pubcoin are usable at any merchant which offers Pubcoin-based rewards, there are more uses for Pubcoin than for a single-merchant rewards program.

**Merchant Coins (MCoin)**

Instead of offering Pubcoin-based rewards, merchants can acquire Pubcoin to serve as the basis for their own Merchant Coins (MCoin). MCoin enable merchants to promote their own brand more directly than just using Pubcoin. They also enable the merchant to set a conversion rate and conversion fees between their MCoin and Pubcoin.

MCoin have a fixed conversion rate to and from Pubcoin (QPUB), which can range from 1 QPUB = 10 MCoin to 1 MCoin = 10 QPUB. The conversion rate determines how many MCoin are created when the merchant creates the MCoin, using QPUB as the reserve for it.

MCoin can also have an optional conversion fee set by the merchant to introduce friction when converting from QPUB. This Merchant Fee is set by the merchant, and is between 5% and 95% of the amount converted, when converting to or from the MCoin and QPUB. The Merchant Fee is split 70/30 between the merchant and QPUB: the merchant keeps 70% of it, and Pubcoin keeps 30% of it. If there is no Merchant Fee, there is a very low 1% conversion fee charged by Pubcoin. Pubcoin keeps the 1% conversion fee.

When there is no Merchant Fee to convert between QPUB and an MCoin, the low 1% conversion fee means that the MCoin is easily convertible into QPUB. Merchants can hand out their MCoin as rewards, and customers can use them for rewards at that merchant, or can convert them into Pubcoin for use at any merchant that offers Pubcoin-based rewards.

When there is a low Merchant Fee when converting between Pubcoin and an MCoin, say between 5% and 20%, our expectation is that some Pubcoin-collecting customers will still convert their Pubcoin into the MCoin, in order to take advantage of the rewards offered. After all, most customers will be
earning their Pubcoin as rewards, and there are typically fees or a conversion rate when converting from one rewards program to another—it’s typically less efficient to use your airline miles on a car rental than on a flight.

When there is a high Merchant Fee when converting between Pubcoin and an MCookie, there will be a lot fewer customers who choose to convert their QPUB into the MCookie, or who choose to convert their MCookie into QPUB. Merchants can set this fee as high as 95% when converting from QPUB to their MCookie or from their MCookie to QPUB. A high conversion fee lets merchants value their MCookie at more than just the conversion rate between their MCookie and QPUB which was set on creation of their MCookie. A high conversion fee means that customers either earned the MCookie from the merchant as a reward, or paid a lot of QPUB to convert into the MCookie. So this lets merchants offer premium rewards for their MCookie. The higher the Merchant Fee, the higher the premium the merchant is putting on loyalty.

The merchant can decide whether their MCookie is directly transferable between customers, or whether they must first be converted into QPUB. The reason a merchant would wish to require a conversion into QPUB is simple: merchants impose transfer fees to reward loyalty. Transferring Merchant Coins to someone else represents less loyalty. On the flip side, the reason a merchant would wish to allow direct transfer of their MCookie is equally simple: if friends and family can share MCookie to help each other get discounts, they will be happier about the rewards experience and they may shop more at the merchant or say nice things on social media.

Finally, merchants can waive the Merchant Fee when a customer is converting from their MCookie to specific other MCookies. This way, merchants can cross-promote with specific other merchants. This cross-promotion is similar to using airline miles to rent a car, or to a specific hotel chain helping its members get better deals with a specific car rental company.

**Low Transaction Fees**

Regardless of whether customers are using Pubcoin or an MCookie, the Pubcoin platform features very low transaction fees.

- There is no fee for a merchant to give Pubcoin or an MCookie to an individual.
- There is a “1% fee” when an individual uses Pubcoin or an MCookie at a merchant. This 1% fee is calculated as 1% of what the customer sends, and subtracted from that. So if an individual spends 100 Pubcoin or MCookie at a merchant, the merchant receives exactly 99 Pubcoin or MCookie. This fee percentage is identical whether it is Pubcoin or a MCookie being transferred. This fee is lower than the fees that merchants normally pay on credit card transactions.
- There is a slightly lower “1% fee” when an individual sends Pubcoin or a Merchant Coin to another individual. This fee is calculated as 1% of the amount the recipient receives, and is added to the Pubcoin or Merchant Coin that must be sent. So, for Alice to send Bob 100 Pubcoin or 100 MCookie, Alice must spend exactly 101 Pubcoin or 101 MCookie to do so. The reason for the difference is that if this was done the way that purchases work then if Alice
sent Bob 100 Pubcoin Bob would get 99 Pubcoin (whereas Alice might expect Bob to get 100 Pubcoin) or it would cost Alice 101.010101010101010101 Pubcoin (repeating 18 decimal places because that’s the resolution of Ethereum and thus Pubcoin) to send Bob 100 Pubcoin, which is ugly. So we’re not charging the extra 0.010101010101010101% on the transfer.

- Merchants cannot transfer Pubcoin to other merchants, so that case is not covered.
Launch Focus on Ebooks

While the technology behind Pubcoin is completely generic, Pubcoin is being launched in one vertical market: publishing. Ruboss, the company behind Pubcoin, is the company which created, owns and operates Leanpub. Leanpub combines a fully-automated ebook production workflow with an attractive storefront. Self-published authors use Leanpub to produce an ebook in PDF, EPUB and MOBI from a plain text manuscript, all with one click, and sell it on the Leanpub website. Since launching in 2010, we have published thousands of books and paid authors millions of dollars in royalties. Leanpub currently pays over $100K in royalties to authors every month. Leanpub’s solid reputation, history of innovation and traction with technical book authors gives us a platform to distribute Pubcoin—not only to our own readers and authors, but also as a trusted position from which to approach other publishers.

In the ebook market, Pubcoin has the potential to have wide-ranging, overlapping benefits for marketplaces, publishers, authors and readers. For publishers and marketplaces, these include reduced fraud, dramatically reduced transaction costs, and a secure, open, transferable way to do discounts, rewards programs and tipping. These benefits will enable innovation in business models, such as micropayments for serial publishing, which will enable better interaction between authors and readers.

The development of ebooks in China has shown that innovation in payments infrastructure for publishing can unlock massive opportunities for authors and readers and create enormous economic benefits. For example, Tencent purchased micropayment-focused publishing platform Shanda Cloudary, which includes literature sites Qidian and chuangshi.qq.com, for $800 million5. Pubcoin looks to bring a similarly transformative payment innovation to the rest of the publishing world.

The Total Addressable Market for ebooks is immense: the book market has annual revenues estimated at $150 billion6, with ebooks representing a double-digit percentage of that. The true size of the ebook market is hard to measure, and is systemically underrepresented: book sales are typically measured using ISBNs, which are optional for ebooks. Ruboss co-founder Len Epp wrote about this “dark matter” of the publishing industry on TechCrunch here7.

However, with the (large) exception of China, ebooks have not come close to reaching their transformative potential. Instead, ebooks have been hampered by the monopolistic ambitions of Amazon (with Kindle Unlimited looking to destroy value, not create it) and by the battle of the “Big 5” publishers and Amazon over pricing.

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5 http://publishingperspectives.com/2015/03/chinas-tencent-literature-focused-on-exploiting-ip/
In the future, Pubcoin could unlock many different ways to experiment in publishing. For example, an author could post a book outline on a Pubcoin-powered crowdfunding site, and wait to write the book until a certain number of Pubcoin were committed. This could even potentially be done automatically with smart contracts, and there could be an automatic refund if the author decided to abandon the book.

Two more benefits of launching in the publishing vertical are that the variable cost of selling an ebook is essentially $0, and many publishers are scared to death of Amazon. So, publishers can experiment with a rewards program without much risk—and they have the added motivation of the fear of Amazon to encourage them to try things. This is especially attractive to smaller publishers, who often don’t have the resources or time to build their own rewards program, let alone a cryptographically secured, transferable one.

Pubcoin will be an important, open piece of the payments infrastructure to enable the next revolution in global ebook publishing.
Why Now?

With any innovation, an important question is: “Why now?” What has changed to make this possible now, as opposed to five years ago? Also, is the market ready for this yet? After all, being too early is as bad as being too late.

Since we’re launching in the publishing market, for us the answer to this question is this: publishing is a large market with even larger problems.

The global ebook market has grown to represent billions of dollars in annual revenue. Billions of readers want to read the works of millions of authors on their smartphones. Reading on mobile is the future, yet payment on mobile currently suffers from two problems:

First, elegant in-app payments are currently taxed at 30% by Apple and Google: you cannot accept payment in a mobile app without paying Apple (iOS) or Google (Android) their 30% rake\(^8\). (If you’ve ever wondered why the Kindle app or the Leanpub app doesn’t let you buy a book, but instead just add one to your wishlist, now you know who to thank—you can’t even link to storefront web pages from your apps without violating Terms of Service!)

Second, in-browser payments are usually clunky and expensive. They involving typing credit card numbers in, which is never good on a phone, or relying on a third-party system like PayPal or Stripe to (hopefully) have the customer’s credit card information already stored. However, these services (and all credit cards) charge both a flat fee and a percentage fee, which means that the process is unworkable for small transactions and unwieldy for larger ones.

As a result, in the West there’s essentially nowhere that you can buy ebook chapters on your phone or computer for, say, between 10 cents and a dollar each. This would transform serial fiction and be technically trivial to implement—the only reason you can’t do it today is the fee structure of credit cards and PayPal and the 30% tax from Apple and Google. Pubcoin would allow this workflow (with prices in as small or as large an amount of Pubcoin as the author or publisher wished) in mobile web browsers, with no more taps than doing a credit card transaction using a service like PayPal or Stripe. And this Pubcoin-based transaction in a mobile web browser would have a 1% transaction cost.

Finally, Ethereum and ERC20 tokens have created an open source, globally-available, distributed smart contract infrastructure for anyone to build on top of. Combined with the current market conditions for Token Sales, this means there is ample capital available to purchase enough Pubcoin to effectively fund its growth.

In short, there is currently massive opportunity for Pubcoin.

\(^8\)http://abovethecrowd.com/2013/04/18/a-rake-too-far-optimal-platformpricing-strategy/
Pubcoin Architecture

Pubcoin: The Simple View

The following is the simple way that people will view their Pubcoin reward tokens:
As this figure shows, while the reality of the Pubcoin architecture involves a permissioned blockchain, ERC20 tokens, Merchant Coins, and a bunch of technical complexity, the way that the average consumer will view Pubcoin is actually pretty simple.

The Permissioned Pubcoin Blockchain

The Pubcoin blockchain is a permissioned blockchain based on Quorum, JPMorgan’s fork of Ethereum. The native token on the Pubcoin blockchain also has a name of Pubcoin. Its symbol is QPUB, with the Q for Quorum. When PUB are sent to the Market Account on the Ethereum blockchain, this triggers the appropriate transfer of QPUB from the Supply Account to the appropriate account on the Pubcoin blockchain.

There are five types of QPUB accounts on the Pubcoin blockchain:

1. The Supply Account
2. Individual Accounts
3. Merchant Accounts
4. The Growth Account
5. Reserve Accounts for MCoin

The Supply Account is the source of all QPUB. Initially, it will contain all QPUB in existence, 100 billion (100,000,000,000) QPUB. All 100 billion QPUB are created upon creation of the Pubcoin blockchain. After that, QPUB cannot be created or destroyed, simply transferred within the Pubcoin blockchain.

Individual Accounts are QPUB accounts for individuals (i.e. not merchants) on the Pubcoin blockchain.

Merchant Accounts are QPUB accounts for merchants on the Pubcoin blockchain. Some merchants will create MCoin and others will not, but all merchants will have Merchant Accounts for their QPUB. Leanpub will have a Merchant Account just like any other merchant, and the same fees will apply.

The Growth Account simply exists to give away QPUB to Individual Accounts or Merchant Accounts, to grow the Pubcoin ecosystem. The reason for this is discussed later.

Reserve Accounts for MCoin are controlled by Pubcoin. They contain the QPUB which serve as the backing for MCoin. There is a fixed conversion rate between an MCoin and QPUB.

Note that there are no QPUB in Merchant Accounts (including Leanpub’s account), Individual Accounts, the Growth Account or in Reserve Accounts on the Pubcoin blockchain until actions are taken on the public Ethereum blockchain. On the creation of the Pubcoin blockchain, all 100bn QPUB are in the Supply Account. To transfer QPUB from the Supply Account on the Pubcoin Blockchain, PUB must be sent to the Market Account on the public Ethereum blockchain. As PUB
are transferred to the Market Account by various parties, the appropriate transfers of QPUB from the Supply Account will occur. These are discussed later, in the discussion of PUB.

The Supply Account balance is replenished fees. These include the 1% Transaction Fee on every transfer from an Individual Account, the Pubcoin Fee when converting between QPUB and an MCoin which does not charge a Merchant Fee, and Pubcoin’s percentage of the Merchant Fee when converting between MCoin which charge Merchant Fees. Examples of each of these cases are covered in depth in a later section, entitled *Examples of QPUB Flows and Fees*.

The following figure shows the main focus of the movement of the “Pubcoin” QPUB ERC20 tokens on the private Pubcoin blockchain:

![QPUB Cycle Diagram](image)

**The QPUB Cycle**

Note that for simplicity the Reserve Accounts for MCoin and the Growth Account are not shown in this figure. This figure is just about the most important flows in the Pubcoin system, not every flow that exists.
Pubcoin (PUB) Movement on the Public Ethereum Blockchain

Pubcoin tokens on the public Ethereum blockchain are called PUB, and are ERC20 tokens. There will be a number of Pubcoin-related accounts on the public Ethereum blockchain. The following figure shows them, their state before the Initial Token Sale, and the flow of the “Pubcoin” PUB ERC20 tokens on the public Ethereum blockchain:

The PUB Cycle

There is a fixed global supply of 100 billion PUB. All PUB are created upon creation of the Token.
Sale contract. The flow of PUB on the public Ethereum blockchain between these accounts, shown previously, is inspired by the water cycle—fees are similar to evaporation, and the semiannual Subsequent Token Sales are precipitation.

**Correlated Movement of PUB and QPUB**

It is important to note that PUB are not converted into QPUB. There are always 100 billion PUB, and 100 billion QPUB. These are invariants. However, what does happen is that individuals and merchants can send PUB to the Market Account on the Ethereum blockchain, which causes the equivalent amount of QPUB to be transferred to the appropriate account (specified in the transfer of PUB) on the Pubcoin blockchain. The reverse is not true: there is no way provided by the Pubcoin blockchain for individuals and merchants to use QPUB to cause the movement of PUB on the Ethereum blockchain.

The only way that QPUB does cause the movement of PUB is in the QPUB fees that Pubcoin collects. Pubcoin collects QPUB fees in a number of ways: transaction fees, individual transfer fees, the 1% QPUB-to-MCoin conversion fees, and 30% of any Merchant Fees. These QPUB fees collected by Pubcoin move into the Supply Account on the QPUB blockchain, and an amount of PUB equal to those fees moves from the Market Account to the Supply Account on the Ethereum blockchain.

The Pubcoin-related accounts on the public Ethereum blockchain are described in more detail below.

**Market Account (Initial Balance: 0 PUB)**

The Market Account contains 1 PUB for every 1 QPUB in use. Since initially there are no QPUB in use, this account is initially empty. When someone uses x PUB to acquire x QPUB, what actually happens is:

1. The x PUB are moved into the Market Account from their Individual or Merchant PUB Account. This flow is labeled (B) in the previous figure.
2. The same x number of QPUB are moved from the Supply Account on the Pubcoin blockchain to a new or existing QPUB account.

Over time, the percentage of PUB in the Market Account will grow, approaching 100%. It should never reach 100%, however, since there will be fees transferred (batched on a daily or weekly basis) from the Market Account to the Supply Account.

**Supply Account (Initial Balance: 90bn PUB)**

The Supply Account will supply the Initial Token Sale and Subsequent Token Sales. The initial balance is 90bn PUB.
A maximum of 20bn PUB can be sold in the Initial Token Sale. This flow is labeled (A) in the previous figure. If the Initial Token Sale sells out, the Supply Account will contain 70bn PUB after the Initial Token Sale.

The Supply Account will also be used as the primary source for the Subsequent Token Sales, every June and November, starting in 2018. Up to 5bn PUB will be sold each Subsequent Token Sale. Up to 250m PUB of this amount per sale can be from the Team Account (while it has PUB); the remaining amount (up to 5bn) is from the Supply Account. The sale of PUB from the Supply Account in the Summer Token Sale (June) and Winter Token Sale (November) is labeled (D) in the previous figure.

The Supply Account will be replenished by the correlated movement of fees in the Pubcoin ecosystem: the 1% Transaction Fees, the 1% individual transfer fees, the 1% conversion fees and Pubcoin’s 30% portion of any Merchant Fees charged when converting MCoin. This correlated flow of fees, labeled (C) in the previous figure, is from the Market Account to the Supply Account.

**Growth Account (Initial Balance: 5bn PUB)**

The Growth Account will be used to seed the growth of Pubcoin.

Upon the launch of the Pubcoin blockchain, the 5bn PUB in the Growth Account will immediately be sent by Ruboss to the Market Account to acquire 5bn QPUB. Ruboss will not sell the PUB in the Growth Account. Instead, Ruboss will give away this 5bn QPUB in order to grow the Pubcoin ecosystem.

The primary use of QPUB from Growth Account is expected to be to reward signups and referrals. This may include individuals and merchants who sign up for Pubcoin.com accounts or refer people, similar to how PayPal gave away $20 to new customers and $20 for referrals⁹, or how Dropbox gave away extra storage as a referral bonus.

We may also give away QPUB to certain merchants to encourage them to try Pubcoin, in community events such as hackathons to raise awareness, and to people or organizations who find bugs in Pubcoin as a bug bounty.

**Leanpub Account (Initial Balance: 1bn PUB)**

The Leanpub Account will be used to reward Leanpub customers, including its readers, authors and publishers.

Upon the launch of the Pubcoin blockchain, Leanpub will immediately use its 1bn PUB to acquire 1bn QPUB. Leanpub will not sell its PUB.

Note that Leanpub has an outsized amount of QPUB. A normal merchant of Leanpub’s size would not need anything remotely like 1,000,000,000 QPUB to run a rewards program. Leanpub has this large amount partially as an incentive to Ruboss, but also to help distribute QPUB to a wide range of readers and authors.

⁹https://www.referralcandy.com/blog/paypal-referrals/
Just as Amazon is the first-and-best customer\(^\text{10}\) of Amazon Web Services (AWS), Leanpub will be the first-and-best customer of Pubcoin.

**Team Account (Initial Balance: 4bn PUB)**

To ensure that Ruboss has a long-term stake in growing the value of the Pubcoin ecosystem, we have the Team Account. The Team Account has 4 billion PUB. The Team Account will not sell any PUB in the Initial Token Sale, and the Team Account will not sell any PUB except via the Subsequent Token Sales. We are in this for the long term, not to make a quick buck. (For an example of how long we commit to things at Ruboss: we launched Leanpub in 2010.)

The Team Account can sell a maximum of 250M PUB in any Subsequent Token Sale. As such, the Team Account can sell a maximum of 500M PUB in one year, and it takes the Team Account a minimum of 8 years (through November 2025) to be depleted. There is no requirement for Ruboss to sell the maximum amount from the Team Account in any given Subsequent Token Sale, so it may take us even longer than that.

For clarity, in partial Subsequent Token Sales, the amount that is sold from the Team Account is sold before the balance from the Supply Account.

**Individual & Merchant Accounts (Initial Balance: 0 PUB)**

Initially, there are no accounts on the public Ethereum blockchain held by individuals or merchants that contain PUB. As PUB are purchased in the Initial Token Sale and the subsequent Summer & Winter Token Sales, individuals and merchants acquire PUB. These accounts on the public Ethereum blockchain are referred to as Individual and Merchant Accounts. These PUB can be used to acquire QPUB, by sending the PUB to the Market Account from the appropriate Ethereum accounts. Again, note that QPUB cannot be used by individuals or merchants to acquire PUB.

**Account Amounts following Maximum Initial Token Sale**

If the Initial Token Sale fully sells out, the following will be the distribution of PUB following the Initial Token Sale, but before any PUB are sent to the Market Account to acquire QPUB:

\(^{10}\)https://stratechery.com/2017/amazons-new-customer/
Distribution of PUB Immediately Following a Maximum Initial Token Sale

Here, “Token Sale” refers to all the individual accounts on the Ethereum blockchain that receive PUB tokens purchased in the Initial Token Sale. Since the Market Account will have an initial balance of 0 PUB, it is not shown in the figure.

Direct QPUB Sales from the QPUB Supply Account

Pubcoin may sell QPUB tokens (not PUB tokens) from the Supply Account directly to certain merchants, as a separate process from the subsequent Summer Token Sales and Winter Token Sales. If Pubcoin sells any QPUB tokens in this fashion, the equal number of PUB tokens will be transferred from the Supply Account on the public Ethereum blockchain directly into the Market Account on the public Ethereum blockchain. This will further decrease the available supply (in the Supply Account) of PUB.

This transfer will not decrease the amount of PUB available for sale in the next Subsequent Token Sale (either a Summer Token Sale or a Winter Token Sale), unless the transfer means that there are less than 5bn PUB in the Supply Account.

There are a few reasons that this approach exists:

1. Many publishers and other merchants are not technically savvy enough to participate in an Ethereum-powered token sale of PUB ERC20 tokens.
2. Even if the publishers or merchants are technically savvy enough to participate, their preferred purchasing process may be to send a purchase order and a wire transfer.

3. If publishers or other merchants wanted to adopt Pubcoin, forcing them to wait until the next Summer Token Sale or Winter Token Sale would add a needless delay and would slow the adoption of Pubcoin.

**Merchant Coins and the Pubcoin Blockchain**

When a merchant creates a Merchant Coin (MCoin), they must acquire QPUB (either by using PUB to acquire QPUB or by accepting QPUB from customers) in order to have a backing for their MCoin. At launch the minimum amount of QPUB needed to create an MCoin is 1,000,000 QPUB, but it may change in the future.

The entire supply of the MCoin is backed by QPUB which are held in reserve by Pubcoin on behalf of the merchant. When a merchant creates an MCoin they indicate how many QPUB they are using as the initial basis for it.

The acceptable conversion rate is $10 \text{ QPUB} \leq 1 \text{ MCoin} \leq 0.1 \text{ QPUB}$ — i.e. 1 MCoin cannot be worth more than 10 QPUB, and 1 QPUB cannot be worth more than 10 MCoin. So, 1,000,000 QPUB can create between 100,000 MCoin and 10,000,000 MCoin, depending on the conversion rate set by the merchant.

Every MCoin will have a unique name and a unique symbol. The name is human readable (e.g. “Peter Coin”) and can contain uppercase letters, lowercase letters, numbers and spaces. The symbol is between 3 and 8 uppercase letters (e.g. PTR).

Every merchant with no MCoin has one account, a Merchant Account (in QPUB). Every merchant with an MCoin has two accounts: a Merchant Account (in QPUB) and an MCoin Account (in their MCoin).

Pubcoin maintains a separate Reserve Account (in QPUB) for every merchant with an MCoin Account. The merchant does not manage their Reserve Account; this is managed on their behalf by Pubcoin. The Reserve Account for a merchant has the QPUB that corresponds to the number of MCoin that exist multiplied by the conversion rate of QPUB to MCoin. So, if 1 MCoin = 10 QPUB, then if there are 1000 MCoin in existence, the reserve account contains 10,000 QPUB. Similarly, if 1 MCoin = 0.1 QPUB, then if there are 1000 MCoin in existence, the reserve account contains 100 QPUB.

Upon creation of the MCoin, all the QPUB which are used as the initial basis for the MCoin are transferred to the Reserve Account for that merchant.

The global supply of an MCoin increases when more QPUB are deposited into the Reserve Account for a merchant. This can be done either by the merchant acquiring and depositing QPUB directly, or by a customer converting QPUB (or some other merchant’s MCoin) directly into the merchant’s MCoin.
The global supply of an MCoin decreases when a customer converts the MCoin into QPUB or some other merchant’s MCoin (which happens via a conversion to QPUB and then a conversion into the other MCoin).

**Pubcoin.com and the Pubcoin API**

Besides the permissioned blockchain and all that entails, Pubcoin will also feature an elegant website and robust API.

We currently plan to provide the following services with Pubcoin.com:

- an API for a merchant to accept purchases or issue discounts in exchange for QPUB or MCoin
- an API for a merchant to transfer QPUB or their MCoin to an individual with a Pubcoin account as a reward
- an API for a merchant to transfer QPUB or their MCoin to an individual who does not have a Pubcoin account, subject to their signing up for a Pubcoin account
- a web-based way for a merchant to create an MCoin based on an initial supply of QPUB
- an API for merchants to optionally publicly list offers in either Pubcoin or in their MCoin
- a list of the fixed conversion rates between all MCoin and Pubcoin
- a list of all the Merchant Fees charged by merchants with MCoin
- a list of any Merchant Fee waivers for specific MCoin

**Transaction Fee Mechanics**

As discussed, the Pubcoin platform features very low transaction fees:

- There is a 1% fee when an individual uses Pubcoin or an MCoin at a merchant.
- There is a 1% fee when an individual sends Pubcoin or an MCoin to another individual.

When a fee is charged, the following steps occur:

1. The 1% fee is collected in QPUB, with a conversion from the MCoin to QPUB if necessary.
2. The QPUB is transferred to the Supply Account on the Pubcoin blockchain.

We will execute a correlated transfer from the Market Account to the Supply Account on the public Ethereum blockchain. This transfer will be combined with other transfers, for efficiency and to save fees. We plan for these transfers to be executed within a week of the Pubcoin blockchain transfers.
Conversion Fees Between QPUB and MCoin

As discussed, when converting from QPUB to MCoin or from MCoin to QPUB there is either a Merchant Fee or a Pubcoin Fee.

Here are the specifics:

1. A merchant may choose to charge a Merchant Fee in one direction (e.g. QPUB to MCoin) but not in the other direction (e.g. MCoin to QPUB).
2. A merchant may charge a different Merchant Fee when converting from QPUB to their MCoin or from their MCoin to QPUB.
3. If a Merchant Fee is charged, it must be between 5% to 95% of the transaction.
4. The Merchant Fee is split 70/30 between the merchant and Pubcoin: the merchant keeps 70% of it, and Pubcoin keeps 30% of it.
5. The QPUB to MCoin Merchant Fee exists to allow merchants to make MCoin earned as rewards a more effective way to acquire MCoin than by converting QPUB, by adding friction when converting QPUB by making it less economical to do so.
6. The MCoin to QPUB Merchant Fee exists to allow merchants to incentivize customers to use MCoin that were earned as rewards on the merchant’s store, instead of converting them. This seems heavy-handed, but it allows merchants to be more generous than they may be otherwise.
7. When converting between QPUB and an MCoin, if there is no Merchant Fee charged in the given conversion direction, then there is a Pubcoin Fee. This is a 1% fee, and the QPUB collected in that fee goes to Pubcoin not to the merchant.
8. Pubcoin’s portion of all fees collected goes into the Supply Account.

Numerous examples are provided later in the Examples of QPUB Flows and Fees chapter.

Conversion Between Two MCoin

It is also possible to convert directly between two different MCoins, say ACoin and BCoin.

Here are the specifics:

1. To set the conversion rates, the conversion is done as the combination of two conversions, ACoin to QPUB and then as QPUB to BCoin.
2. If there is no Merchant Fee on either conversion, then there is only one Pubcoin Fee of 1% charged.
3. If there is a Merchant Fee on one of the conversions, then only the Merchant Fee is charged. Pubcoin earns enough from its 30% of whatever Merchant Fee is charged; there’s no reason to also charge a Pubcoin Fee.
4. If both merchants charge a Merchant Fee, then both Merchant Fees are charged. Pubcoin earns 30% of both Merchant Fees.

5. A merchant can have a Merchant Fee but selectively waive it for conversions to or from specific other types of MCoin. If this is the case, and if the other merchant also waives the Merchant Fee or does not have one, then one Pubcoin Fee is charged. If the other merchant has a non-waived Merchant Fee, then the other merchant’s Merchant Fee is charged, and no Pubcoin Fee is charged.

Numerous examples are provided later in the Examples of QPUB Flows and Fees chapter.

**Invariants and The One-Way Gate**

The Examples of QPUB Flows and Fees chapter contains a number of examples about the flow of QPUB and MCoin. Frankly, spelling things out in all their detail can make them appear more complicated than they really are, especially with the longer examples. However, there are three really important things to emphasize.

First, after the Pubcoin blockchain is created, the global supply of QPUB is invariant. It is 100,000,000,000 QPUB. Forever. After the initial creation of QPUB, QPUB cannot be created or destroyed. QPUB only change possession, in order to reflect rewards activity by members of the Pubcoin ecosystem.

Second, the conversion rate between QPUB and an MCoin is another invariant. It is set when the MCoin is created, and cannot be changed. Instead, the supply of a given MCoin fluctuates as conversions to and from QPUB happen.

Third, and most important, is this: QPUB and MCoin **CANNOT** be converted into PUB, into virtual currency such as Ethereum or Bitcoin or into fiat currency such as USD or CAD. QPUB and MCoin are rewards points with no cash or other monetary value. They can be converted into each other, but **NOT** into PUB, convertible virtual currency or fiat currency. They are functional utility tokens in the great carnival that is the Pubcoin ecosystem. Just like with actual carnival tokens, the way you acquire them is with something which is real. For a carnival, you are spending fiat currency, such as USD or CAD. For Pubcoin, you are spending convertible virtual currency (Ethereum) to acquire PUB, for the sole purpose transferring those PUB to the Pubcoin Market Account on the Ethereum blockchain in order to acquire QPUB. Now, with a carnival token, you may or may not be able to convert any unused tokens back into fiat currency at the end of the night. Chances are you can’t, given how most carnivals work. But with Pubcoin, you definitely cannot. **Using PUB to acquire QPUB is a one-way gate. You cannot go from QPUB or an MCoin back to PUB under any circumstances, let alone to Ethereum or a fiat currency.** This is why we state that QPUB and MCoin have no cash value—because they don’t.
Subdivision of Each PUB and QPUB into $10^{18}$ Pubflakes

Finally, to round out the architecture chapter, a minor technical detail. Unlike a physical coin, Pubcoin (both the PUB and QPUB varieties) can be subdivided. PUB and QPUB are both ERC20 tokens, and the convention in the Ethereum community is to use 18 decimal places for ERC20 tokens. This is because Ethereum itself uses 18 decimal places: 1 Ether (ETH) = $10^{18}$ wei. Yes, one ETH can be subdivided into 1,000,000,000,000,000,000 pieces called “wei”.

This is useful since this way all math can be done with integers—just really, really big integers. Now, for normal usage, dividing a Pubcoin into $10^3$, i.e. 1000, pieces should be plenty. However, we are going to support the Ethereum standard and support dividing a Pubcoin into $10^{18}$ pieces, called “Pubflakes”. We want a different name than “wei”, since while PUB and QPUB are ERC20 tokens they are decidedly not the same thing as ETH. So, a cheesy pun: Pubcoin.com is cloud-based, and it will be full of unique Pubflakes. And 100 Billion Pubcoin times $10^{18}$ Pubflakes should definitely be enough for everybody.
Pubcoin Team

The company that is behind Pubcoin is Ruboss Technology Corporation\textsuperscript{11}, a company based in Victoria, British Columbia, Canada.

Ruboss created, owns and operates Leanpub\textsuperscript{12}. Leanpub is a powerful platform for serious authors, which is well-regarded by readers, authors and publishers. Since launching in April 2010, Leanpub has grown to over 1M readers and paid over $5M in royalties to authors. Leanpub currently pays over $100K in royalties to authors every month.

From left to right, the co-founders of Ruboss are:

Peter Armstrong, Founder & CEO

Peter has almost two decades of experience in software, half of it as a developer at Silicon Valley startups. He founded Ruboss in 2008. Peter is also the author of 5 books: \textit{Flexible Rails}\textsuperscript{13},

\textsuperscript{11}http://ruboss.com/
\textsuperscript{12}https://leanpub.com/
\textsuperscript{13}https://www.manning.com/books/flexible-rails
Hello! Flex 4\textsuperscript{14}, Lean Publishing\textsuperscript{15}, The Markua Specification\textsuperscript{16} and Programming for Kids\textsuperscript{17}. He has a BSc in Computer Science and Psychology from the University of Victoria.

Scott Patten, Co-Founder
Scott is a programmer and web developer. He has an MSc in Physics from the University of British Columbia and spent a decade gainfully employed as a physicist shooting lasers at polymers and ink drops at paper. In 2006 he switched to programming full time. He joined Ruboss as a co-founder in 2009, and created Leanpub with Peter in 2010. Scott is the author of The S3 Cookbook and the lead author of Leanpub’s book generation engine.

Braden Simpson, Co-Founder & CTO
Braden is the “10x engineer” all startups wish they had. He loves writing code to solve hard problems. After graduating with a BSc in Computer Science from the University of Victoria, Braden joined Ruboss in 2013 and eventually became a co-founder and its CTO.

Len Epp, Co-Founder
Len is a former investment banker with a DPhil in English Literature from Balliol College, Oxford. He joined Ruboss in 2012 and led customer development on Leanpub for three years before becoming a co-founder.

At launch, Pubcoin will be owned and operated by Ruboss, just as Ruboss owns and operates Leanpub. With any blockchain project, governance is an interesting question. Ruboss may, at its sole discretion, create a Pubcoin Foundation or a separate Pubcoin corporation to manage and maintain Pubcoin in the future. This decision will be influenced by many factors.

Ruboss is a strong team which works amazingly well together, having bootstrapped the development of Leanpub over the past 7 years. The title of co-founder is not something we have handed out lightly—Peter and Scott created Leanpub together, and Len and Braden have earned it with years of effort and sacrifice.

We also have great employees, lawyers, accountants and bookkeepers. Ruboss’s legal representation is by David Ford and his team at Miller Titerle Law Corporation\textsuperscript{18}, based in Vancouver, BC, Canada.

\textsuperscript{14}https://www.manning.com/books/hello-flex-4
\textsuperscript{15}https://leanpub.com/lean
\textsuperscript{16}https://leanpub.com/markua/read
\textsuperscript{17}https://leanpub.com/programmingforkids
\textsuperscript{18}http://www.millertiterle.com/
Token Sales

We are having an Initial Token Sale and Subsequent Token Sales of Pubcoin in order to raise funds for a number of reasons, including the following:

- The development of the Pubcoin blockchain, Pubcoin.com and the Pubcoin API, including software engineering, security, legal, accounting, and administrative expenses.
- Sales, marketing and PR expenses in rolling Pubcoin out to publishing and other merchant partners.
- Proof of Pubcoin’s viability in the marketplace. Token sales raise awareness as well as money, and a successful Initial Token Sale will help the marketing of Pubcoin to merchants, publishers, authors and readers.

The goals of both the distribution of the tokens between various accounts and the mechanics of the Initial Token Sale are:

1. To fund the development of Pubcoin.
2. To ensure that Pubcoin are distributed at fair market value at launch.
3. To ensure that sufficient Pubcoin are in the hands of publishers, authors, readers and marketplaces.
4. To ensure that Leanpub has an ample, but not excessive, amount of Pubcoin for its uses, in order to get Pubcoin into the hands of many technically-savvy readers and authors.
5. To ensure that Ruboss, the team behind Pubcoin, has a long-term financial incentive to grow Pubcoin.

The following sections describe how the various token sales will work.

Initial Token Sale

In the Initial Token Sale there will be a maximum of 20bn PUB sold.

Almost all of these will be sold via a modified Dutch Auction. We may conduct an optional Presale of some of these PUB. If we do, it will not increase the number of PUB sold in the Initial Token Sale. There will be a maximum of 20bn PUB sold, regardless of whether a Presale occurs or how large it is.
Optional Presale

If there is sufficient demand from accredited investors who can help Pubcoin, we may sell some of the Initial Token Sale tokens in a Presale.

If we do a Presale, this will be how it works at a high level:

1. We will accept USD via wire transfer only.
2. The minimum amount of a Presale purchase will typically be $100,000 USD. We may accept lower amounts from sophisticated investors who can help Pubcoin in some way.
3. Even though we are Canadian (based in British Columbia) and we do not consider Pubcoin to be securities, the Presale will only be open to American accredited investors. Since many Canadian accredited investors are based in Ontario, we are wary of the warnings issued by Ontario-based Kik in their recent token sale.
4. The Presale valuation may be at a discount, based on many factors.
5. The amount of PUB purchased will be determined by the value of ETH in USD at a rate mutually agreed upon before any wire is sent.
6. We currently do not plan to start the Presale or accept the wire transfer of any funds until the Pubcoin blockchain and service has launched.

Again, the Presale is specifically designed to be both optional and small. If we do sell Pubcoin in the Presale, we will disclose the exact number of Pubcoin sold and the exact amount of funds raised before the Initial Token Sale begins. These Pubcoin will be subtracted from the 20bn total of tokens sold in the Initial Token Sale.

If you are an American accredited investor who is interested in learning more about participating in the Presale, please sign up for the Initial Token Sale newsletter at https://pubcoin.com or email Peter Armstrong at peter@ruboss.com.

Modified Dutch Auction

Pubcoin is using a modified Dutch Auction mechanism for its Token Sale. This was notably used by Gnosis in their launch of their ERC20 Token, GNO.

Everyone who purchases Pubcoin in the Initial Token Sale will receive Pubcoin at the IDENTICAL valuation, which is the final valuation determined by the length of the Initial Token Sale.

The Token Sale will last roughly 30 days. What happens is that there will 30 discrete Periods, each roughly one day long, corresponding to 30 different valuations of Pubcoin.

With our Gnosis-style modified Dutch Auction mechanism, the valuation of the global, finite supply of Pubcoin decreases in each of the up to 30 Periods that the auction is live. People who buy Pubcoin in the auction on a given Period that the auction is live will receive at least the number of Pubcoin per ETH that is specified for that Period.
The Pubcoin auction is different than the Gnosis auction in one very important dimension: instead of fixing the money raised and changing the percentage sold, we are fixing the percentage sold and changing the money raised. The reasons to do this are as follows:

1. Regardless of the amount of money raised, we want a large Supply Account. Specifically, we want 70% of total Pubcoin supply in the Supply Account. If we fixed the money raised and varied the percentage sold, we would either have to have astronomical valuations or we would risk selling too much of the total Pubcoin supply and not having enough Supply Account remaining.

2. This helps ensure that more people who want Pubcoin can get it. From our perspective, a full sale concluding on Period 1 is not the optimal outcome: it means you either priced the sale too low, or you did not sell enough tokens. So, mathematically, our ideal is a full sale concluding sometime after Period 1—this way, we have more confidence that the quantity and price ranges were correct. Anything from a Period 2 sellout to a Period 30 sellout is arguably preferable to a Period 1 sellout, even though we earn less ETH. (With this logic, the ideal scenario in terms of regret minimization is a Period 2 sellout.)

3. If things go well, we earn more ETH than we would have if we had fixed the percentage. And if we earn less ETH, we do so in a way which preserves the amount of the Supply Account that we want. So, regardless of whether this mechanism causes us to earn more or less ETH, we are happy with it.

**Initial Token Sale Transaction Process**

The process of an individual purchase of PUB in the Initial Token Sale is a very specific sequence of steps. Here’s how it works:

1. The customer sends us a specific amount of Ether, x ETH, to our smart contract on the public Ethereum blockchain.
2. Our smart contract acknowledges the transfer, saying in effect “OK, we owe you x ETH worth of PUB”.
3. As the token sale progresses, the amount of PUB that x ETH is worth increases every token sale Period until the token sale concludes. At any time, the customer can request the PUB balance that they are owed (if the token sale stopped on that Period), and the smart contract will use the balance as though the token sale was concluding on that Period. Note that the customer cannot actually get their PUB at this time; this is just checking how much PUB they would be getting if the token sale concluded at that moment.
4. The Initial Token Sale concludes, either when the maximum amount of PUB is sold or when the 30 Periods have elapsed, after roughly 30 days.
5. The Period that the Initial Token Sale concludes in determines the valuation of PUB, meaning that the x ETH is worth x * valuation of 1 PUB = y PUB.
6. The customer can request the PUB balance that they are owed, and the smart contract will use the balance based on the Period that the Initial Token Sale concluded on to determine that amount.
7. The customer can request their PUB. The smart contract will use the balance based on the Period that the Initial Token Sale concluded on to determine the amount of PUB to send.
8. The customer can send their PUB to the Market Account on the Ethereum blockchain, causing the equal number of QPUB to be transferred into their Pubcoin blockchain account from the Pubcoin blockchain supply account.

Just as with the optional Presale, we currently do not plan to start the Initial Token Sale until the Pubcoin blockchain and service has launched.

**Initial Token Sale Details**

1. The size of the Initial Token Sale is 20bn PUB, minus any PUB sold in the Presale.
2. The Initial Token Sale takes Ether (ETH) only, since we’re doing a Dutch Auction and timing matters.
3. To participate in the Token Sale an individual or company must first sign up at Pubcoin.com and provide Know Your Customer (KYC) information.
4. The KYC information we will get from everyone will include the following: name, email address, date of birth, phone number, driver’s license / passport scan OR incorporation certificate, physical address (which includes street, postal code, and country), and the Ethereum account address for the purchase. If the person is purchasing on behalf of a business we also need the “I am not a shell bank”, “If I am a Financial Institution here is my AML policy” and “Here is what my business does” type of info.
5. We will not restrict the Initial Token Sale to accredited investors, since it is not a security.
6. The Initial Token Sale participants send us Ether from the Ethereum account addresses specified on their Pubcoin.com accounts which have applied to participate in the Initial Token Sale and been approved. We reject all Ether from Ethereum accounts which have not been associated with Pubcoin accounts which have applied to participate in the Initial Token Sale and been approved.
7. The Initial Token Sale will be via a modified Dutch Auction which consists of 30 discrete Periods, each roughly one day long.
8. The Token Sale will be funded entirely from the Supply Account. The Team Account will not sell any PUB during the Token Sale.

For specific examples of the mechanics of how an individual or merchant buys PUB in the Initial Token Sale, see the Token Sale Mechanics section later.
Initial Token Sale Valuation Scenarios

Since the valuation of Pubcoin changes based on which Period the Initial Token Sale concludes, the valuation of Pubcoin at the end of the Initial Token Sale has 30 different scenarios.

The valuations are calculated in ETH (Ether). These valuations determine the amount of the proceeds of the Initial Token Sale, if we sell the full 20bn PUB in that sale with no discounted PUB sold in the optional Presale.

Here are the ranges of numbers:

- 100,000 ETH: Sale proceeds if the Initial Token Sale fully sells out during Period 1
- 20,000 ETH: Sale proceeds if the Initial Token Sale fully sells out during Period 30
- 500,000 ETH: Valuation of PUB if the Initial Token Sale concludes during Period 1
- 100,000 ETH: Valuation of PUB if the Initial Token Sale concludes during Period 30
- 200,000 PUB: Amount of PUB 1 ETH buys if the Initial Token Sale concludes in Period 1
- 1,000,000 PUB: Amount of PUB 1 ETH buys if the Initial Token Sale concludes in Period 30

In the above list, the terms “fully sold out” and “concludes” are used deliberately. Since we allow partial sales, the sale may conclude on Period 30 with a partial sale. In this case, the amount of sale proceeds are obviously reduced. However, the amount of PUB that 1 ETH buys you is not affected by whether an Initial Token Sale which concludes on Period 30 is sold out or is a partial sale: in either case, 1 ETH turns into 1,000,000 PUB if the Initial Token Sale concludes on Period 30. Also, since we may have an optional Presale which may include discounts, the amount we earn with an Initial Token Sale which fully sells out during Period 1 will be less than 100,000 ETH if we sell any PUB during the optional Presale.

Note that the market capitalization of PUB, as listed by a site such as https://coinmarketcap.com/, would be based on the circulating supply of PUB. So, somewhat counterintuitively, that would not be the same as the valuation of the total PUB supply. Initially, it would be the same as the proceeds of the Initial Token Sale, regardless of whether that was a full or partial sale. (The PUB which were remaining in the Supply Account would not be in circulation, so they would not be part of the circulating supply.) However, as PUB are deposited into the Market Account in order to acquire QPUB, they are taken out of circulation, and thus the market capitalization of the circulating supply will decrease. So, the circulating supply will start at the number of PUB acquired in the Initial Token Sale, and then decrease (toward zero) as PUB are used to acquire QPUB. Furthermore, Leanpub’s PUB and the Growth Account PUB are immediately deposited into the Market Account, so they also do not increase the circulating supply of PUB. The only time that circulating supply increases is after the Initial Token Sale and after each subsequent Summer Token Sale or Winter Token Sale.

These are the exact numbers for each of the 30 Periods in which the Initial Token Sale can conclude:
Pubcoin Valuation Based on Initial Token Sale Length

Approximately 48 hours before the Initial Token Sale, a final version of this table will be posted on the Pubcoin website, https://pubcoin.com. It will contain the exact Period start and end blocks, based on block numbers on the public Ethereum blockchain.

For clarity, we show these scenarios in three graphs below.
This graph shows the sale proceeds (in ETH), if there is no Presale, a sold out Initial Token Sale, and if the Initial Token Sale ended on that Period. As shown by this graph, the amount of proceeds of a sold out Initial Token Sale range from a high of 100,000 ETH (for a full sale concluding in Period 1) to a low of 20,000 ETH (for a full sale concluding in Period 30). The proceeds will be even lower in a partial sale (all partial sales conclude at the end of Period 30) or if the optional Presale sells any PUB (since there may be discounts).
This graph shows the valuation (in ETH) of the entire global supply of Pubcoin, if the Token Sale ended on that Period. As shown by this graph, the valuation of the Total PUB Supply ranges from a high of 500,000 ETH (for a sale concluding in Period 1) to a low of 100,000 ETH (for a sale concluding in Period 30, with either a full or a partial sale).

The total valuation of Pubcoin on a given Period of the Initial Token Sale after Period 1 is 94.6014099636273% of the valuation on the previous Period. This ensures a nicely-spaced range of prices, which will let potential buyers evaluate whether they feel that there is a price offered during the Initial Token Sale that is worth paying for Pubcoin. If so, they simply can pick the Period that matches that valuation, and buy Pubcoin on that Period if the sale is still underway. If the sale has already concluded, then they did not buy at a valuation higher than they were comfortable with.

Note that if the Initial Token Sale does not sell out on Period 30, the Initial Token Sale still happens. It’s just a partial sale, and a smaller quantity of PUB is sold. In this case, the total Pubcoin valuation is the Period 30 valuation, 100,000 ETH.
This graph shows the number of Pubcoin that are purchased with 1 ETH if the Token Sale successfully ended on that Period. As shown by this graph, the amount of PUB that one ETH buys ranges from a low of 200,000 PUB (for a sale concluding in Period 1) to a high of 1,000,000 PUB (for a sale concluding in Period 30, either a full or a partial sale). Note that these graph labels truncate after the decimal point; a more accurate number is shown in the previous Pubcoin Valuation Based on Initial Token Sale Length table.

**Token Contract Address on Pubcoin.com ONLY**

Approximately 48 hours before the sale we will publish the token contract address of Pubcoin on the Pubcoin website.

For purposes of security, the token contract address will ONLY be published at the Pubcoin website, [https://pubcoin.com](https://pubcoin.com). The whitepaper will be updated to contain the token sale schedule and block numbers, but will not contain the token contract address.
**Initial Token Sale Schedule and Block Number**

The start of the Initial Token Sale will not occur until the Pubcoin blockchain and service has launched. We expect this to occur in the next few months.

The start of the sale will be specified by a block number on the Ethereum blockchain. Since the number of blocks mined per day on the Ethereum blockchain is decreasing steadily\(^\text{19}\), the block number which starts the sale will be published much closer to the start of the sale.

**Subsequent Token Sales**

The following is the plan for the Subsequent Token Sales:

1. There will be Subsequent Token Sales twice a year, in June and November of each year. These will be called the Summer Token Sale and the Winter Token Sale, respectively.
2. These may be conducted by modified Dutch Auction, or they may just be at a fixed price.
3. The first Subsequent Token Sale will be in June 2018, the Summer Token Sale.
4. Each Subsequent Token Sale will sell a maximum of 5 billion PUB. These are funded from the Supply Account, with the exception of a small portion from the Team Account.
5. There is no out of band distribution of tokens from the Supply Account, to merchants or customers. The Supply Account is only distributed via the Initial Token Sale and Subsequent Token Sales.

**Token Sale Mechanics**

The reason to buy Pubcoin in the Initial Token Sale or one of the Subsequent Token Sales is to acquire QPUB. This is what this process looks like, for individuals and merchants. These activities happen in a strict sequence.

**Individuals Buying PUB in a Token Sale to Acquire QPUB**

This is what it looks like for an individual, “Carl”, to attempt to buy 200,000 PUB on Period 1 of an Initial Token Sale which ends up concluding on Period 30. Note that for Carl’s benefit his attempt to buy 200,000 PUB turns into 1,000,000 PUB, since in this scenario the Initial Token Sale closes on Period 30, not Period 1:

1. Carl signs up for an individual account on Pubcoin.com.

\(^{19}\)https://etherscan.io/chart/blocks
2. Carl applies to be included in the Initial Token Sale, and provides the required Know Your Customer (KYC) information and provides the address of his account on the public Ethereum blockchain.

3. We review and approve Carl’s application.

4. Carl sends 1 ETH from his account on the public Ethereum blockchain specified in his Pubcoin.com account information, so that we can validate that he is allowed to make the purchase.

5. Our smart contract validates Carl and acknowledges the transfer. It takes Carl’s 1 ETH and says to Carl something to the effect of “OK, we owe you 1 ETH worth of PUB”. On Period 1, this is 200,000 PUB, which is what Carl wants.

6. Say the Initial Token Sale finishes on Period 30, either with a full or partial Initial Token Sale. In this scenario, Carl’s 1 ETH buys 1,000,000 PUB, not 200,000 PUB. So, Carl gets 800,000 PUB more than he would have gotten if the Initial Token Sale had concluded in Period 1. (Note that Carl must take the extra PUB; Carl does not have the option of taking a partial refund of ETH in order to only get 200,000 PUB.)

7. Carl requests his 1,000,000 PUB from the smart contract.

8. We send Carl 1,000,000 PUB.

9. Carl sends his 1,000,000 PUB to the Pubcoin Market Account on the Ethereum blockchain, providing his individual account information. This causes 1,000,000 QPUB to be transferred into his Pubcoin blockchain account from the Pubcoin blockchain supply account.

This process is shown in the following figure:
An Individual Buying PUB in the Initial Token Sale to Acquire QPUB

**Merchants Buying PUB in a Token Sale to Acquire QPUB**

This is what it looks like for a merchant, “Mary”, to buy 10,000,000 PUB on Period 30 of the Initial Token Sale:

1. Mary signs up for an merchant account on Pubcoin.com and provides the required Know Your Customer (KYC) information.
2. Mary applies to be included in the Initial Token Sale, and provides any additional required Know Your Customer (KYC) information and provides the address of her account on the public Ethereum blockchain.
3. We review and approve Mary’s application.
4. Assuming the Initial Token Sale has not closed before Period 30, Mary sends 10 ETH to the appropriate smart contract on Period 30 of the Initial Token Sale, including her Pubcoin...
account information in the transfer so we can validate that she is allowed to make the purchase.

5. Our smart contract validates Mary and acknowledges the transfer. It takes Mary’s 10 ETH and says to Mary something to the effect of “OK, we owe you 10 ETH worth of PUB”. On Period 30, this is 10,000,000 PUB.

6. The Initial Token Sale finishes on Period 30, either with a full or partial Initial Token Sale. Either way, Mary’s 10 ETH buys 10,000,000 PUB.

7. Mary requests her 10,000,000 PUB from the smart contract.

8. We send Mary 10,000,000 PUB.

9. Mary sends her 10,000,000 PUB to the Pubcoin Market Account on the Ethereum blockchain, providing her merchant account information. This causes 10,000,000 QPUB to be transferred into her Pubcoin blockchain account from the Pubcoin blockchain supply account.

This process is shown in the following figure:
Example of Pubcoin Usage: Leanpub

Leanpub will use Pubcoin to reward Leanpub customers, including its readers, authors and publishers. Leanpub will have 1,000,000,000 QPUB, so we will have a lot of QPUB to give away. But what will people be able to do with this QPUB on Leanpub?

We have lots of ideas, but these are the two things we’re planning to support reasonably soon:

1. Purchase Leanpub books. Leanpub authors will be able to opt-in to sell their books in QPUB as well as USD, either all the time or in special quantity-limited promotions such as “The Pubcoin Shelf”, described below.
2. Purchase book writing purchases. Since we started charging money to create Leanpub books in October 2016, Leanpub books have cost $99 USD per book for authors to create. We plan to support Leanpub authors paying for books in QPUB as well as in USD, or using their QPUB to get a discount on the USD price of a book writing purchase.

The Pubcoin Shelf will be a special new place on the Leanpub homepage. It will contain books which have opted in to having a quantity-limited discounted book purchase in Pubcoin. The limited quantity discount is one of the most popular game mechanics in modern retail, because it’s effective. There are many examples, but the most notable is Black Friday. The Pubcoin Shelf will combine the mechanics of the limited quantity discount with the mechanics of the collectible rewards program, so we’re really excited about it.

In order to show how Pubcoin can be used in a real storefront, the following figures show the currently planned design for integrating Pubcoin in the Leanpub book storefront. As with all design work, it is subject to change, but we hope it gives a good idea of how Pubcoin can be used by a merchant. There is nothing in these screens which is only possible for Leanpub to do: any merchant using Pubcoin could build a workflow like this.

Finally, note that Leanpub is going to just use Pubcoin (i.e. QPUB), not a branded MCoin. The reason for this is we want to get the Pubcoin brand in the minds of as many people as possible, and for us to use an MCoin would defeat that purpose.
Example of Pubcoin Usage: Leanpub

The Featured Book and The Pubcoin Shelf

This figure shows the Leanpub homepage which will include The Pubcoin Shelf below the Featured Book. Note that if the Featured Book has a Pubcoin price, it will show both the Pubcoin price and the USD price. (There will be absolutely no requirement for the Featured Book on Leanpub to have
Example of Pubcoin Usage: Leanpub

a Pubcoin price. We feature books editorially based on a variety of factors, but a Pubcoin price will not be one of them.)

Shopping Cart Review

The Leanpub shopping cart will support both USD and Pubcoin purchases. If only one of USD or Pubcoin is being used, the cart flow is simple. However, if both are used, it is more complex. The following screens show the USD + Pubcoin flow, since this is the most complex to handle.
Modal Price Editing

A Pubcoin purchase will have its price edited in a modal dialog, with an attractive slider. Pubcoin purchases on Leanpub will have minimum and suggested prices, like normal USD purchases on Leanpub. Most merchants only charge one price, however, and they are free to do that with Pubcoin as well. They’re also free to allow people to redeem Pubcoin for percentage discounts, etc.
Example of Pubcoin Usage: Leanpub

Continuing to Checkout

Once the customer is happy with their shopping cart, they click the Continue to Checkout button.
**Brief Explanation**

In the case where both USD and Pubcoin is being used to buy things in the same cart, we will briefly explain what is happening and give the customer the option of just paying all in USD.
Example of Pubcoin Usage: Leanpub

Credit Card or PayPal Payment

We will do the credit card or PayPal payment first for USD purchases, just like we normally do.
Example of Pubcoin Usage: Leanpub

You can download your receipt [here](#) or view your [Library](#).

---

**Payment info**

- US $2
- 2 Pubcoin

- 2 items with Pubcoin
- Pubcoin Total: 47

Complete purchase with Pubcoin
Add these items to Wish List

---

The following items have been purchased:

- **Download Links:**
  - [PDF](#) (for reading on a computer)
  - [EPUB](#) (for reading on phones and tablets)
  - [MOBI](#) (for reading on a Kindle)
  - Add a Kindle email [here](#)

---

**Message from the author(s):**

Thanks for purchasing my book! I hope you enjoy reading it. Follow me on Twitter (@@myusername) to receive any updates about the book. If you would like to keep up with general data science awesomeness from the John Hopkins Data Science Lab, you can sign up for our weekly newsletter at [link](#).

---

**Download Page and Complete purchase with Pubcoin Button**

After the USD portion of the purchase is complete, we will show the download page and provide a button to do the Pubcoin portion of the purchase.
Example of Pubcoin Usage: Leanpub

Reviewing Pubcoin Portion of Purchase

The customer can also review the planned Pubcoin portion of the purchase before proceeding, right from the download page. Once the “Complete purchase with Pubcoin” button is clicked, the rest of the purchase will proceed like a Pubcoin-only purchase which has continued from the checkout review page.
Signing in to Pubcoin

The way that the Pubcoin purchase is done is via a modal Pubcoin dialog which is opened right on top of the Leanpub checkout page. First, the customer signs in to Pubcoin if they are not already signed in.
Example of Pubcoin Usage: Leanpub

Reviewing the Pubcoin Purchase Summary

The Pubcoin purchase dialog shows the total Pubcoin being spent and a summary of the purchase. In Leanpub’s case, you’re buying entire ebooks. In cases where Pubcoin are being used to get discounts, Pubcoin would be describing the discount and asking whether you wanted to use your Pubcoin to get the discount.

To review the details of the purchase, the customer clicks the Purchase Details toggle to expand the purchase details.
Example of Pubcoin Usage: Leanpub

Reviewing the Purchase Details

Having reviewed the purchase details, you click Purchase with Pubcoin. This completes the purchase, closes the Pubcoin modal and puts the customer back on Leanpub—but with the Pubcoin portion of the purchase complete.
Example of Pubcoin Usage: Leanpub

Completed Pubcoin Purchase

Having completed the Pubcoin purchase, you see your newly-purchased ebooks, as well as the ones you also purchased with USD. You also see the additional Pubcoin you earned as a reward.

We’re excited to be building this workflow into Leanpub soon. We expect this to be launched before the launch of the Initial Token Sale.
Examples of QPUB Flows and Fees

Once PUB has been sent to the Pubcoin Market Account on the Ethereum blockchain to trigger the appropriate transfer of QPUB from the Supply Account on the Pubcoin blockchain to some other account on the Pubcoin blockchain, everything interesting happens in QPUB and in MCoin. These are representative examples of these processes, for individuals and merchants.

These examples show starting balances, the transaction being done, and the ending balances. These balance lists are not the debits and credits of double entry accounting, since that typically only makes sense to accountants. However, you could derive all the debits and credits required in double entry accounting from these descriptions.

 Merchants Using QPUB to Create an MCoin with An Initial Supply

This is what it looks like for a merchant, “Mary”, to create an MCoin called “Mary Coin” (symbol “MRY”) on the Pubcoin blockchain.

Assumptions:

- Mary is creating an MCoin called “Mary Coin”, with a symbol of “MRY”.
- The conversion rate is 1 QPUB = 10 MRY.
- Mary purchased 10,000,000 PUB in the Initial Token Sale.
- Mary sent 10,000,000 PUB to the Pubcoin Market Account on the Ethereum blockchain, triggering the transfer of 10,000,000 QPUB from the Supply Account on the Pubcoin blockchain to her Merchant Account on the Pubcoin blockchain.

Actions:

Mary uses the Pubcoin API to create MRY, with a fixed conversion rate of 1 QPUB = 10 MRY. Mary backs her coin with 10,000,000 QPUB from her Merchant Account. Since the coin is backed by 10,000,000 QPUB, and there are 10 MRY per QPUB, this creates 100,000,000 MRY. The 10,000,000 QPUB that Mary backed her new MCoin with end up in the Pubcoin-owned Reserve Account for MRY.

Balances:
The QPUB Account on the Pubcoin Blockchain (Balances in QPUB)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary’s Merchant Account</td>
<td>10,000,000</td>
<td>0</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for MRY</td>
<td>0</td>
<td>10,000,000</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

The MRY Account on the Pubcoin Blockchain (Balances in MRY)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary’s Merchant Account</td>
<td>N/A</td>
<td>100,000,000</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>N/A</td>
<td>100,000,000</td>
</tr>
</tbody>
</table>

This is also how a merchant increases the supply of their MCoin: all they need to do is acquire more QPUB to transfer to the Pubcoin-owned Reserve Account.

Note that the above balances are written in a way which lines up with the underlying way that Ethereum, Quorum and ERC20 tokens work. People don’t have a bunch of accounts with balances; instead, accounts essentially have a bunch of entries for the people. (Well, technically, the contract for each token has a bunch of entries, one for each account that has a balance in that token.) So, balances are written the above way, rather than listing a number of accounts for every person or entity in the system.

Also, note that all the actions in these examples are written as paragraphs, not as numbered lists, since paragraphs do not imply a strict synchronous sequence of discrete blocking steps, whereas numbered lists do imply that.

Finally, note that there is no fee when a merchant converts QPUB into their MCoin, or their MCoin into QPUB.

**Individual-to-Merchant Transfer**

An individual can transfer QPUB or an MCoin to a merchant to make a rewards purchase or to activate a discount.

**Case 1: Using QPUB to Purchase or Get a Discount at a Merchant**

**Assumptions:**

- Carl has at least 1000 QPUB, either earned as rewards from merchants or by using PUB purchased in the Initial Token Sale to acquire QPUB.
• Carl wants to make a purchase or get a discount from a merchant, Sam, which costs 1000 QPUB.
• Sam has 100,000 QPUB. (This doesn’t matter, but it’s representative to show a merchant with more QPUB than a customer.)
• The Pubcoin Supply Account has 70,000,000,000 QPUB. (Say this is the first purchase after the Initial Token Sale, and say all PUB have been used to acquire QPUB.)

Actions:
Carl sends Sam 1000 QPUB. A 10 QPUB fee goes into the Pubcoin Supply Account. Sam gets 990 QPUB.

Balances:

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>1,000</td>
<td>0</td>
</tr>
<tr>
<td>Sam’s Merchant Account</td>
<td>100,000</td>
<td>100,990</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,000</td>
<td>70,000,000,010</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

The 1% Transaction Fee is collected in QPUB and is transferred to the Supply Account on the Pubcoin blockchain. These fees replenish the Supply Account, in preparation for the next Subsequent Token Sale.

Recall that this 1% fee is calculated as 1% of what the customer sends, and is subtracted from that. So if an individual spends 100 Pubcoin or MCoin at a merchant, the merchant receives exactly 99 Pubcoin or MCoin.

Also, note that Leanpub is just another merchant. If Carl was buying something on Leanpub, Leanpub would look similar to Sam in the above example.

Case 2: Using an MCoin to Purchase or Get a Discount at a Merchant

This case shows a customer, Carl, using his balance of an MCoin (MRY, or “Mary Coin”) to make a purchase or get a discount from Mary the merchant. There is a 1% Fee, converted into QPUB.

Assumptions:

• Carl has 25,000 MRY, either earned as rewards from merchants or by using PUB purchased in the Initial Token Sale to acquire QPUB and then convert them into MRY.
Examples of QPUB Flows and Fees

- Carl wants to make a purchase or get a discount from a merchant, Mary, which costs 20,000 MRY.
- Mary has 90,000,000 MRY. She previously had 100,000,000 MRY, but she has been busy, handing out 10,000,000 MRY to her loyal customers as a thank you for their years of loyalty.
- The Pubcoin Supply Account starts with 70,000,000,010 QPUB, having collected fees in previous examples

**Actions:**

Carl sends Mary 20,000 MRY. A 1% fee is collected, which is 200 MRY, converted into 20 QPUB. This 20 QPUB is subtracted from the Pubcoin-owned Reserve Account for MRY and is added to the Pubcoin Supply Account. Since 20 QPUB has been removed from the Pubcoin-owned Reserve Account for MRY, 200 MRY are destroyed. Mary gets 19,800 MRY.

**Balances:**

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pubcoin-owned Reserve Account for MRY</td>
<td>10,000,000</td>
<td>9,999,980</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,010</td>
<td>70,000,000,030</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary’s Merchant Account</td>
<td>90,000,000</td>
<td>90,019,800</td>
</tr>
<tr>
<td>Carl’s Individual Account</td>
<td>25,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>100,000,000</td>
<td>99,999,800</td>
</tr>
</tbody>
</table>

**Individual-to-Individual Transfer**

An individual can transfer QPUB or (if the merchant permits their MCoin to be transferred) an MCoin to another individual.

There is a 1% fee. Recall that this 1% fee is slightly different: it is calculated as 1% of the amount the recipient receives, and is added to the Pubcoin or Merchant Coin that must be sent. So, for Alice to send Bob 100 Pubcoin or 100 MCoin, Alice must spend exactly 101 Pubcoin or 101 MCoin to do so.

As discussed, the reason for the difference is simple: when you are buying, the most important
amount is what you are paying; when you are transferring to a friend, the most important amount is the amount they are receiving. This math means the fee is slightly lower than it would be if it was 1% of what was being sent.

**Case 1: Transferring QPUB**

Here’s how this works when transferring QPUB:

**Assumptions:**

- Alice has 200 QPUB.
- Alice wants Bob to receive 100 QPUB. So she has to send 101 QPUB for Bob to receive 100 QPUB, because of the 1% fee.
- Bob currently has 50 QPUB.
- The Pubcoin Supply Account starts with 70,000,000,030 QPUB, having collected fees in previous examples

**Actions:**

Alice sends 100 QPUB to Bob. A 1 QPUB fee is added to the amount sent, so this costs Alice 101 QPUB to send. Bob gets 100 QPUB.

**Balances:**

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alice’s Individual Account</td>
<td>200</td>
<td>99</td>
</tr>
<tr>
<td>Bob’s Individual Account</td>
<td>50</td>
<td>150</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,030</td>
<td>70,000,000,031</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

**Case 2: Transferring MCoin**

Here’s how this works when transferring MCoin:

**Assumptions:**

- Alice has 2000 MRY.
- Alice wants Bob to receive 1000 MRY. So she has to send 1010 MRY for Bob to receive 1000 MRY, because of the 1% fee.
Examples of QPUB Flows and Fees

- Bob currently has 500 MRY.
- The Pubcoin Supply Account starts with 70,000,000,031 QPUB, having collected fees in previous examples.
- The total number of MRY starts at 99,999,800 MRY, having lost some MRY to fees in a previous example.

**Actions:**

Alice sends 1000 MRY to Bob. A 10 MRY fee is added to the amount sent, so this costs Alice 1010 MRY to send. The 10 MRY fee is converted into 1 QPUB, decreasing the global MRY supply by 10 MRY and increasing the Pubcoin Supply Account balance by 1 QPUB. Bob gets 1000 MRY.

**Balances:**

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alice’s Individual Account</td>
<td>2,000</td>
<td>990</td>
</tr>
<tr>
<td>Bob’s Individual Account</td>
<td>500</td>
<td>1,500</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>99,999,800</td>
<td>99,999,790</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alice’s Individual Account</td>
<td>200</td>
<td>99</td>
</tr>
<tr>
<td>Bob’s Individual Account</td>
<td>50</td>
<td>150</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,031</td>
<td>70,000,000,032</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

**Merchant-to-Individual Transfer**

Merchants can transfer QPUB or MCoin to individuals for no fee.

**Case 1: Transferring QPUB**

Here’s how this works when transferring QPUB:

**Assumptions:**
• Sam is a merchant with 100,990 QPUB from the previous example.
• Carl is an individual with a 0 QPUB balance from the previous example.
• The Pubcoin Supply Account starts with 70,000,000,032 QPUB, having collected fees in previous examples

**Actions:**

Sam sends Carl 100 QPUB. There is no fee, so the Pubcoin Supply Account is unchanged. Carl gets 100 QPUB.

**Balances:**

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl's Individual Account</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Sam's Merchant Account</td>
<td>100,990</td>
<td>100,890</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,032</td>
<td>70,000,000,032</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

**Case 2: Transferring MCoin**

Here’s how this works when transferring MCoin:

**Assumptions:**

• Mary is a merchant with 90,019,800 MRY from previous examples.
• Carl is an individual with a 5000 MRY balance from previous examples.
• The Pubcoin Supply Account starts with 70,000,000,032 QPUB, having collected fees in previous examples

**Actions:**

Mary sends Carl 1000 MRY. There is no fee, so the Pubcoin Supply Account is unchanged. Carl gets 1000 MRY.

**Balances:**
### The MRY Account on the Pubcoin Blockchain (Balances in MRY)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary’s Merchant Account</td>
<td>90,019,800</td>
<td>90,018,800</td>
</tr>
<tr>
<td>Carl’s Individual Account</td>
<td>5,000</td>
<td>6,000</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td><strong>Total (fluctuates)</strong></td>
<td><strong>99,999,800</strong></td>
<td><strong>99,999,790</strong></td>
</tr>
</tbody>
</table>

### Individual QPUB-to-MCoin and MCoin-to-QPUB Conversion

As discussed, MCoin have a fixed conversion rate to and from Pubcoin, which can range from $1 \text{ QPUB} = 10 \text{ MCoin}$ to $1 \text{ MCoin} = 10 \text{ QPUB}$. The conversion rate determines how many MCoin are created when the merchant creates the MCoin, using QPUB as the reserve for it. MCoin can also have an optional conversion fee set by the merchant to introduce friction when converting from Pubcoin. This Merchant Fee is set by the merchant, and is between 5% and 95% of the amount converted, when converting to or from the MCoin and QPUB. The Merchant Fee is split 70/30 between the merchant and Pubcoin: the merchant keeps 70% of it, and Pubcoin keeps 30% of it. If there is no Merchant Fee, there is a very low 1% conversion fee charged by Pubcoin. Pubcoin keeps the 1% conversion fee.

#### Case 1: No (or Waived) Merchant Fee, QPUB-to-MCoin

Here’s how this works when converting QPUB to MCoin, with no (or a waived) Merchant Fee. In this case, a 1% conversion fee is charged and is kept by Pubcoin.

#### Assumptions:

- Mary is a merchant with 90,019,800 MRY from previous examples.
- Carl is an individual with a 100 QPUB balance and a 6000 MRY balance from previous examples.
- The Pubcoin Supply Account starts with 70,000,0032 QPUB, having collected fees in previous examples.
- The Pubcoin-owned Reserve Account for MRY starts with 9,999,980 QPUB from previous examples.

#### Actions:

Carl converts 100 QPUB into MRY. There is a 1 QPUB = 10 MRY conversion rate, meaning this converts into 1000 MRY. There is no Merchant Fee, so the 1% Pubcoin Fee is collected. This is 1 QPUB, which is credited to the Pubcoin Supply Account. Carl gets 990 MRY.

#### Balances:
The QPUB Account on the Pubcoin Blockchain (Balances in QPUB)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for MRY</td>
<td>9,999,980</td>
<td>10,000,079</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,032</td>
<td>70,000,000,033</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

The MRY Account on the Pubcoin Blockchain (Balances in MRY)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>6,000</td>
<td>6,990</td>
</tr>
<tr>
<td>Mary’s Merchant Account</td>
<td>90,019,800</td>
<td>90,019,800</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>99,999,800</td>
<td>100,000,790</td>
</tr>
</tbody>
</table>

Note that there are now more MRY than Mary had created. This is because Carl is converting QPUB he acquired elsewhere into MRY. The total supply of an MCoin like MRY is not fixed, only the conversion rate is.

**Case 2: Merchant Fee, QPUB-to-MCoin**

A merchant can charge a Merchant Fee of between 5% and 95% inclusive. If this is charged, Pubcoin keeps 30% of it and the merchant keeps 70% of it.

In this case, let us assume that Mary is charging a 50% Merchant Fee when converting QPUB into MRY. Say Mary wants to reward her own loyal customers more than new ones, and decides this is how to do it.

We’re going to start with the same starting balances as Case 1, for simplicity. The scenario looks like this:

**Assumptions:**

- Mary is a merchant with 90,019,800 MRY from previous examples.
- Carl is an individual with a 100 QPUB balance and a 6000 MRY balance from previous examples.
- The Pubcoin Supply Account starts with 70,000,000,032 QPUB, having collected fees in previous examples.
- The Pubcoin-owned Reserve Account for MRY starts with 9,999,980 QPUB from previous examples.
Actions:

Carl is converting 100 QPUB into MRY. There is a 1 QPUB = 10 MRY conversion rate, meaning this converts into 1000 QPUB. There is a 50% Merchant Fee, so 50 QPUB goes to the Merchant Fee and 50 QPUB actually gets converted. The 50 QPUB which actually gets converted turns into 500 MRY, which is credited to Carl’s Individual Account of MRY. The 50 QPUB Merchant Fee is split 30% to the Pubcoin and 70% to the merchant. So the Pubcoin Supply Account increases by 15 QPUB, and Mary gets 35 QPUB. However, since Mary has the MRY merchant coin, those 35 QPUB are actually credited to the Pubcoin-owned Reserve Account for MRY, meaning that Mary’s Merchant Account increases by 350 MRY. (The reasoning here is that since Mary has the MRY MCoin, the best thing to do with her Merchant Fee portion of QPUB is to use it to increase the MRY supply. Since MRY can be converted back by Mary into QPUB at any time for no fee, there is no issue doing this.) So, the total amount that the MRY supply increases by is 850 MRY: 500 for Carl’s Individual Account, and 350 for Mary’s Merchant Account. The 15 QPUB fee that Pubcoin keeps is set aside, and not used to increase MRY supply.

Balances:

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for MRY</td>
<td>9,999,980</td>
<td>10,000,015</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,032</td>
<td>70,000,000,047</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>6,000</td>
<td>6,500</td>
</tr>
<tr>
<td>Mary’s Merchant Account</td>
<td>90,019,800</td>
<td>90,020,150</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>99,999,800</td>
<td>100,000,650</td>
</tr>
</tbody>
</table>

Again, note that there are now more MRY than Mary had created, as Carl is converting QPUB he acquired elsewhere into MRY.

Case 3: No (or Waived) Merchant Fee, MCoin-to-QPUB

This is the inverse of Case 1.

Here’s how this works when converting MCoin to QPUB, with no (or a waived) Merchant Fee. In
this case, a 1% conversion fee is charged and is kept by Pubcoin.

Assumptions:

- Mary is a merchant with 90,019,800 MRY from previous examples.
- Carl is an individual with a 100 QPUB balance and a 6000 MRY balance from previous examples.
- The Pubcoin Supply Account starts with 70,000,000,032 QPUB, having collected fees in previous examples.
- The Pubcoin-owned Reserve Account for MRY starts with 9,999,980 QPUB from previous examples.

Actions:

Carl converts 1000 MRY into QPUB. There is a 1 QPUB = 10 MRY conversion rate, meaning this converts into 100 QPUB. There is no Merchant Fee, so the 1% Pubcoin Fee is collected. This is 10 MRY, which is converted into 1 QPUB and credited to the Pubcoin Supply Account. Carl gets 99 QPUB.

Balances:

The QPUB Account on the Pubcoin Blockchain (Balances in QPUB)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>100</td>
<td>199</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for MRY</td>
<td>9,999,980</td>
<td>9,999,880</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,032</td>
<td>70,000,000,033</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

The MRY Account on the Pubcoin Blockchain (Balances in MRY)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>6,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Mary’s Merchant Account</td>
<td>90,019,800</td>
<td>90,019,800</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>99,999,800</td>
<td>99,998,800</td>
</tr>
</tbody>
</table>

Case 4: Merchant Fee, MCoin-to-QPUB

This is the inverse of Case 2.
A merchant can charge a Merchant Fee of between 5% and 95% inclusive. If this is charged, Pubcoin keeps 30% of it and the merchant keeps 70% of it.

In this case, let us assume that Mary is charging a 50% Merchant Fee when converting MRY into QPUB. Say Mary wants to reward her own loyal customers with more MRY than she would hand out as QPUB, and decides this is how to do it.

We’re going to start with the same starting balances as Case 1, for simplicity. The scenario looks like this:

**Assumptions:**

- Mary is a merchant with 90,019,800 MRY from previous examples.
- Carl is an individual with a 100 QPUB balance and a 6000 MRY balance from previous examples.
- The Pubcoin Supply Account starts with 70,000,000,032 QPUB, having collected fees in previous examples.
- The Pubcoin-owned Reserve Account for MRY starts with 9,999,980 QPUB from previous examples.

**Actions:**

Carl is converting 1000 MRY into QPUB. There is a 1 QPUB = 10 MRY conversion rate, meaning this converts into 100 QPUB. There is a 50% Merchant Fee, so 500 MRY goes to the Merchant Fee and 500 MRY actually gets converted. The 500 MRY which actually gets converted turns into 50 QPUB, which is credited to Carl’s Individual Account of QPUB. The 500 MRY Merchant Fee is split 30% to the Pubcoin and 70% to the merchant. So the Pubcoin Supply Account increases by 15 QPUB, and Mary gets 350 MRY. So, the total amount that the MRY supply decreases by is 650 MRY: 500 for Carl’s Individual Account, and 150 for the Pubcoin fee. In sum, Carl gets 50 QPUB, Pubcoin Supply Account gets 15 QPUB and Pubcoin-owned Reserve Account for MRY keeps 35 QPUB (for the 350 MRY moving from Carl to Mary).

**Balances:**

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for MRY</td>
<td>9,999,980</td>
<td>9,999,915</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,032</td>
<td>70,000,000,047</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>
### The MRY Account on the Pubcoin Blockchain (Balances in MRY)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>6,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Mary’s Merchant Account</td>
<td>90,019,800</td>
<td>90,020,150</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>99,999,800</td>
<td>99,999,150</td>
</tr>
</tbody>
</table>

### Individual ACoin-to-BCoin Conversion

When an individual customer converts MCoin that they have earned from one merchant (say Alice, with an MCoin called ACoin, symbol = ACN) to a different MCoin that another merchant accepts (say Bob, with an MCoin called BCoin, symbol = BCN), there are four cases to consider.

1. Neither merchant charges a Merchant Fee (or one or both normally do, but it is waived for transfers to the other merchant)
2. The origin merchant charges a Merchant Fee (when converting from ACoin to BCoin, Alice charges a Merchant Fee but Bob does not)
3. The destination merchant charges a Merchant Fee (when converting from ACoin to BCoin, Bob charges a Merchant Fee but Alice does not)
4. Both merchants charge a Merchant Fee (when converting from ACoin to BCoin, both Alice and Bob charges a Merchant Fee)

In these cases below, suppose that Alice and Bob are merchants and Carl is a customer. Alice has an MCoin called ACoin (ACN), and Bob has an MCoin called BCoin (BCN). Let us assume that 1 QPUB = 10 ACN (1 ACN = 0.1 QPUB), and 1 QPUB = 10 BCN (1 BCN = 0.1 QPUB). So, 1 ACN = 1 BCN, but QPUB are worth 10x either of them.

Note that in these examples, we’re going to start with a brand new set of round numbers for simplicity.

### Case 1: No (or Waived) Merchant Fees

In this case, there is only one Conversion Fee, which is a 1% Fee converted to QPUB and kept by Pubcoin. Here’s how it works:

**Assumptions:**

- Alice is a merchant with 5,000,000 ACN.
- Bob is a merchant with 5,000,000 BCN.
• Carl is an individual with 100 QPUB, 1000 ACN and 1000 BCN.
• The Pubcoin Supply Account starts with 70,000,000,000 QPUB.
• The Pubcoin-owned Reserve Account for ACN is 1,000,000 QPUB, so there are 10,000,000 ACN in existence.
• The Pubcoin-owned Reserve Account for BCN is 1,000,000 QPUB, so there are 10,000,000 BCN in existence.
• There are no Merchant Fees.

**Actions:**

Carl is converting 1000 ACN into BCN. 1000 ACN = 100 QPUB. There are no Merchant Fees, so a 1% Pubcoin Fee is charged. So, 1 QPUB is transferred from the Pubcoin-owned Reserve Account for ACN to the Pubcoin Supply Account, and 99 QPUB are transferred from the Pubcoin-owned Reserve Account for ACN to the Pubcoin-owned Reserve Account for BCN. The result is that 1000 ACN are destroyed and 990 BCN are created. Carl ends up with 990 BCN extra.

**Balances:**

The QPUB Account on the Pubcoin Blockchain (Balances in QPUB)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for ACN</td>
<td>1,000,000</td>
<td>999,900</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for BCN</td>
<td>1,000,000</td>
<td>1,000,099</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,000</td>
<td>70,000,000,001</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

The ACN Account on the Pubcoin Blockchain (Balances in ACN)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>1,000</td>
<td>0</td>
</tr>
<tr>
<td>Alice’s Merchant Account</td>
<td>5,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>10,000,000</td>
<td>9,999,000</td>
</tr>
</tbody>
</table>
The BCN Account on the Pubcoin Blockchain (Balances in BCN)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>1,000</td>
<td>1,990</td>
</tr>
<tr>
<td>Bob’s Merchant Account</td>
<td>5,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>10,000,000</td>
<td>10,000,990</td>
</tr>
</tbody>
</table>

**Case 2: Origin Merchant Fee Only**

In this case, there is only one Merchant Fee, which is an \( x \% \) QPUB Fee, \( 5% \leq x \leq 95\% \). There is no 1% Conversion Fee.

Suppose Alice charges a 50% Merchant Fee and Bob does not charge a Merchant Fee. Here’s how it works:

**Assumptions:**

- Alice is a merchant with 5,000,000 ACN.
- Bob is a merchant with 5,000,000 BCN.
- Carl is an individual with 100 QPUB, 1000 ACN and 1000 BCN.
- The Pubcoin Supply Account starts with 70,000,000,000 QPUB.
- The Pubcoin-owned Reserve Account for ACN is 1,000,000 QPUB, so there are 10,000,000 ACN in existence.
- The Pubcoin-owned Reserve Account for BCN is 1,000,000 QPUB, so there are 10,000,000 BCN in existence.
- Alice charges a 50% Merchant Fee.
- Bob does not charge a Merchant Fee.

**Actions:**

Carl is converting 1000 ACN into BCN. 1000 ACN = 100 QPUB. Alice charges a 50% Merchant Fee, so no 1% Pubcoin Fee is charged. Because of the 50% Merchant Fee, 500 ACN goes to the Merchant Fee and 500 ACN actually gets converted. The way that 500 ACN actually gets converted is this: the 50 QPUB which back it are transferred from the Pubcoin-owned Reserve Account for ACN to the Pubcoin-owned Reserve Account for BCN. The result is that 500 ACN are destroyed and 500 BCN are created and credited to Carl’s Individual Account of BCN.

Of the 500 ACN which are in the 500 ACN Merchant Fee, they are split 30% to Pubcoin (150 ACN) and 70% to the merchant (350 ACN). Pubcoin does not store MCoin, so the 15 PUB that back the 150 ACN are debited from the Pubcoin-owned Reserve Account and credited to the Pubcoin Supply Account, destroying 150 ACN in the process. The 70% of the 50% Merchant Fee which is kept by the
merchant is kept in ACN, so 350 ACN are debited from Carl’s Individual Account and credited to Alice’s Merchant Account.

So, the total amount that the ACN supply decreases by is 650 ACN: 500 for the 50 QPUB moved from the Pubcoin-owned Reserve Account for ACN to the Pubcoin-owned Reserve Account for BCN and 150 for the 15 QPUB moved from the Pubcoin-owned Reserve Account for ACN to the Pubcoin Supply Account to pay the Pubcoin fee. Carl’s Individual Account of BCN gets 500 BCN and Alice’s Merchant Account gets 350 ACN.

**Balances:**

The QPUB Account on the Pubcoin Blockchain (Balances in QPUB)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for ACN</td>
<td>1,000,000</td>
<td>999,935</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for BCN</td>
<td>1,000,000</td>
<td>1,000,050</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,000</td>
<td>70,000,000,015</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

The ACN Account on the Pubcoin Blockchain (Balances in ACN)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>1,000</td>
<td>0</td>
</tr>
<tr>
<td>Alice’s Merchant Account</td>
<td>5,000,000</td>
<td>5,000,350</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>10,000,000</td>
<td>9,999,350</td>
</tr>
</tbody>
</table>

The BCN Account on the Pubcoin Blockchain (Balances in BCN)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>1,000</td>
<td>1,500</td>
</tr>
<tr>
<td>Bob’s Merchant Account</td>
<td>5,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>10,000,000</td>
<td>10,000,500</td>
</tr>
</tbody>
</table>

**Case 3: Destination Merchant Fee Only**

In this case, there is only one Merchant Fee, which is an $x\%$ QPUB Fee, $5\% \leq x \leq 95\%$. There is no $1\%$ Conversion Fee.
Suppose Alice does not charge a Merchant Fee and Bob charges a 50% Merchant Fee. Here’s how it works:

**Assumptions:**

- Alice is a merchant with 5,000,000 ACN.
- Bob is a merchant with 5,000,000 BCN.
- Carl is an individual with 100 QPUB, 1000 ACN and 1000 BCN.
- The Pubcoin Supply Account starts with 70,000,000,000 QPUB.
- The Pubcoin-owned Reserve Account for ACN is 1,000,000 QPUB, so there are 10,000,000 ACN in existence.
- The Pubcoin-owned Reserve Account for BCN is 1,000,000 QPUB, so there are 10,000,000 BCN in existence.
- Alice does not charge a Merchant Fee.
- Bob charges a 50% Merchant Fee.

**Actions:**

Carl is converting 1000 ACN into BCN. 1000 ACN = 100 QPUB. Bob charges a 50% Merchant Fee, so no 1% Pubcoin Fee is charged. Since this is the destination Merchant Fee, what happens is this: first the 100 QPUB are transferred from the Pubcoin-owned Reserve Account for ACN to the Pubcoin-owned Reserve Account for BCN. This destroys 1000 ACN and creates 1000 BCN. Of these, 500 BCN (50%) are credited to Carl’s Individual Account of BCN, and the other 500 BCN are the 50% Merchant Fee.

Of the 500 BCN which are in the 500 BCN Merchant Fee, they are split 30% to Pubcoin (150 BCN) and 70% to the merchant (350 BCN). Pubcoin does not store M Coin, so the 15 PUB that back the 150 BCN are debited from the Pubcoin-owned Reserve Account and credited to the Pubcoin Supply Account, destroying 150 BCN in the process. The 70% of the 50% Merchant Fee which is kept by the merchant is kept in BCN, so 350 of these new BCN are credited to Bob’s Merchant Account.

So, the total amount that the ACN supply decreases by is 1000 ACN, and the total amount that BCN supply increases is 850 BCN (500 for Carl’s new BCN and 350 for Bob’s new BCN). 100 QPUB are removed from the Pubcoin-owned Reserve Account for ACN; 85 QPUB are added to the Pubcoin-owned Reserve Account for BCN (50 for Carl, 35 for Bob); 15 QPUB are added to the Pubcoin Supply Account. As with all transactions on the Pubcoin blockchain, QPUB are neither created nor destroyed—just moved.

**Balances:**
The QPUB Account on the Pubcoin Blockchain (Balances in QPUB)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for ACN</td>
<td>1,000,000</td>
<td>999,900</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for BCN</td>
<td>1,000,000</td>
<td>1,000,085</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,000</td>
<td>70,000,000,015</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>

The ACN Account on the Pubcoin Blockchain (Balances in ACN)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>1,000</td>
<td>0</td>
</tr>
<tr>
<td>Alice’s Merchant Account</td>
<td>5,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>10,000,000</td>
<td>9,999,000</td>
</tr>
</tbody>
</table>

The BCN Account on the Pubcoin Blockchain (Balances in BCN)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account</td>
<td>1,000</td>
<td>1,500</td>
</tr>
<tr>
<td>Bob’s Merchant Account</td>
<td>5,000,000</td>
<td>5,000,350</td>
</tr>
<tr>
<td>Total (fluctuates)</td>
<td>10,000,000</td>
<td>10,000,850</td>
</tr>
</tbody>
</table>

Case 4: Two Merchant Fees

In this case, there are two Merchant Fees, which is an $x\%$ QPUB Fee, $5\% \leq x \leq 95\%$. There is no 1% Conversion Fee.

Suppose Alice and Bob both charge a 50% Merchant Fee.

Here’s how it works:

Assumptions:

- Alice is a merchant with 5,000,000 ACN.
- Bob is a merchant with 5,000,000 BCN.
- Carl is an individual with 100 QPUB, 1000 ACN and 1000 BCN.
- The Pubcoin Supply Account starts with 70,000,000,000 QPUB.
The Pubcoin-owned Reserve Account for ACN is 1,000,000 QPUB, so there are 10,000,000 ACN in existence.
The Pubcoin-owned Reserve Account for BCN is 1,000,000 QPUB, so there are 10,000,000 BCN in existence.

Alice charges a 50% Merchant Fee.
Bob charges a 50% Merchant Fee.

Actions:

Carl is converting 1000 ACN into BCN. 1000 ACN = 100 QPUB. Alice and Bob both charge a 50% Merchant Fee, so no 1% Pubcoin Fee is charged.

Because of the 50% Merchant Fee from Alice, 500 ACN goes to the Merchant Fee and 500 ACN actually gets converted. The way that 500 ACN actually gets converted is this: the 50 QPUB which back it are transferred from the Pubcoin-owned Reserve Account for ACN to the Pubcoin-owned Reserve Account for BCN. The result is that 500 ACN are destroyed and 500 BCN are created. These 500 BCN are what Bob’s 50% Merchant Fee apply to. So, of the new 500 BCN, 250 BCN go to Bob’s Merchant Fee and Carl’s Individual Account gets 250 BCN.

Note that both Alice’s Merchant Fee (of 500 ACN) and Bob’s Merchant Fee (of 250 BCN) are split 70/30: 70% to the merchant (Alice or Bob) and 30% to Pubcoin. So, Alice’s Merchant Account gets 350 ACN from Alice’s Merchant Fee, and Bob’s Merchant Account gets 175 BCN from Bob’s Merchant Fee. The remaining 30% of both Merchant Fees, 150 ACN from Alice’s Merchant Fee and 75 BCN from Bob’s Merchant Fee, go to Pubcoin.

These are the transfers which get produced. This is just a list of the transfers, not a strict sequence:

- 50 QPUB are transferred from the Pubcoin-owned Reserve Account for ACN to the Pubcoin-owned Reserve Account for BCN. When this happens, 500 ACN are destroyed and 500 BCN are created.
- 15 QPUB are transferred from the Pubcoin-owned Reserve Account for ACN to the Pubcoin Supply Account. This destroys 150 ACN.
- 350 ACN are transferred from Carl’s Individual Account to Alice’s Merchant Account. The 35 QPUB in the Pubcoin-owned Reserve Account for ACN which back these 350 ACN are untouched.
- 250 BCN (50% of the newly-created 500 BCN) are transferred into Carl’s Individual Account. The 25 QPUB in the Pubcoin-owned Reserve Account for BCN which back these 250 BCN are untouched.
- 175 BCN (70% of Bob’s 50% Merchant Fee on the transfer of the newly-created 500 BCN) are transferred into Bob’s Merchant Account. The 17.5 QPUB in the Pubcoin-owned Reserve Account for BCN which back these 175 BCN are untouched.
- 7.5 QPUB are transferred from the Pubcoin-owned Reserve Account for BCN to the Pubcoin Supply Account. This is the 30% of Bob’s 50% Merchant Fee on the transfer of the newly-created 500 BCN, which is 75 BCN.
This causes a number of changes on the various accounts.

The QPUB Account on the Pubcoin Blockchain (Balances in QPUB):

- The Pubcoin-owned Reserve Account for ACN decreases by 65 QPUB (50 QPUB transferred to the Pubcoin-owned Reserve Account for BCN; 15 QPUB transferred to the Pubcoin Supply Account).
- The Pubcoin-owned Reserve Account for BCN increases by 42.5 QPUB (25 QPUB for the 250 BCN that Carl’s Individual Account (BCN) gets; 17.5 QPUB for the 175 BCN that Bob’s Merchant Account gets.
- The Pubcoin Supply Account increases by 22.5 QPUB (15 QPUB for the 150 ACN from 30% of Alice’s 50% Merchant Fee; 7.5 QPUB for the 75 BCN from 30% of Bob’s Merchant Fee)
- Recall that QPUB are neither created or destroyed: -65 + 42.5 + 22.5 = 0

The ACN Account on the Pubcoin Blockchain (Balances in ACN):

- Carl’s Individual Account (ACN) decreases by 1000 ACN.
- Alice’s Merchant Account increases by 350 ACN for her Merchant Fee.
- Recall that the supply of ACN (like all MCoin) fluctuates, so the total decreases by 650 ACN.

The BCN Account on the Pubcoin Blockchain (Balances in BCN):

- Carl’s Individual Account (BCN) increases by 250 BCN.
- Bob’s Merchant Account increases by 175 BCN for his Merchant Fee.
- Recall that the supply of BCN (like all MCoin) fluctuates, so the total increases by 425 BCN.

Balances:

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account (QPUB)</td>
<td>100</td>
<td>100.0</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for ACN</td>
<td>1,000,000</td>
<td>999,935.0</td>
</tr>
<tr>
<td>Pubcoin-owned Reserve Account for BCN</td>
<td>1,000,000</td>
<td>1,000,042.5</td>
</tr>
<tr>
<td>Pubcoin Supply Account</td>
<td>70,000,000,000</td>
<td>70,000,000,022.5</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total (invariant)</td>
<td>100,000,000,000</td>
<td>100,000,000,000</td>
</tr>
</tbody>
</table>
### The ACN Account on the Pubcoin Blockchain (Balances in ACN)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account (ACN)</td>
<td>1,000</td>
<td>0</td>
</tr>
<tr>
<td>Alice’s Merchant Account</td>
<td>5,000,000</td>
<td>5,000,350</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td><strong>Total (fluctuates)</strong></td>
<td>10,000,000</td>
<td>9,999,350</td>
</tr>
</tbody>
</table>

### The BCN Account on the Pubcoin Blockchain (Balances in BCN)

<table>
<thead>
<tr>
<th>Account</th>
<th>Initial Balance</th>
<th>Resulting Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl’s Individual Account (BCN)</td>
<td>1,000</td>
<td>1,250</td>
</tr>
<tr>
<td>Bob’s Merchant Account</td>
<td>5,000,000</td>
<td>5,000,175</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td><strong>Total (fluctuates)</strong></td>
<td>10,000,000</td>
<td>10,000,425</td>
</tr>
</tbody>
</table>

This conversion is very costly for Carl. But at least the percentages multiply instead of adding—otherwise Carl would have nothing at all!
Legal Disclaimers

Pubcoin tokens on the public Ethereum blockchain (PUB) and on the permissioned Pubcoin blockchain (QPUB) are NOT securities.

Purchasing PUB or QPUB does NOT result in any equity ownership in Pubcoin, Pubcoin.com, Ruboss Technology Corporation (“Ruboss”) or Leanpub. PUB and QPUB are not participation in Ruboss, and PUB and QPUB hold no rights in said company.

QPUB are functional utility tokens within the Pubcoin.com platform. PUB are simply a convenient way to acquire QPUB. PUB and QPUB are sold as a functional good and all proceeds received by Ruboss may be spent freely by Ruboss without limitation.

PUB and QPUB are not for speculative investment. PUB are simply a way of purchasing QPUB in the Token Sale, and are intended for conversion into QPUB at a 1:1 ratio.

PUB and QPUB are non-refundable. PUB and QPUB are intended for experts in dealing with cryptographic tokens and blockchain-based software systems. No promises of future performance or value are or will be made with respect to PUB, QPUB and the Pubcoin blockchain, including no promise of inherent value, no promise of continuing payments, and no guarantee that PUB or QPUB will hold any particular value.

Ruboss, its officers and employees make no promises and will make no promises of future performance or value with PUB or QPUB.

This whitepaper makes a number of forward looking statements, which Ruboss may lack the financial and technical resources to accomplish. Furthermore, the regulatory environment may change, meaning that Ruboss may be unable to meet its goals in this whitepaper solely due to the regulatory environment.

PUB and QPUB have a number of risks. These include, but are certainly NOT limited to, the following:

1. You may lose access to your PUB if you lose your private keys for your account on the Ethereum blockchain. You may lose access to your QPUB if you lose your account information with Pubcoin.com.
2. The Ethereum protocol may suffer malfunction, software bugs or other unforeseen behaviour which causes Pubcoin.com, PUB or QPUB to perform in an unexpected or unintended manner. Furthermore, the technology behind Ethereum may be vulnerable to advances (either new or undisclosed) in cryptography or quantum computing, meaning that the entire technical underpinning of Ethereum may be suspect.
3. Ether, the native token of the Ethereum public blockchain, may lose value during or after the Token Sale. This may affect Ruboss’s ability to convert the proceeds of the Token Sale into Canadian dollars (CAD) and make effective use of them.
4. The regulatory environment around Token Sales and Ethereum may change before, during or after the Token Sale. This may affect the future of Pubcoin, PUB and QPUB.

5. There may be a lack of interest in PUB and QPUB by publishing industry partners. This could cause a lack of a market for PUB and QPUB and a glut of supply.

6. Publishers or marketplaces (e.g. Amazon) may develop their own competitor to PUB and QPUB.

7. The PUB and QPUB held by Ruboss may be stolen or hacked in any number of ways. The threat of sophisticated cyberattacks is both real and increasing.

8. The ETH, PUB and QPUB held by Ruboss or other parties will be uninsured.

9. Although Ruboss was founded in 2007 and Leanpub was launched in 2010, Ruboss, Leanpub or Pubcoin may cease to be a viable business and may be shut down (or Pubcoin fail to launch) due to a variety of unforeseen factors. This would have a negative impact on the value of PUB and QPUB.

10. If it gets ruled that PUB or QPUB are securities (before or after Token Sale completion), then all funds received in the Token Sale will be returned proportionally, minus costs, to purchasers at a best effort basis and Pubcoin will be shut down.

This is a partial, incomplete list of risks. There are probably hundreds of discrete risks with Pubcoin.