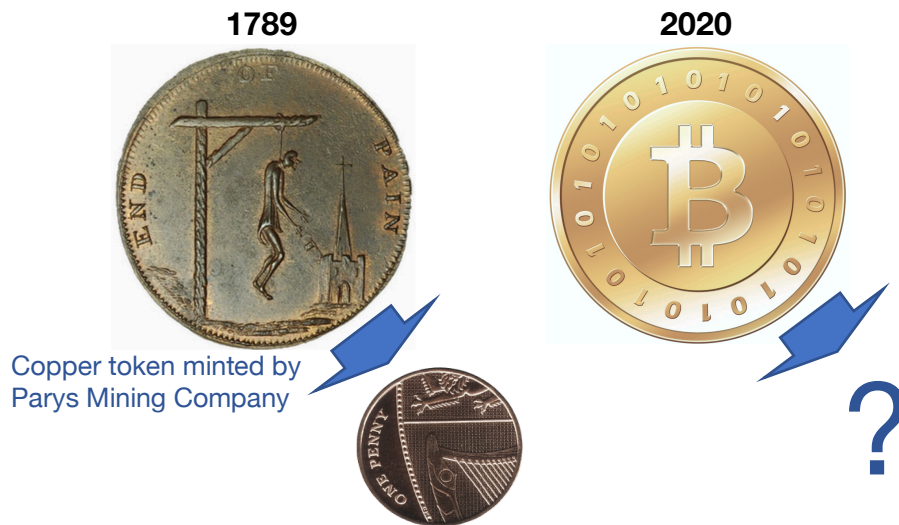


## Before and Beyond Bitcoin

### 1. Lessons from the first fintech in 18<sup>th</sup> century Britain

A little-known history of private currency innovation might provide clues as to where Bitcoin is headed.



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## Quick take

### How will Bitcoin and other cryptocurrencies evolve and what state responses will ensue?

Private tokens and ledgers that have popped in and out of existence since the beginning of recorded history may offer some important lessons for the future of cryptocurrency. **To understand Bitcoin's potential future, it may be useful to understand what came before.**

- For much of Britain's post-Roman history, there was a lack of small coinage for marketplace transactions, which required market transactions to be necessarily local, and based on seller trust and credit.
- An economy based on local credit and personal trust could not provide a monetary basis for the nascent industrial revolution, where small anonymous payments were required by employers and workers, alike.
- The **world's first successful fintech solved a government failure** in 19<sup>th</sup> century Britain by providing adequate small change for the new industrial working classes to be paid in and to pay for provisions.
- Private token coins were used in place of official money at times, but before the 1780s tokens were easy to copy, while it was illegal to copy official coinage.
- A new **technology**, the steam press – solving the usually overwhelming problem of establishing trust in money – was used to provide mass-produced small token coins to be used to pay wages and to provide for the new industrial working class, successfully mitigating a potential disaster for millions of wage-earning Brits and their employers.
- Private enterprise addressed a state failure with entrepreneurship and technology with the state looking on as observer.
- As the private sector's efforts gained in popularity, the solution and the underlying technology were both eventually monopolized and adopted by the state, and live on to this day as the British copper penny.
- Will history repeat?

### ***About this series***

This essay is the first in the *Before and Beyond Bitcoin* series. The series is based on ideas the author first explored in Chambers, Saleuddin and MacMahon “Alternative finance: An historical perspective” (2019) *Financial History Review* and in an upcoming chapter in Rau, Wardop and Zingales, *Handbook of Technological Finance* (2021, forthcoming). Those interested in the historical details can find them **there** and in the references at the end of each paper.

History is used as a guide to develop a model of private actions and government responses in the realm of private currency, with this model then applied to new conceptions of digital money, including Bitcoin.

### ***About the series author***

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The sovereign state almost always exercises a monopoly on the issuance of currency. Throughout history, however, there are many instances of states failing to provide a useful medium of exchange, store of value or unit of account. This failure could be due to ignorance, but more often the state gets captured by economic elites who benefit from currency problems. In other cases, failures are due to the limitations of metallic or fiat money. State actions that can limit the scope and/or effectiveness of state-issued currency or, worse still, directly harm a state's citizens include:

- Surprise devaluations, redenominations or wholesale changes in the currency of the state that could quickly render money used by the average citizen worthless. India's 2016 demonetization is a very recent example of this.<sup>1</sup>
- Over-issuance of money creating a near-worthless currency with immense costs to holding local fiat cash due to (hyper) inflation. Basic financial transactions are no longer possible. The poor whose main asset is cash suffer more than elites who own real assets at home, and both financial and real assets abroad. Recent action in 2000s Zimbabwe, 1990s Argentina and the 1920s German Weimar Republic offer cautionary tales.
- Governments and their citizens can fall prey to global currency hegemony, who place sanctions on the use of their currency in, for example, international trade and finance. Such sanctions hurt the poor the most in, for example, 1990s Iraq.

Currency-related state failures could be catastrophic. Hyperinflation, for example, completely shuts down all aspects of commerce and finance, as currency cannot be used at all as a (stable) unit of account or a store of value, and only wheelbarrows of cash allow for its use as a medium of exchange. Barter becomes preferable if possible, though many market transactions are impossible.

### ***"The want of small change"***

The most common state failure in pre-modern times was a result of government **unwillingness to provide smaller coinage needed for individual market transactions**, such as purchasing a loaf of bread or paying a laborer for a day. Where all economic transactions are local, credit ledgers can be used to keep track of flows, mitigating some of the negative consequences of the lack of physical media. In ancient Roman markets, vendors kept the ledgers, as they personally knew their customers. Ledgers in this case were required as the long iron bars that passed for small change were not easy to cart about on shopping days! In the Middle Ages, British churches acted as centralized trustworthy ledger keepers. Unfortunately, ledger credit systems are useless for those without shared trust (in each other or with the ledger). Anonymous transactions become impossible without a shared medium of exchange.<sup>2</sup>

The resulting "want of small change"<sup>3</sup>, among other serious problems, limits the ability of labor to freely contract with employers. It is indeed difficult to imagine that the British industrial revolution could have occurred without a means to pay workers, and for those workers to pay merchants for food and other necessities.

A compelling example of the negative influence of the lack of small currency exists in plantation economies such as that of the post-bellum US South. Newly-freed slaves remained effectively tied to the land and without economic opportunities, a re-enslavement, as the lack of small change allowed companies and landowners to pay workers in scrip redeemable only at their own stores. This

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<sup>1</sup> See, for example, <https://www.project-syndicate.org/commentary/india-demonetization-policy-consequences-by-shashi-tharoor-2016-12>

<sup>2</sup> For very long-distance transactions, metal (or fully metallic coins) or credit between those with shared trust (such as within one family) are necessary. Medieval "Champagne fairs" evolved into meetings where complex (multi-currency) credit agreements as a result of international trade were regularly unwound and offset. See De Roover, 1953.

<sup>3</sup> Williamson, 1889.

state failure tied sharecroppers to their land, resulting in a genuine restraint of trade and basic human rights, with catastrophic effects.<sup>4</sup>

In modern times, private entrepreneurship continuously seeks new opportunity, and, unsurprisingly, private solutions to state failures involving small coins have been common throughout history. Some of these were patently illegal, such as counterfeiting. Other solutions included importing and using foreign coins (Spanish silver was commonly used in 19<sup>th</sup> century US, and Japan regularly used Chinese coins, especially at harvest time) or issuing private-use tokens good for the use at a single enterprise (e.g. railway or subway tokens).<sup>5</sup>

When such tokens crossed over into general usage, however, their legal grounding became suspect. In some cases, states clamped down on currency entrepreneurs that attempted to compete with the state's monopoly. At other times, the state initially felt unthreatened or were ignorant of the private solutions. As a result, **privately-issued currencies have existed - and often thrived - in many eras** and in many countries over the past few millennia, ranging from Ming Dynasty to 20<sup>th</sup> century China, ante- and postbellum US and a long Medieval to early modern period in Britain. Large swathes of society have often relied on private token currency as well as privately-held ledgers (more likely for those who shared a common location or culture) as media of exchange for goods and services.

Private sector attempts are inherently limited in their ability to fully compensate for state failures, generally because private issuers can rarely overcome distrust in the general populace. In more local settings, or where the alternative was bleak (e.g. during a war), private currency could function for a time, but these solutions were generally not scalable enough to be state-wide long-term solutions.

### ***Bitcoin as private solution***

For ardent followers, the adoption of **Bitcoin** is a direct result of government failures, addressing private concerns over hegemonic control (by states but also by the oligopolistic banking sector), privacy and inflation.<sup>6</sup> What makes the solution scalable is the cryptographic trust mechanism that makes cryptocurrencies censorship-resistant, subject to rules on money growth, decentralized and reasonably private. **Bitcoin can be thought of as both a token** (so a unit of account, a store of value and a medium of exchange) and a **ledger** (a way of recording exchanges).

Bitcoin is, however, not the first, nor likely the last, private currency solution that relied on new technology as a trust mechanism to address problems with our monetary system, even if Distributed Ledger Technology (DLT) is revolutionary from a technological point of view. I suggest, therefore, that past experiences with Bitcoin-like solutions throughout history can offer some lessons and insight into the possible future of cryptocurrency. The rest of the essay covers but one example of a private solution that was allowed to evolve through England in the late 18<sup>th</sup> century.<sup>7</sup>

### ***1780s Britain and the world's first fintech***

From pre-Norman times to the early 19th century, post-Roman Britain, like many countries, had to function economically without small coins to use in market transactions. Its pre-industrialized economy was mostly non-market based and the few market transactions were local. Private centralized ledgers, dependent on trust between counterparties, took the place of coin.<sup>8</sup>

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<sup>4</sup> The effects of the lack of small coin on emancipated slaves in the US South continued into the 20<sup>th</sup> century. See Lurvink, 2014. This also occurred in plantation economies in Puerto Rico, South Asia and Southeast Asia.

<sup>5</sup> Kuroda, 2005; Timberlake, 1981.

<sup>6</sup> The extent to which “maximalist” arguments that BTC is a solution to privacy and government interference issues as well as being a useful currency has been long-debated and is therefore not reprised here.

<sup>7</sup> Others to be covered in part II.

<sup>8</sup> Muldrew, 1998.

Very small change was mostly non-existent for most of Britain's history. Silver coins small enough to be used in everyday transaction were easy to lose, when they actually could be found in the first place. It was often in the interests of the rich to melt and/or export silver coins for much of this period. Weak demands by the poor for currency that they could use but that also could be exchanged for larger denominations were ignored by the elites and the British state who saw only gold, and occasionally silver, as useful money.

The Great Recoinage of Elizabethan Times finally destroyed the remaining inadequate stock of small-ish silver coin, upon which the factory owners, brewers, mines and their employees were reliant to grease the wheels of commerce. As a result, for small transactions between relative 'strangers', clipped old coins and foreign coins were all that was available.

A shortage would have been catastrophic for the industrial revolution, where former agricultural "smallholders" were forced from their lands, entered new workplaces and needed to be paid in small amount per week, and where they in turn need to buy provisions on an almost daily basis. Indeed, it is not an overstatement to say that "the coin shortage threatened to delay, if not halt, the process of industrialization."<sup>9</sup>

Patchwork solutions for the lack of small coin were many. Payment in kind (tools, factory output), or in tokens for use only in company stores or other affiliated suppliers (e.g. the local tavern) were used by the larger employers. Such pay methods often tied the workers to the mine or factory, with the fruits of one labour only available to be spent at restricted locations where credit or tokens issued by the employer were accepted. In other cases, employers would simply not be able to pay or pay only once the obligation was large enough to be paid with good silver coin of the realm, and workers resorted to criminal activity, including stealing inventory and finished products from their paymasters.

At many points in this history up to the late 1700s, private individuals and companies stepped in to produce their own small change, either as counterfeits or as so-called "evasions", the latter not designed to accurately mimic official currency. Other tokens issued by merchants, taverns and brewers, could be of tin, copper or even paper. The provision of such private currency before the mid 1770s was highly localized. Brewers, for example, would issue tokens redeemable on demand at their establishment. They could not generally be used further afield than the one or two square blocks of London, or a small village. Whether by credit or with small tokens, transaction could only remain local.

By the mid 1780s, entrepreneurship and invention joined forces to solve the severe country-wide problem of the lack of small coins. The owner of the largest copper mine had the metal but not the currency to pay his workers. Using the crude methods of the day, the company minted enough coins for its own use, but there was such a pent-up demand that they quickly circulated widely across England, and once again there were shortages at the source. To truly meet the needs of the population, token production needed to be both scalable and trustworthy.

Enter the steam press, new technology for minting coins invented by Matthew Boulton. Such tech allowed for the fast production of standardized size and weight coins – with edges – that were difficult to counterfeit. With the steam press ensuring scalability and uniqueness, the Parys Mine Company of Anglesey Wales, and several large competitors were able to supply all the tokens

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<sup>9</sup> Selgin, 2008.

needed for the industrialized economy to function.<sup>10</sup> Millions of coins such as the one shown here were minted: One issuer minted three hundred tons, at 600+ coins per minute.<sup>11</sup>



Copper Token issued by Parys Mine Company, Anglesey courtesy of the Fitzwilliam Museum Cambridge (Photo by author).

Where was the government during all of this private encroachment on the state monopoly? As a perfect illustration of the initial lack of government interest in new technology, the British state actually refused to get involved with either small change or the steam press when explicitly offered the opportunity. Instead, the British parliament adopted a *laissez faire* approach to the private issuers, as the private actions did not threaten elites nor the government. The result was a true private and parallel currency, with the small privately-manufactured change not generally exchangeable for state-issued money.<sup>12</sup> The private solution was far from perfect. Token holders were never sure of their rights of exchange and the value of the holdings – they could (and did – eventually) become worthless over time.

After monitoring the market but maintaining a *laissez faire* attitude to innovation, the government finally had to do “something”. While there were the consumer protection issues as the tokens were often unexchangeable at source, there is seigniorage in coinage: it’s cheaper to make token coins (cheaper by ‘weight’) than they are worth at their stated fair value. The state wanted control of that profit.

Under this guise of consumer protection, attempts were made at restricting the private tokens without providing any replacement. Eventually, however, the state had to replace the private solution with their own. It was simple for the government to monopolize the issuance of small coins: They eventually simply hired Boulton’s mints and his competitors to make official small coins. The tokens minted by Boulton and others were simply replaced by a state-sanctioned equivalent. This new official British copper penny that survived into the 21<sup>st</sup> century fixed all the flaws of the private equivalent. Exchangeability for other coins and for goods and services was now guaranteed.

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<sup>10</sup> Sargent and Velde, 2014: 302.

<sup>11</sup> Selgin, 2008.

<sup>12</sup> Such parallel solutions were common throughout history.

### **Key takeaways**

The history of 18<sup>th</sup> century private copper token coinage is in itself an interesting and informative case which demonstrates how entrepreneurship and technological innovation can together solve failures of the state, while also offering an example of how states respond to such private solutions. The most important lesson here is perhaps that a state cannot be relied on to provide critical tools for the economic health and wealth of its citizenry. **The poor had to suffer for years before the government caught up to demand. Needs were ignored and, once the private solution grew “too popular”, maintaining the state monopoly was more important than meeting critical needs of the people.**

There are similar histories from other times and in other countries with similar parallels as regards state failures, private innovation and state response. In part 2 of this series I show that such private currency solution can be fit into a more general model of public failure and private trust. Bitcoin, itself, can be fit into this model.

### **Beyond Bitcoin?**

Like 18th century tokens, BTC utilized the latest technology to mitigate government and market failures. Bitcoiners do not trust the state to provide an inflation-proof stable currency. They do not trust the state with the power to seize assets, or the power to permit or deny access to the international financial system at their whim.

Can the history of copper token coinage provide any insight into the possible future of cryptocurrencies and their regulation? Obviously, “history may not repeat, but it does rhyme”. The parallels seem more than coincidental, as is shown in the Figure below.

If you find such parallels convincing, then you probably agree that governments have the following possible responses to BTC:

1. continue to monitor and control only the interaction of crypto with the traditional monetary system;
2. over-regulate or (attempt to) ban the use of cryptocurrencies; and/or
3. create their own crypto or increasingly digital variant of current fiat.

If BTC follows the evolution of private solutions similar to the case study above, domination by Central Bank Digital Currencies (CBDC) and over-regulation by national governments are the likely outcomes. Goldman Sachs CEO Lloyd Blankfein recently said “If I were a regulator I would be kind of hyperventilating at the success of [crypto] at the moment, and I’d be arming myself to deal with it.” Even if a ban is not possible, governments can throw up a number of high hurdles, especially in the crypto/fiat on and offramps. At the same time, we can see central bankers strongly hinting that, while the revolutionary technology of Bitcoin is “here to stay”, CBDC operating using the new tech will likely replace BTC in the near future.<sup>13</sup>

If and when BTC truly threatens state monopoly and power, is there any chance that the states will not respond?

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<sup>13</sup> See “Resetting Digital Currencies” panel, Davos 2021, for example.



<u>PARALLELS?</u>	1787 Britain	2021
<b>State failure</b>	Failure to provide small coins for market transactions	Failure to provide censorship-resistant, inflation-proof anonymous digital money
<b>Private solution</b>	Copper tokens	BTC
<b>New technology</b>	Steam press	Open, permissionless blockchain
<b>Initial state reaction</b>	Laissez faire	(Mostly) laissez faire
<b>Result</b>	Widely accepted as parallel currency	?
<b>State reaction to success</b>	(1) Banning of private solution  (2) Remonopolization of small coins <b>by adopting the new technology</b>	(1) Possible ban or over-regulation?  (2) CBDC?

### **Further reading and references**

*Good money: Birmingham button makers, the Royal Mint, and the beginnings of modern coinage, 1775-1821* (2008) is **George Selgin**'s excellent and very readable history of 18<sup>th</sup> and early 19<sup>th</sup> century British private tokens. Private enterprise triumphs in the face of state failures, until remonopolization.

**Thomas Sargent and Francois Velde** in *The big problem of small change* provide a history and formal explanation of the shortage of smaller-denomination currency and the effects it might have had in Europe between 1300 to 1850. There is very little focus on private currencies, however, and the analysis is not extended to Asia or America.

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