On The Money

The introductory TL/DR version

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A qualitative theoretical deep dive into the origins and nature of monetary value amidst the puzzling rise of cryptocurrencies

Blockchains, smart contracts, miners, ASICs, nodes, ICOs, tokens, hacks, soft forks, hard forks, spin offs, splits, clones, halvings, hashrates, singlesigs, multisigs, POW, POS, 51% attacks, scaling wars, altcoins, pump, dumps, ponzis, pyramids, bubbles, moons, lambos... As we approach the tenth anniversary of the crypto bull tiptoeing into the financial china shop and slowly but surely starting his rampage, we have spent too much time this first decade discussing esoteric technologies, instant millionaires, billionaires, and common market manipulations, and not nearly enough time focusing on and understanding the multi trillion dollar mammoth in the room: **wealth storage via highly immutable digital scarcity**. This might be because blockchain technology is presumably cool and disruptive and silicon "valley-ey" but money is presumably boring and crude and "1%-ey". But of all the things cryptocurrencies can be, this is the big one, by orders of magnitudes. Why? Let's consider a few very rough figures.

There is some $300 trillion equivalent of intrinsic value (IV) in the world (GIV), of which mainly over $ 215 trillion is in real estate and $75 trillion in stocks. This does not including a host of other things such as private equity, commodities, arts and collectibles, IP etc which I suspect are somewhat smaller. This is the value of the things with actual real world utility. Acquiring a piece of this GIV pie is the true and only relevant end game of any economic actor.

In addition, there is (coincidentally) just about as much monetary value (MV) stored in all sorts of things. It is stored in obvious things we like to call money such as fiat instruments, either directly in cash itself and fiat federal debt instruments or indirectly in private forms of fiat debt. It is stored in some less obvious ones like precious metals and luxury real estate, and in some even less obvious ones like art and collectibles. All together this adds up to some $300 trillion of global monetary value (GMV).

MV simply acts as something that can be potentially redeemed for IV at any given time. In other words, it is a virtual scorecard to claim IV at some point in the future. It is held by people (or their lucky descendants) that have previously surrendered some IV, hoping to get at least as much back in the future. Its only role is to act as an IV reallocation mechanism. This MV is generally (but not always) stored in things generally referred to as money.

Some people will tell you that good money needs to serve three main functions: a store of value, a unit of account and a medium of exchange. This isn't wrong. But while you can debate whether the latter two functions are more of a requirement or a correlation of sustainable MV (I generally suspect the latter), from an economic valuation perspective they are basically irrelevant. Because the great bulk of MV sits in various forms with a medium to long term investment horizon. And the only thing that truly matters to the holders of MV, aka monetary investors, is the capacity of the monetary assets they have chosen to maintain their value over that time frame. On the rare occasion they need to hold some transactional money, they will sell a treasury bond, or a bit of gold, or go to Christies and auction off a Picasso and buy another little pile of some of those dollars you can use to actually buy coffee or that new condo in Florida. But the rest of their MV happily sits idle performing the bulk of MV's main and almost entire purpose: non short term value storage.

Now MV is a puzzling phenomenon to most of us we sort of have an intuition about but don't really get. We use trivial analogies, "money is like gold" or we skim the surface by calling it things like "a collective delusion". But those are simplistic and very unsatisfying cop outs. They don't explain where MV comes from, how it sustains itself and in which forms. Which is kind of nuts! This is the biggest market in the world and the greatest brick in the macro economic infrastructure and it should be much better understood by way more people, especially by a lot of very smart people that should clearly know better. So let's break it down.

Anything with any economic value is an asset. This can be commodities, precious metals, arts and collectibles, stocks, loans, IP, bonds, real estate, cash etc. Assets build economic value when they are in limited supply and experience demand. As we've discussed, there are two main sources of that value: IV and MV.

IV is the traditional intuitive one. People looking to acquire an asset for its utility generate intrinsic demand (ID) for it, increasing its IV through standard intrinsic supply and demand. But people instead looking to acquire an asset not because they are looking to ever use it, but only to redeem it at a further point in time for something they'll need then, in other words as a vehicle to store economic value, generate monetary demand (MD) for it. **This additional demand is of a monetary not intrinsic nature**, and it increases the value of that asset through the same supply and demand mechanism that gave it IV through ID. This additional value is MV. This is the one we have such a hard time grasping. In other words, the total economic value of any asset is IV + MV, resulting from an equilibrium between a common supply but distinct intrinsic + monetary demands. MV and IV are two fundamentally dissociated sources of asset value. **They do not overlap**. In other words, MV is economic value decoupled from IV, **by construct**. And what is that generally called? **A BUBBLE.**

MV is the classic definition of a bubble, value that is not attributed to intrinsic utility. But this is not a flaw! This is its true nature. MV is a self sustained bubble in the classic understanding of the word, by construct. Bubbles are real phenomena but they are routinely conceptually abused by various market participants to discredit economic assets of which they want to see the value go down (for all sorts of reasons, sometimes justified). But claiming a monetary asset is gaining value only because it is in a

bubble, implying it will inevitably eventually pop and come crashing down, is missing the point entirely. **It's calling money what it is**. That monetary asset is doing exactly what it's supposed to be doing.

And anything that can be acquired can be used for money. ANYTHING. A monetary asset is born the moment someone acquires it for that purpose alone. There is no fundamental truth of the universe that says you should use dollars or gold or art or sea shells or large stones or anything else. The question is never whether something is money. Anything is money to anyone who has chosen it to be. There is only one relevant question for a monetary asset's owner and its owner alone: will someone else chose it in turn in the future for himself and pay for it as much or more as he did. The willingness to part with IV in exchange for a monetary asset is entirely based on faith and / or hope in someone else's similar willingness in the future. Nothing more.

In other words while monetary assets have the appearance of debt, a kind of record of IV owed their holders by society for past IV they gave up, **MONEY IS NOT DEBT, MONEY IS A BET**. More specifically, money is a double bet. The first bet is that there will be monetary savers in the future. If overnight MD fell to zero, GMV would be wiped off the face of the earth, and its owners would have given up that much IV in the past for nothing. The second bet is that future monetary savers will choose to save in the same monetary assets GMV is currently invested in. If they were to ask for alternatives, the ones falling out of favor would lose all their MV, at the expense not of society as a whole but of the monetary savers that chose that particular monetary asset.

Now if a particular asset experiences a lot of MD its MV will potentially grow materially beyond its IV. This is the main part people struggle with. We have a very difficult time comprehending sustained value in something that does not have real utility, in other words, sustained bubbles. But it works. Tremendously well. Why? Because we are sheep. And I say that in a positive sense.

The monetary adoption of a particular asset is sustained mainly through herd behavior: self reinforcing societal feedback loops of abstract beliefs, such as religion. Through this mechanism, people don't generally trust a dollar or an oz of gold will hold their value because they've put any particular thought into their inherent qualities as monetary assets, but because they observe the value is holding well, because they see it being reliably accepted by other people, and because a lot of people are telling them that they will. And aggregating all those factors, they naturally expect that to last, without even thinking about it much, even though those things tend to be 0s and 1s on computer servers, or pieces of paper with dead presidents on them.

This is a genetic trait of all societal species. Our basic intuitions drive us to act like sheep. This sounds bad, and it has plenty of drawbacks, but it's overall very useful and society could not function without it (if this weren't the case societies wouldn't have evolved that way). This is what drives dominant abstract beliefs to take hold, two of the biggest categories being religions and currencies through what are commonly known as network effects.

The world's monetary assets come in many forms and they are in constant competition with each other for a piece of the GMV pie which hopefully they'll be able to redeem for a piece of GIV. **It is entirely a**

relative game which is in constant fluctuation. If tomorrow everyone decides that gold should be the only worthy monetary asset in the world after all, gold's market value will shoot up to $ 300 trillion from around $ 8 trillion and all other monetary savers will have 0. The gold owners will have made a killing at the expense of all other monetary savers. If however they decide metals are so 16th century and it's time to finally move on, gold's MV will go to 0 at the expense of gold savers and the benefit of non gold monetary savers.

The non monetary savers however will generally not care one bit (all else equal, setting aside notably the impacts of increased wealth inequality which this would surely trigger). In other words, if you are a monetary saver, you better choose your champion (or team) wisely. Because getting the biggest piece of GMV is your entire game. How much of GIV can be claimed by GMV is out of the hands of monetary savers. It depends entirely on monetary saving demand in the world and they have no control over that.

The assets that end up experiencing the greatest monetary adoption tend to do so through two main vectors: via regulatory pushes from large governments, eg the leading fiats today, and / or by providing superior monetary qualities. A digital asset for example is more convenient than gold, which is more convenient than perishable agricultural commodities. Once established as a dominant monetary asset, such asset's position becomes highly entrenched through network effects.

From a functional perspective, the ones that do best need to do two main things. First of all they need to be easier to store, divide and transfer, and in our day and age that means they need to be digital. And second of all, they need to be reliably scarce, because their economic value results from a supply demand imbalance. If the supply grows, the unit value goes down. You can't control the demand part, but you can gauge the supply. Supply is half the battle and the only battle monetary savers have a say in.

In other words, the holy grail for monetary assets, not necessarily from a macroeconomic or societal point of view but specifically and crucially from the monetary investors point of view, is **DIGITAL SCARCITY**. Up till today, we had digital with fiat currencies, and we had fairly reliable scarcity with precious metals (imperfectly), but we never had both. Now we do. I've unfortunately misplaced my crystal ball, but I'll go out on a limb and suggest there's a really good chance this is a monstrous deal.

Forget all the confusing techno babble you might have been exposed. Here's the main thing you need to understand about cryptocurrencies. **Cryptocurrencies are decentralized digital money with virtually uncompromisable predetermined supply and transmission mechanisms**. These are new features that were previously not to be found in any other potential monetary asset making them groundbreaking new monetary candidates with the potential to conquer a material portion of GMV. They are functionally speaking a monetary saver's holy grail form of money.

Now technically, cryptocurrencies are candidates to do mainly three things, money, value transfer disintermediation and utility sharing. The last two, while very interesting, highly disruptive and more creative and technologically edgy, are fascinating in their own rights. But they are going to provide some higher efficiency within that $75 trillion stock market valuation, meaning their target market is some fraction of that. For them to make their place, they will have to provide at least as much utility in the

specific fields of value transfer disintermediation and utility sharing at materially lower cost, meaning their economic value will be materially smaller than just those. So the corresponding valuation should turn out to be some small fraction of some fraction of $75 trillion. The first however, taps into a market 4 times the size and does not have to provide a materially higher value proposition at a fraction of the cost. Its value proposition is wealth storage itself and if it succeeds it will be worth a material fraction of $ 300 trillion.

In other words, while the rest is definitely very interesting, and has potentially tremendous implications, MV is the titan here. And if you're a monetary saver, the question isn't whether you can afford to invest in cryptocurrencies, but whether you can afford not to. Because currently at some 0.1% of GMV, cryptocurrency valuations remain a tiny dot on the radar, (but a shockingly large one if you consider how obscure and recent they are). But if cryptocurrencies do take hold and become dominant monetary assets, they still have a factor of at least 100 to go and we are about to witness the greatest monetary wealth transfer in history, by orders of magnitudes.

I have been thought obsessing over MV for some years now, because I found it to be the most fascinating economic animal there is. And in the current context of the advent of cryptocurrencies, I ended up writing what turned out to be a too long for most people version of this, and decided to offer up this highly condensed version as a TLDR / introduction to the final outcome of this effort. The final version can be read straight through, or cherry picked from. The sections tend to stand on their own. The major topics are the origins and nature of MV in much more granular detail, the psychological effects behind herd behavior and network effects, bubbles and ponzis, cryptocurrencies, the indirect form of money that is private debt, the direct form of money that is fiat debt and a final section with general comments.

My goal through this effort is to elevate the conversation regarding MV specifically, to finally recognize it for what it is and get past basic intuitive discussions on the matter (basic intuition tends to be awful at dealing with complex phenomena you haven't specifically thoroughly reflected on). A major central bank official recently joined an eye rolling litany of colleagues calling Bitcoin "probably a bubble". This would be bad enough, if only he weren't himself responsible for overseeing the top or second greatest monetary asset, ie bubble, in the world. It is bewildering to me (but not entirely surprising) that the top officials overseeing the top monetary assets of the world demonstrate such a chronic misunderstanding of monetary assets and value themselves. You can read the seeds of doubt in the use of "probably" though. Is he possibly starting to have subconscious doubts about what euros are? If I can at least elevate the debate to stop using bubble as a disqualifier for a monetary candidate and move on to general arguments as to why it might make for a good or bad one, I will be happy enough.

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The rather (probably too) long version

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Introduction

Unless you've been living under the proverbial rock for the past decade, you've probably been confronted to the advent and rise of cryptocurrencies and with it the myriad of unsatisfactory explanations by no less puzzled and all too often self proclaimed "experts". These explanations tend to be unsatisfying for two main reasons.

The first is that it is a recent phenomenon born out of a complex assembly of esoteric technologies leading its early proponents to have a tech background making them remarkably unqualified to explain things to you. You might for example have been exposed to something like this verbatim video interview excerpt of an "expert" in 2017 on a well followed news platform.

Interviewer: Can you help me understand what bitcoin is? Is it a currency? Is it an asset? Why do we compare it to gold? Like why is that a fair comparison? And what is gold? Is it a commodity? Is it a currency?

Interviewee: Yeah it's a great question because I think, as a primer, someone has to finally accept what bitcoin represents. And what it is, is at the core, it is just a very well designed database. One that because of the way the encryption is built into it, is very hard to crack. So unlike typical databases where, the encryption key is held by a central entity, bitcoin has this thing called miners and nodes. That each of the nodes keeps a copy of this database, and therefore you need 51% of the nodes to agree on a transaction to say it's valid, otherwise it'll say it's a spoof transaction. Which means that the bigger the database grows, and the more miners there are, the harder it is to crack. So bitcoin is encryption, but the encryption strength grows as there's more miners. And today, it's estimated that it would cost about $31bn to create one fake coin.

Interviewer: wow (apparently sincere)

Interviewee: So it's easier to break into a central bank, like Swift in Nigeria, and steal $50M from there, than it is to try to get one fake bitcoin.

This kind of sadly all too frequent awful word salad obviously helps no one. Not only is it roughly entirely incomprehensible, but it's focused on technology, and technology is the last place you ever want to start to explain anything. You don't explain the internet with a course on http, or the miracle of flight with a deep dive on the intricacies of jet propulsion. Nor should you bring up blockchains, miners, nodes and cryptographic signatures to explain cryptocurrencies either. I will spend virtually no time on tech in this paper, but I will explain as simply as necessary what it does and why it's such a big deal (in part III).

The second and much bigger reason, is that while cryptocurrencies can do all sorts of things, the killer app so to speak, by far, is money. And money is an extraordinary but strange animal you probably haven't spent much time thinking about. You're not alone. This is true of most people, including many specialists in the field you would think should know better. The interviewer above presumably specializes in economic interviews and has demonstrated through these very relevant questions a strong lack of understanding of money. At least the right questions are being asked and that's where we'll start.

In fairness to the interviewee it's all but impossible to explain cryptocurrencies and money in general with a snipet. But hopefully when you're done reading this, this will make perfect sense to you.

Cryptocurrencies are decentralized digital money

That's it. No more, no less. But that's huge enough.

I - Origin of The Species

It’s the money stupid

No you’re not stupid at all, you just haven’t thought about it yet, nor had I until just some years ago, (and I have engineering and business degrees). Of all the sources of confusion regarding cryptocurrencies, and they are numerous, the main culprit is the near universal lack of intuition and understanding of money itself. There’s a good reason for this. Money looks simple on the surface, and in its day to day use it is, but it is an intricate and subtle phenomenon, with economic, psychological, technological and political dimensions. Its origins are a nebulous mystery to most and we typically have some feeling that there’s something pretty strange about them. But we are generally happy to remain mostly ignorant on the topic, because they seems to work just fine, and we have busy lives. We content ourselves with useless trivial analogies such as “it’s kind of like gold”, or ultra simplistic explanations such as “it’s a collective delusion” or “it’s a kind of bubble”, which while on point barely scratch the surface.

This ignorance however has led to a global head scratching collective bewilderment of historic proportions. If we get a single thing from the cryptocurrency phenomenon, even it they fail to materialize to expectations, it should at least be the opportunity to take a step back, open our eyes and finally understand what money is and how it works, something we’ve historically been complacent about.

Money is a bit of a magic trick and it probably looks like magic to you because no one’s shown you each step behind the scenes that leads up to it. And it’s a magic trick everyone is playing on everyone else without even realizing it or understanding how it works. As with any magic trick, to truly understand it, you have to break it down, step by step. And the best way is to start from the ground up.

A world without money

Imagine a world without money. How would you go about your day? Would you ask your employer to pay you in goods and services? Would you barter your way through a grocery store? You naturally understand how inefficient and impractical that is. If only we had something we could exchange for value now or in the future, that we could easily store, divide and transfer. If only we had money. Money’s utility is so obvious and it’s so enmeshed in our daily lives that we take it for granted. But without money, we would be stuck in the dark ages of commerce (any doubts on the matter can be quickly dismissed with a day trip to Venezuela).

Money is the economic lubricant which has allowed the immense diversity of professional specialization leading humanity to the record levels of technological and material wealth we know today. Money is the air of any highly connected economy. Without it, economies that have all the intellectual and material resources they would need to be rich and successful choke to death. This happens regularly around the world as a consequence of reckless governments that have allowed their nation’s legal tender to become unusable.

But where does it come from? How on earth do people trust that a piece of paper with a picture of a dead president on it is worth something to so many today and will be worth (hopefully) that same something to so many tomorrow?

The genesis of money

Intrinsic value

I'm guessing the following basic law of economics is intuitively obvious to you: the unit value of anything is entirely the result of a balance between its total supply and demand. The more people want something and the less of it is available, the more its value goes up, and vice versa. If it's not, just think of an auction house auctioning off a few identical items to a crowd of people. People keep offering to pay more until the price is high enough that there are only enough bidders left for all the items. Unless the auction rules are rigged a specific way, since the items are identical no one will agree to pay more than the other for them. An average price is established for the items. It is lower than the highest bidder was ready to pay but higher than all the lower bidders were ready to pay. Each of the top bidders pay it and get an item. The world's marketplaces work in generally the same way, albeit with a lot more inefficiencies in the process and possible regulations.

Now imagine we live in an isolated village with no money, with an early burgeoning economy where people engage in commerce only through bartering. One of the goods part of this basic economy is gold which is used on occasion for jewelry, and all the gold in the village has been mined, in other words the supply is fixed. Supply and demand balance out and it settles at a certain value. This value is entirely utilitarian. Let's call it intrinsic value, IV.

IV comes in many different forms. If you're oil, it's the average price people are happy to pay to fill up their tank. If you're real estate, it's the value you'll pay to own it to live there or the sum of rental income you can get for it net of expenses. If you're a company it's the present value of the sum of net earnings plus its assets net of its liabilities. If you're a painting you might call it the sum of the value of tickets you can sell to people who actually want to come and see it. If you're a government currency it's the sum of taxes that need to be paid each year. And so on. Anything that has some real world use to some humans will have intrinsic demand for it, or ID, which will lead to it having IV, if its immediate supply is finite.

In our example: gold value or **V = IV**.

Monetary value

Now imagine an apple farmer has just harvested his annual crop and his only current concern is to sell them before they go bad. In other words he owns a lot of real wealth and has no immediate real needs. Along strolls by his market stall a potential apple buyer who he notices is wearing a gold bracelet. There are two main scenarios.

In the first scenario, the farmer who had never thought about it realizes he would actually enjoy having a gold bracelet as a piece of jewelry. At the same time the apple buyer realizes he no longer cares for the bracelet but really wants apples. He agrees to trade. This is called bartering. Two parties exchange things they no longer need for things they do. This has no impact on the value of apples or gold. Neither the supply nor the demand of either has changed.

Now in the second scenario, the farmer doesn't need or care for gold jewelry, but he knows that there is a certain constant demand for it, that it would be easy to store until a later time and that come the time he needed something he could exchange it for the gold bracelet then. Crucially, he didn't set out to buy gold in the form of jewelry but now he is interested in it as a vehicle that can provide a future access to real wealth. Because the apple buyer doesn't really want to part with his bracelet, the farmer is happy to slightly overpay for it to convince the apple buyer give it up. They agree and trade.

Money is born

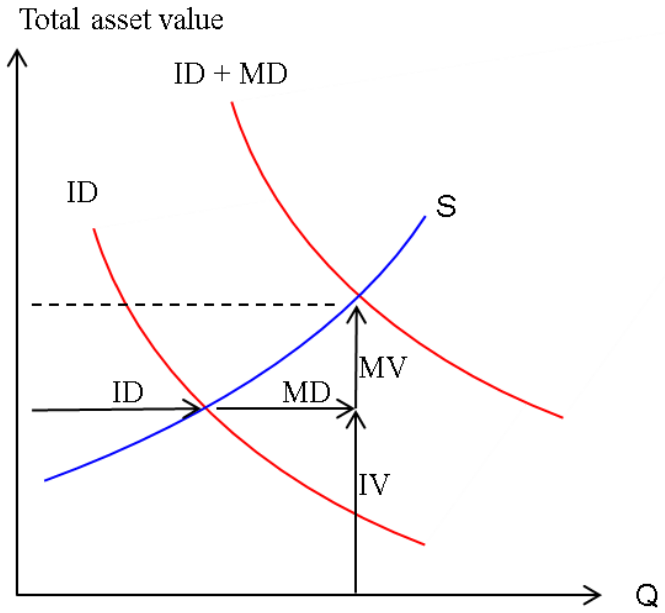
In case you missed it, this is the birth of money, and more specifically of monetary value, or MV. The second the farmer demands and acquires the gold, in exchange for a real good, not for its utilitarian use but for its capacity to be exchangeable for something of value in the future, he has created monetary demand for it, or MD. This is additional demand on top of ID and it is of an entirely different nature. The demand for gold to make jewelry hasn't changed, our apple buyer would still like a golden bracelet and is going to start searching for a place to get one if he can, but there is less gold to go around for intrinsic use now that our apple farmer has hoarded some for monetary purposes. Same supply, more demand. The total value of gold goes up. That excess amount of value is MV. The MV of gold now exceeds zero. And now the total value of gold exceeds its IV. **This is a feature, not a bug**. This is the inevitable consequence of MD. This is the very first step in the magic trick of money.

Now: **V = IV+MV**

In other words, supply / demand curves of anything of value, which we'll generally refer to as assets, should really be represented as supply / intrinsic + monetary demand curves. Any asset, of any nature, can experience monetary adoption. ID drives IV and MD drives MV, but they both tap into the same supply.

Warning: chart below (promise, it'll be the only one)

The true supply and demand curve of an asset experiencing monetary adoption



MV is entirely abstract and the result of a completely arbitrary choice the farmer made to use gold as his monetary vehicle. It lives **IN ADDITION** to IV. In other words (and I can't highlight enough how important this is to understand money):

MV has no IV and IV has no MV. They are two fundamentally dissociated and additive sources of asset valuations that happen to cohabit within a shared asset. Value storage through the accumulation of an asset has no other choice than to live in abstract form. And:

NOTHING. EVER. BACKS. MV.

The fundamental double bet of any monetary saver

Let's observe that our farmer has just made two fundamental bets. The first is that there will be saving needs in the future, ie people who will have things to offer and no immediate needs then, just like he did today. If there are none to be found come the day our farmer needs to buy something and wants to sell his gold to get it, he will only be able to tap into ID, which means by definition the MV he will have spent on gold initially will be worthless. This obviously works both ways, if gold MD has increased by then he will have higher purchasing power.

The second bet he makes is that should that MD have sustained in the future, people will choose gold for their monetary vehicle as well. If they prefer to use sea shells, stones, or pieces of paper with dead presidents on them, our farmer's gold MV will be worthless as well.

And now for the real magic trick: tremendous MV through herd behavior

So far things aren't that impressive, because the farmer was the only one to do this, he only had to slightly overpay for the gold to acquire it for monetary purposes. In other words, gold's value is still essentially IV. And if at a future point in time no one wants to buy gold for monetary purposes, he'll still get IV out of it which will be very close to what he paid for it in the first place (assuming IV hasn't changed, more on that later).

But now our economically visionary farmer explains what he's done to other merchants in the village. They agree it was very smart because they also have lots of things they need to sell now but no immediate needs to satisfy in exchange for them. They decide to start doing the same. And before you know it, half of the gold supply is being hoarded by merchants, intent on exchanging it at a later point in time for something they'll need then. The supply of gold hasn't changed but now the demand has doubled, half from those who want jewelry and the other half from savers. There's no set formula for determining the resulting price, and it's probably not a linear relationship but it's a certainty it's higher so for simplicity's sake let's say it doubled. Half is now held for jewelry purposes by people who want it badly enough that they are happy to not sell it, even though now it is worth double its original price. The other half is held by people who only care that they'll find someone who'll value it at least as much come the time they want to exchange it for something.

Here's crucially what the gold savers likely haven't done. They didn't run a market analysis or a historical chart to figure out that gold's total value had recently disconnected from its IV by a factor two and that it wasn't wise to buy something artificially worth double what its utilitarian use warranted. They might mistakenly think IV has doubled, and they'd be wrong (a classic fallacy we'll come back to later), but they most likely just didn't notice or care. They simply realized that gold was increasingly being used and recognized as something you could eventually exchange for anything, that its value was holding well and even had recently been increasing and they assumed that would remain the case in the future. Doing so they perpetuated an increased demand and corresponding value for it, a value more and more disconnected from its original IV, **a demand of monetary not intrinsic nature**.

In other words, **they did this mostly by observation and faith in a consistent society**.

Herd behavior makes us creatures of social habit

They were comfortable doing this because humans are creatures of social habit. We have an ingrained inclination to believe social behavior propagates and lasts. If everyone seems to be doing it, consistently, then you start to trust that they will continue to do so in the future.

From an evolutionary perspective, you can easily intuit why it makes sense for any social species to have evolved this reflex. You might call it tribalism. If our ancestors saw a tribe member, read someone they had gained a high level of trust about, run away from a predator they couldn't see, their first reaction was to assume he wasn't pulling a prank and to run away as well. This gave the tribe a potentially lifesaving head start in avoiding danger. All herds do this. They start running not because they all see the lion at the same time but because they see a select few of their fellow prey who have seen it run, and their natural assumption is that it's for a good reason and they should get going as well before it's too late, even if it might be a hoax. Better safe than sorry. It makes sense that evolution would have naturally filtered for this trait.

Network effects and the self reinforcing nature of herd behavior

Collective beliefs take form through exponential chain reactions, meaning they progress through a multiplicative not additive phenomenon. If one animal running is enough to convince ten to run, then those ten will convince a hundred who will convince a thousand etc. This is how one animal running can convince the whole herd to follow him in a short period of time. He doesn't have to convince everyone, just enough who will in turn do the same, triggering a belief avalanche.

The crucial first mover advantage

Now imagine two animals in two different places each see a different lion at roughly the same time and start running in opposite directions. They'll each convince an exponentially growing group to join them until there are possibly two collective movements running in opposite directions. Eventually the collective might break off in two, or perhaps enough in the other group get convinced to join the other that eventually everyone is running together in one of the original directions.

But now imagine instead one of them sees his lion first and starts running, triggering an uninterrupted belief avalanche which convinces most of the herd to follow him. If the last animal to make up his mind sees another lion somewhere else, and starts running the other way, it will convince no one by the time it gets going, because the herd has an almost unbreakable conviction that everyone else is correct. That lone animal running in the other direction must be mad, we can't all be wrong they think to themselves. You can't blame them. If you have no other factual inputs to make a decision on, who are you going to believe, one individual or everyone else?

We are inclined to trust beliefs more the more people do and a herd running in a single direction is a highly more compelling observation than a single animal running the other way. Even if the second animal is right and has spotted a much more threatening whole tribe of lions, his efforts will be hopeless because he will be facing an unbreakable snowballing belief avalanche.

This is the tremendous self reinforcing power of networks, they act as ever deepening moats around beliefs. And first movers have a tremendous advantage. If you can convince enough people to follow you it becomes very difficult for alternative views to get traction.

Herd behavior applied to abstract beliefs

And because we are communicative creatures capable of abstract thought, this same reflex also powers myths and abstract beliefs, which went to great lengths to make us the dominant species (a phenomenon Yuval Noah Harari does an excellent job of describing in his book Homo Sapiens, in which he appropriately dedicates an excellent chapter on money).

Because more generally, if a collective can grow consensus behavior, for any reason, they can team up and accomplish much greater things than operating through individualistic actions. On a practical level you get obvious advantages like military conquest or building infrastructure. But once you add speech and abstract thought, you throw the immense power of abstract motivators in the mix, and civilizations are born. This phenomenon originated with supernatural beliefs, which eventually became more respectfully referred to as religion, and for our purposes they're worth looking into a bit.

Religion: the first herd propagated abstract belief

Religions are entirely elective beliefs which beyond satisfying a number of individual spiritual needs are tremendous drivers of social cohesion, providing a communal purpose enabling all sorts of highly productive social efforts. If a collective assembles to build a church, that endeavor's byproduct can be the building of an entirely new town and all the productive assets necessary to its construction. And once complete, the church will help reinforce the underlying religion's belief and adoption, along with its moral values and rules of further social cohesion.

Most religious people have presumably not interacted with God themselves, but if the whole town is going to church, that some people even died to help build, and the preacher is convincing, it becomes a lot easier for them to believe it's true. Because unless you're a natural contrarian (incidentally vital minorities of any society), you're generally inclined to believe that the tribe doesn't lie. We naturally believe that "they can't all be wrong".

This is especially powerful with abstract beliefs because they cannot be scientifically disproved. If the world thinks the earth is flat, you can be called crazy for thinking it's round, but eventually you can fly in a constant direction and get back to where you started and probably convince most people that it's round (but amazingly still not everyone today...those would be the contrarians, in this particular case, not vital). But if you believe in a specific God, no one can prove you wrong. It is entirely a popularity contest for the world's believers. And because of herd behavior, the more believers there are, the more convinced you are likely to be. And the richer the history of believers is, the more that will reinforce your conviction. It's easier to believe in say the catholic faith, and its long history of firm believers, it's huge population of current believers and its bible, the greatest selling book of all time, not to mention its endless landmarks and relics, than it is to trust the year old sect down the road and its quirky guru operating out of his airbnb.

When you are asked what your faith is, people generally expect something they are familiar with, one of the world's leading religious movements. But if you answer with something they've never heard of,

they'll probably ask more about it, in particular, how many followers it has. And if you answer its brand new and there are ten followers, people will instinctively be dismissive. We generally look down on new religions. Even if they are born out of the best of intentions, we tend to derisively label them cults or sects. This is not to say the intuitive understanding of a cult or sect as a grouping of religious nature with moral ideals you disagree with at the hands of a manipulative leader is necessarily invalid, but that we are quick to assimilate this perception with any small newly found religious movement, because it doesn't benefit from the implied validation of a large collective. It is often frowned upon to do the same with established religions, which have a much higher perceived sense of validity on account of their following and history. But their only advantage tends to be of first mover advantage nature. They're just a lot older, which has given them the time to build much greater followings.

This is why it is so hard for new religions to make a place in the world, they're up against highly established competitors, and absent a combination of clever tricks, individual hallucinations (possibly substance induced) and an unbelievably charismatic founder, they generally can't convince an actual divinity to come down to earth and make their case (no more than the major religions did either, although their proponents could be right and I wrong of course, I wasn't personally there), and it's not enough to establish a durable foothold in the endless history of religions.

Herd behavior is also evoked as the wisdom or madness of crowds, depending on your personal opinion regarding the particular self-reinforcing societal belief you're referring to. It's not a panacea and powered by elective beliefs it can lead to society's worse behaviors or its best. From Nazism to the civil rights movements, from wars of corruption and destruction to wars of liberation. But with money, it's immensely powerful, because for money to work, abstract value has to sustain and propagate. And the only way to do that is to convince a lot of people durably. Herd behavior is by far the strongest engine of that effort.

When someone tells you gold is money, because it's been for thousands of years, that conviction is built on nothing more than a knowledge of history and observation, not fundamental market analysis, and your impulse is to agree, because it's an ingrained reflex. This enables both of you to use gold for money. And without money, there cannot be widespread civilization (whether you think widespread civilizations are good or not is a side topic). This is a highly mutually beneficial abstract phenomenon.

If this isn't obvious to you just travel to any new country you've never heard of. You really know nothing of the local money of choice, but if you see everyone around you use it, you have absolutely no qualms about buying some for your purchasing needs. You have huge confidence in its lasting qualities, at least for your short term monetary needs. The mere observation of social adoption is more than enough to gain your trust. Note that this is the same phenomenon driving what are typically referred to as bubbles. We'll address the concept further on.

Money: an economic battery built on a faith reinforced through herd behavior and fueled by saving needs

This is the real magic trick behind money. MV is by construction abstract value, born entirely out of the need to save, read to delay consumption. MV is always elective and the **inevitable** consequence of additional MD on top of ID. And it works through a virtuous circle of self-reinforcing faith through observation by society that something has sustainable abstract value materially beyond its IV. It does not operate by law, but by belief, a belief that whatever value something has today, specifically MV, it will maintain it in the future, perpetuated solely by sustained collective adoption. All beliefs are elective and money is no different. Money works, because it works, when it works, if we choose that it should.

Money is like debt without a debitor, but only faith in society's future MD for that particular asset. Money acts entirely like a virtual scorecard to reallocate real world wealth from former to new monetary savers. And new monetary savers are required for former monetary savers to spend their MV. If overnight MD went to zero, the past efforts of monetary savers would turn out to have been offered for nothing.

Anything can be money to anyone. It is entirely a matter of choice.

Way beyond IV

The network effect applied to money is so powerful that it can drive MD for any asset to dwarf its ID and give it a total value orders of magnitude higher. This is the part one can really struggle with.

You might think monetary savers would prefer assets with mostly IV, because IV provides a valuation floor which if your objective is to store wealth sounds like an enticing proposition. And sometimes that's true. People enjoy monetary saving into things like real estate for example, because "at least it's a house, and a house will always have ID for it". This is true for some. But as it turns out this is a rare case, for one big fundamental reason.

Humanity just doesn't have a choice

The thing is, we are in a world blessed with all-time record wealth, and less blessed with historical levels of wealth inequality (read historical levels of demand for storing future claims on real wealth). Correspondingly, global MD is immense.

Getting precise figures is somewhat of an artistic exercise but here's a rough overview of the global valuation of respective asset classes:

Stocks: $75 trillion
Real estate: $215 trillion
Other (commodities, art, collectibles, …):?
Gold (mined): $8 trillion
Broad money: $90 trillion
Global debt (private and public): $215 trillion

(source: http://money.visualcapitalist.com/worlds-money-markets-one-visualization-2017/)

Our purpose here isn't to get too scientific about these estimates, and there is a material difference between private and public debt forms of money which we'll explore later (parts IV and V) in terms of their respective impact on the potential value of the underlying asset but these different categories experience varying degrees of MD. But let's go through these.

There is close to no MD for stocks. There is some MD and corresponding MV in numbers two and three but probably not a majority. There is probably a lot more MD than ID for gold and it's value is predominantly MV. And the last two derive their value almost entirely from MD and are almost exclusively MV (they can have some residual IV in the form of a capacity to pay taxes).

But MV is not real world wealth. It acts like a virtual scorecard to hopefully gain access to it in the future. Going forward, i'll refer to the total value of real world wealth as GIV or global intrinsic value, and the total monetary value in the world as GMV. As the above shows, GIV is worth something like $300 trillion, and there is something like $300 trillion of potential claims to it in the form of GMV.

Another way to think about it is that the owners of all the money in the world have a potential claim to all the world's real wealth. And the thought that they most probably own a substantial part of real wealth already anyway leads to some interesting snake eating its tail thought experiments outside the purview of this piece. Though it can make sense for them to continue lending out MV in the hopes of getting access to yet to be created additional IV in the future.

But more to our point, this means that there really is no single or select group of real world assets (read that have actual IV) you could use to store wealth without materially disconnecting them from their IV. The fact of the matter is, the world has simply no choice but to use assets mostly comprised of MV for its monetary needs.

As it turns out, this works just fine. $300 trillion of MV is stored relatively safely in a purely abstract form, via instruments we've collectively chosen to represent that value in, confident the collective will continue to do so in the future. But how have we gotten so comfortable storing so much abstract value with such little IV as a safety cushion?

The unexpected preference for money with little IV

As it turns out, beyond the inevitability of it, we are actually probably more comfortable using monetary instruments that have small proportions of IV. There are a couple of reasons for this. The first is that if you're using something with a material IV component, you're exposed to the fluctuations in that IV. One could certainly debate this, but generally speaking, the stablest monetary assets today tend to hold their value more reliably than the stablest real assets hold their IV, at least within their economies. Much better stable MV than unstable IV, even if the first is entirely dependent on the unpredictable whims of society.

The second reason, is that most assets with an intrinsic component tend to be functionally poor forms of money. For a time we used things which had some IV, shells, grains, cattle, gold, and we still do today, but eventually we rightly realized (consciously or not) that since this whole process was entirely fictional, we might as well create our own instead of dealing with the technical limitations of real objects. Recently that enabled us to make this whole process digital, which makes everything a lot easier, from secure durable storage to divisibility and ease of transmission.

And so by far the greatest majority of MV today is stored in fiat currencies, the only fully digital form of money we had adopted until a decade ago. As the first example of entirely artificial money (meaning the underlying unit is man made specifically to act as money), fiat currencies are fascinating animals that deserve their own section. You'll find it further down (in part V), but for now let's just mention a couple things about them. They can have intrinsic value in the form of a capacity to pay taxes. Which means they offer anyone with a tax liability the purchasing power to not go to jail or have assets seized or a combination of the two. Note however that they can work just fine with tax rates at zero in which case they have no IV. In either case, their IV is immensely dwarfed by their MV. Second, government debt of government controlled fiat currencies and cash are virtually the same instruments. In other words, don't think of the USD20 trillion of US debt and counting as anything else than regular dollars in circulation.

The two instruments of willful monetary cognitive dissonance

The arbitrary and elective nature of MV can be deeply unsettling to us, and so we like to rationalize it with false arguments. These are typically of two natures, one is pragmatic, the other abstract.

In the pragmatic approach, we assimilate IV with MV. Again, this is a fundamental error because by construct these are two overlapping things and wrong by definition. **IV and MV are always dissociated**. IV is not MV, MV is not IV.

We'll say dollars are worth what they're worth because they're used to pay taxes. But the amount of tax liabilities in the world is a tiny fraction of total fiat value. I can assure you China is not sitting on trillions of dollars in the form of government bonds because they have tax liabilities to honor or they plan on selling them to someone who does. And the GOP would gladly take tax rates to zero for perpetuity and the dollar would barely notice, at least in the short to medium term (more on this in our section on fiat

currencies). Dollars are worth your perception of the value of something like $21 trillion at the time of writing because they have experienced virtually entirely this much MD.

Similarly people will say gold is money because it has commercial uses. Wrong again, and mostly wrong because gold's value is predominantly monetary. Although there is some blur between gold's MV and its IV which we'll revisit later (part VI), its MV is probably materially superior to its IV, and a lot of gold simply sits in vaults being of exactly no intrinsic use to anyone. If you don't believe me try to squeeze your way into a guided tour of Fort Knox (on the off chance that's a thing).

In the abstract approach, we're more on the right path but still deluding ourselves. We enshrine abstract beliefs in abstract concepts that feel like they have some foundation in reality. This is probably the more honest lie of the two because at least we're sort of admitting to ourselves the value is abstract. We'll say things like "dollars are valuable because they're backed by the full faith and credit of the US government". This technically means nothing but it sure sounds good. It rides on the herd behavior we described. The US government means lots of people. It infers lots of people must believe in it, so it must be true. At least it's honest in that it has the word "faith" in it. Not to stop at the endorsement of uncle Sam, the US dollar is apparently also endorsed by God himself, "in whom we trust", compounding a whole belief network on top of another to make for one hell of a powerful abstract marketing pitch. We also say things like "it's backed by boots on the ground". I can assure you if that's all it took the authoritarian regimes of the world would have high flying currencies. None do. It's quite the opposite in fact.

If you're not convinced of how actually meaningless these arguments are though, here's a thought experiment for you. Let's say overnight the whole world decides the USD is no longer a trustworthy monetary instrument and stops accepting it in exchange for goods and services, and the GOP just accomplished its dream of setting all taxes to zero. If you're now one of the unlucky owners of dollars yourself, your faith in that claim would have you show up at the US Central Bank and demand to buy things with your dollar bills in exchange for tax liabilities (their only intrinsic use). In which case you'd be promptly told that you have none to honor at the moment and that the US Central Bank is not Amazon thank you very much. With that said they would gladly accept your dollars bills and credit your bank account with corresponding 1s and 0s, which no one would care to accept anymore than your original dollars in paper version. I'm guessing you wouldn't have much luck with God either.

The examples are as numerous as the number of assets used as money in the world today. The truth about these false claims, be they pragmatic or abstract is that they are instruments of willful cognitive dissonance, lies we somewhat subconsciously tell ourselves to get comfortable with the phenomenon of abstract value. The lie is not technically necessary for money to work though. You could be honest with yourself and understand the elective source of MV and use it just the same. But if the lie works for you, it surely doesn't hurt. Although it might blind you to the possibility of alternatives, and as we'll consider later, that could turn out to be a costly mistake.

The greatest economic delusion in the world (the beating a dead horse section)

To beat a dead horse, anything in the world will grow MV beyond its IV when acquired simply for the purpose of storing future purchasing power. This is not an occasional fluke, this is the nature of money itself. It is the inevitable outcome of increased MD for it. It is by construct and definition abstract, meaning it relies entirely on future savers making a similar bet in the future. And once adopted for monetary purposes anything can become money to someone. Even something with no IV to begin with. The act of paying something extra for something for monetary purposes is the act of creation of money itself.

The examples are everywhere. If you set out to buy a Picasso, or luxury real estate, or precious metals, or sea shells, or fancy stones, or art, or land, or pieces of paper with dead presidents on them, or things that eventually pay pieces of paper with dead presidents on them, or anything else, not because you have any need or affinity for these items but because you hope they'll still be worth the same or more in the future, you add to the pool of demand for that item and the nature of this added demand is monetary, not utilitarian. That thing, whatever it is, is money, **TO YOU**. Anyone can choose anything for money. It is a choice entirely up to the monetary saver. "It's not money" is a lie. "It will not be money", read "it will not hold its MV" is the only honest claim anyone could try to make. But no one has a crystal ball (although plenty act as they do).

People like to classify things to make sense of the world and they are used to certain asset classes, things like commodities, stocks, bonds and other risk assets, collectables and so forth. And then they know there is this thing called money and there are things we typically use for money, so they call money its own asset class. But they generally fail to understand that money lives on top IV. In other words, MV lives anywhere we choose it to, whatever its original use and value might be. Everything is something and possibly it is money too. It could possibly also be only money.

It is somewhere between entertaining and tragic to see so many "experts" in the field running around with their hair on fire screaming that some asset undergoing monetary adoption is a fraud, as if they were the final arbiters of our entirely elective beliefs. But they do not rule our minds. It's entertaining because it sure makes for some animated panels, but it's tragic in that they of all people should recognize how absurd their claims are.

My best guess for the recurring huge difficulties in recognizing the advent of cryptocurrencies as a monetary phenomenon as legitimate as any other is what Daniel Kahneman dubs *theory induced blindness* in Thinking Fast and Slow. Many people have built classic misconceptions about the nature of money that are now so ingrained in their psyche that it's now excruciatingly hard for them to reconsider them. And as he quotes from Daniel Gilbert, "Disbelieving is hard work".

The right monetary question is never whether something is money. It is to anyone who wishes it to be. The right question is how large its monetary adoption is and will be. For some things like commodities it

tends to be zero, although not always. For things like luxury real estate it's somewhere in between. For things like pricey art and gold it's mostly monetary. For fiat currency it is even more so.

This is not to say that adoption of any given currency can't have its roots in a regulatory effort, meaning in a less than personal choice. But it is never a divinely ordained phenomenon. It is entirely up to humans to decide what they want to use for money. And regulations still come from these same humans. It might say so on dollar bills, and it might help convince some evangelists that their money's best invested in greenbacks, but God never mandated that humanity adopt the USD as a wealth distribution scorecard. It is entirely a social choice.

When someone derides a particular currency as being a lie or a fraud or a ponzi scheme (more on that up next) he is potentially doing one of two things, or a combination of them. He either has no clue what monetary value is and where it comes from, he has simply been using the existing alternatives out of social habit, and does not understand that you can adopt anything different, including a brand new currency (much as the Aztecs could not understand why the Europeans were so obsessed with gold). Or he is a saver in an alternative currency and protecting his investment (more on that later as well).

And now for a couple deathening fallacies.

The deathening fallacy of denigrating currencies as speculative bubbles

Boy do we love to call things bubbles. It's tempting to watch crypto currency values today and scream "bubble!". How can something with no IV possibly go up in value so fast? Everybody knows, bubbles pop. Someone will be left holding the bag. Buyer beware. We love to demonstrate our superior knowledge of the world by proudly warning our fellow citizens to take our advice because we know better what's good for them. The bubble is one of the two major concepts pundits loves to quickly reach for in their discrediting toolbox to criticize anything of value they happens to think is overvalued (the other is the Ponzi or pyramid scheme, which is coming up next). This is not to say bubbles don't exist.

The standard concept of a bubble is a result of the very same herd behavior we previously described as applied to the speculative frenzy that can take place over the price action of a specific asset. People who know nothing about it decide to buy / sell it because they see its value appreciate / depreciate quickly. They don't do this because they've done their homework and have built a fundamental conviction but because they believe that the herd (the market) must know something they don't and the trend will continue. The herd self-reinforces this phenomenon exponentially until it reaches an unjustifiable extreme. Then the bubble "pops" and things revert back to justifiable levels. Nefarious actors exploit this all the time in what are referred to as pump and dump schemes. Note that when people refer to bubbles, they tend to describe things going up too much in value, but it happens both ways. At its very lows in 2009, the stock market was clearly way overshooting on the way down.

This phenomenon is enhanced in both directions for different reasons. On the way down, it is increased by the fact that we all feel more pain from losing than we enjoy pleasure from winning. We are loss averse.

There's probably an obvious evolutionary origin to this. If you lose it all, you're in much bigger trouble than you're better off if your net worth doubles. Our cautious ancestors have tended to survive more even if they didn't get as far in life. You only need so much wealth to survive and propagate your genes, but with none you probably won't. This is the main reason people set stop loss orders, sell orders that are triggered on the way down, to protect themselves against losing it all, no matter what, even if the fundamentals don't justify it.

On the way up, it's enhanced by something called FOMO, fear of missing out. The nature of FOMO is that the perception of wealth is a highly relative thing, meaning that you care a lot more about having more than other people as you care about how much you actually have. It is natural for us to analyze our lot in life by comparison. If you benefit from the middle class standards of a developed society and everybody else in the world is starving and homeless, you will feel unbelievably fortunate. But if instead everyone else in the world lives in McMansions, flies private jets and feasts daily on three star Michelin food, you will feel like the world is the cruelest place in the universe, even though by most technological standards, you are wealthier than the richest kings of old. And if for a second you didn't reflect on modern medical advances, you would probably prefer to be a king a few centuries ago, perhaps even if it you knew it meant certain very unpleasant death in the event of a long ago cured disease, no running water and unconscionably poor dental hygiene, than being an average citizen in our golden technological age today. When FOMO grabs a hold of you, you feel compelled to join on the bandwagon, for fear of missing out on getting richer while everyone else is. In reality, it's not so much fear of missing out, in other words of not having more, as it is fear of being left behind, of eventually having less than others. But FOMO rings a lot better than FOBLB so that's what we call it.

Bubbles and all that drives them are the playgrounds of short to medium term traders. They disconnect asset prices from their IVs and if you can spot these differences, you just might make some money out of it. It's a zero sum game though, the money you make is at someone's expense, so if you win, someone loses and vice versa. They happen all the time. They are an inevitable layer of valuation noise that accompanies the price chart of any asset. And when they get too extreme, they can drive assets up to levels their IV will never be able to justify. For stocks for example, that's the discounted sum of future earnings plus assets net of liabilities. And stocks exhibit extreme bubble phases all the time. Pot stocks just recently. GoPro shortly after its IPO. Most dot coms in 2000. The Dutch East India Company was probably the very first. And as we said they also exhibit it on the way down, but the upwards one is the one we're concerned about here.

The ludicrous fallacy of calling money a bubble

But the crucial fallacy of calling money a bubble is that MV is by definition born out of a valuation in excess of IV through increased demand of a monetary, not intrinsic nature. Something which has a value beyond its IV is in the classic definition of a bubble! But in the case of currencies this is not a flaw, it's the inevitable consequence. It's the definition of money. Money's only way to exist, is to become a self-sustaining bubble of artificially inflated value materially detached from IV born out of MD. And the

more it is adopted, the higher its MV is related to its IV. Money has no other choice than to be a bubble in the classic sense of the word.

When you hear pundits, economists and other so called experts shout that something undergoing monetary adoption is in a bubble because its IV is zero, they are remarkably demonstrating unequivocally to the world their fundamental misunderstanding of monetary demand and value itself.

MONEY IS A BUBBLE

All monetary value is a bubble, by definition. Calling money a bubble is calling it what it is.

There was a fundamental difference between the East India Company bubble and the so called tulip bubble. The company's valuation was in a classic bubble, trading at levels its earnings power could never justify. But declaring that tulips were a bubble is fundamentally misunderstanding the nature of currencies. The tulip phenomenon had nothing to do with a classic bubble, nor had beanie babies. No one ever bought a tulip hoping it would start to pay dividends (at least without planting it). And no one bought a beanie baby hoping it would spawn more rare plush toys. Tulips and beanie babies simply experienced a monetary adoption phase, which was highly speculative (read bubbly if you want) and extremely short lived, because tulips and beanie babies functionally make for terrible money. Tulips and beanie babies were not a bubble, they were simply bad money and their proponents failed in their attempt to turn them into durable money.

The short term explosion of the valuation of any currency is never proof that something nefarious is occurring. Quite the opposite, the quicker it gets adopted the better, as mass adoption is its ultimate goal. A runaway price is the inevitable consequence of a currency experiencing an exponential increase in its monetary demand vs its supply. This is not to say that a runaway price is proof it will succeed either, or a guarantee that it won't have (likely) hiccups on its way to mass adoption. But that it is not proof it will not.

Because a stable value is a desired feature of highly adopted currencies, it is a common mistake to believe that the highly volatile initial stages of a new currency on a fast road to mass adoption is fundamentally flawed. That is however extremely nearsighted. One might even argue that since the main goal of a currency is to at least maintain purchasing power, a deflationary capacity, read a capacity to appreciate relative to others over time, would be an even more valued feature, not the opposite. And if you need to benchmark real world goods to a more stable one for day to day purposes, nothing stops you from doing that on the side, but that's quite a minor use case.

The deathening fallacy of calling currencies Ponzi schemes

Boy do we love calling things Ponzi schemes. It's the second tool pundits quickly reach for to discredit something they don't like. And currencies are not Ponzi schemes, but at a thoughtless glance you might certainly think so. In a Ponzi scheme, a central agent promises investors he can, say, double their stake

each month. After a month he then convinces new investors of the same and delivers the promised returns to the initial investors using the new funds. Soon everyone is flocking to this miracle fund, including some original investors who cannot believe their luck and wish to double down. Eventually more investors demand their gains than can be serviced by drawing in more investors, the scam is exposed and collapses. There were Ponzi schemes before Charles Ponzi, there have been plenty since, Madoff of course, and others. There will be plenty more, because too good to be true is just so damn appealing. If anyone promises you gains, run.

Money is fundamentally different. When I buy something for monetary purposes, no one is promising me more of it in the future. But if it gains in monetary adoption, my purchasing power will magically go up. It smells like a Ponzi because my gains are the result of new entrants now demanding my currency for their own monetary purposes. But there is no foul trick at play here, my gains are real. And they have two origins. The first which we've discussed is increased monetary demand, read savings needs. The second is relative.

Part II - Money Relativity

(continuing my unapologetic exploitations of references to great genius)

Real wealth vs monetary wealth

The real material wealth of the world lies in the things we ultimately need and use: food, clothes, transportation, housing and so on. The sum value of this real wealth is the sum IV of the world. Monetary value arises from the willful act of surrendering real wealth for a savings vehicle. As MD grows, MV grows with it, present in the inflated value of whatever monetary vehicles society has chosen for that purpose.

Now with real wealth, all you care about is just to gain more for yourself (and to have more than others which is a side concern to the point we're making here). Working hard to build yourself a new house will not deprive your neighbor of his own. It will simply increase the IV in the world at your benefit but at no one's detriment. But with monetary wealth, the sum value of all MV corresponds at any given time to the current savings demand. No more no less. And the savers of the world have no say in what that happens to be. They do not control how many people tomorrow would be willing to surrender IV for MV. The only game left to them is entirely to own as big a claim to MV as they can, which means they need to own as much of the monetary instruments this MV is stored in **relative** to other savers.

In effect, moneys are virtual scorecards of real wealth allocation. At any given time MV can be redeemed for IV, assuming you can find a pool of savers within the owners of the IV who want to start saving themselves. And that MV is allocated across all the assets which have been adopted for that purpose. The total MV of the world matters a great deal to the monetary savers of the world but they have no power over it. All that matters to them and that they do control is how much of the MV they can claim. And all that matters for that, isn't so much that they have a lot it, so much as they have more than the other savers.

The Special Relativity of Money

Let's illustrate this with a remarkable example in human history, the invasion of the Americas by the conquistadors. The Aztecs had not chosen to use gold for money and so its total value was restricted to its very small IV in making the occasional piece of jewelry. In Europe however, gold had been adopted as a universal currency. It was the dominant currency of the day. As a natural consequence the value of gold there was exponentially superior following exponentially higher MD, and a resulting huge MV, read, whoever owned all the gold in the world, could claim a large piece of the European IV.

It was so immensely adopted there that a handful of Europeans armed mostly with viruses and immunity to them, happily stormed Latin America and annihilated 20mm natives or up to 95% of the entire population to inflate their claim to a piece of the European wealth pie in what became one of the greatest instance of purely monetary driven wealth transfers of all time. They died (mostly) because Europeans had chosen to use gold for money and unfortunately, there was quite a bit to be found in their home land.

For some back up help, they also were able to rely on that other oh so powerful elective belief, religion, to justify their actions.

What is so remarkable about this event is that virtually overnight the conquistadors massively skewed the European wealth allocation scorecard of the day by finding an immense source of new gold which happened to be the dominant currency at the time. This occurred not only at the ludicrous expense of the lives of most American natives, obviously the greater tragedy, but more importantly (from the shallow economic perspective which concerns us here), of all the gold owners in Europe who's gold value inflated over the fairly short course of something like a century. The amount of real world wealth, the sum IV of the world, didn't budge an inch before or after the American invasion, nor did the sum MV of gold change either. But the unit value of gold went down, and all of a sudden Spaniards and Portuguese had a lot more of it **relative** to the rest of Europe than they had before the American invasion. As a result of this freshly amended artificial scorecard, a lot of real wealth shifted from the rest of Europe towards Spain and Portugal for a century, until they had eventually spent all they had stolen from the natives and had to finally work again for a living.

It's a hugely telling testament to the power and artificial nature of money that the rest of Europe had so much blind faith in the sustained adoption of gold as money that they had no issues working for the Spaniards and Portuguese for a century to reward them for the simple absurd reason that they had stumbled on a new pile of it. It's as if overnight the ECB had dropped a trillion freshly minted euros in the Spanish and Portuguese coffers no questions asked and the rest of Europe had gone about as if it was a perfectly normal state of affairs. It was labor and wealth thievery, but it did not break any rules. There are no rules of the universe guiding faith, they are simply abstract social choices.

Intrinsic vs monetary inflation

This highlights an important distinction. Inflation comes in two crucially different forms, but we tend not to differentiate them. We should, they are very different animals. Let's call these intrinsic and monetary inflation.

Intrinsic inflation is the one that matters to the world as a whole. At any given point in the time, the world's real wealth, be it commodities, real estate, productive assets, and countless others is a fixed quantity. It is up to humanity to decide how to allocate this wealth amongst itself. Intrinsic inflation goes down when the real wealth of the world increases relative to its population and vice versa. Wars where all the economic infrastructure is obliterated in a short period of time generate good examples of extreme intrinsic inflation.

Monetary inflation is the one that matters between monetary savers. Money acting entirely like a virtual scorecard to reallocate real world wealth, the only game in town for monetary savers is to have more of a more adopted currency than the other monetary savers. Whether the world's MV will hold is out of their hands.

Whether people realize it or not (and they generally don't), the concerns of inflation you generally hear about these days are monetary. We're worried too many new dollars are getting printed one way or the other. This is monetary inflation. It has nothing to do with intrinsic inflation. For all the tragic rise of wealth inequality we are witnessing today, I can assure you the wealth of the world relative to its population has never been greater. This stems mostly from continuous exponential technological progress. The fact there have never been more dollars in circulation than today is of concern only to monetary savers.

The actual and genuine inflation fears you might hear of today concern the potential loss of savings power of fiat savers in the zero sum relative game of real wealth reallocation via the dynamic scorecard of monetary savings in the event of further printing of additional units of their monetary asset at their expense.

Let's take take a broader look now.

The general relativity of money: the ultimate popularity contest

In a world with a single currency, you are constantly fighting to have more of that particular currency than other monetary savers, as was basically the case with Gold during the discovery of the new world. But as we've discussed extensively, money can live anywhere. There is correspondingly a constant fight for recognition between the monetary assets of the world.

In effect, the world's currencies in all their forms are in a constant fight to gain recognition and claim a piece of this monetary pie. Just like with religion, it is entirely a popularity contest. Each shouts to the world via their adopters, be they individuals or supporting governmental institutions that they will be more reliable at being redeemable for value in the future than all the others.

If overnight gold proponents convinced the masses that gold should become the sole adopted global currency, gold's total market value would go to the equivalent of the total MV across all currencies today and the purchasing power of non gold monetary savers would in turn go to zero. This is an entirely relative, zero sum game. The result of this game is a constant reshuffling of the allocation of real world goods and services owed to former monetary savers by new members wishing to become monetary savers themselves. As the level of adoption of each currency evolves respective to all others, so does the global scorecard of real wealth allocation via monetary instruments.

If the world's dollar holders in the form of treasury bonds or cash got worried about the USD overnight and went out to spend it all, the dollar would experience extreme monetary inflation. As we've discussed, this would not be real world inflation (all else equal). Neither the amount of global goods and services nor their demand would have changed one bit. Nor would the demand for monetary saving have budged. But USD savers purchasing power would collapse in favor of the purchasing power of savers in alternative monetary assets. And as we've gone over before, you could not send your dollars back to the US

government in exchange for real goods and services for taxes they were not asking of you in the first place.

Again, the shuffling of IV allocation to MV owners is an entirely zero sum game. To paraphrase Lavoisier:

Nothing is created, nothing is lost, all is transferred

If I buy a painting by an obscure artist whom I believe shows promise and a year from now it turns out I was right and I can sell it for $10 million, the purchasing power of all other currency holders has gone down by that much because my personal purchasing power has increased by that much. They will not notice it, because the monetary mass is so huge that single events like this have minute effect on all other purchasing powers, but the effect is real. Some fortunate saver, somewhere, who was about to put a bid on his new fancy London pied-a-terre just got outbid ever so slightly by someone else. That someone else is the former happy owner of the painting who will now enjoy that bit of real estate and not our wealthy investor who thought he was about to. And it is not because there is additional real world wealth in the form of a new $10 million worth piece of art. It is because that piece of art has been adopted by the masses as a new form of money to the tune of $10 million worth and the collective purchasing power of all the other moneys of the world has gone down by as much. The person who just paid $10 million is not getting that amount of artistic enjoyment out of it, he is stashing wealth. More on that later.

We're not far from bringing up cryptocurrencies, but i'll bring up here that people talk derisively of "hodlers" when describing the group of investors promoting their crypto currency of choice and yelling to the top of their lungs that it is the future currency of choice. This is not a fraud. This is the natural reflex of any monetary saver. This is the same impulse leading gold bugs to scream that gold is the only true form of money, that only dollars are legitimate because they are "backed by the full faith and credit of the United States", or by the happy few owners of Monets with limited artistic inclinations who proclaim him nonetheless to be the greatest artist of all time. A currency's sole purpose is for people to desire it in the future. It is entirely a subjective popularity contest. Promoting it is normal. It's more than normal, it's to be expected, it is essential. To the "hodler" of any money, his future purchasing power depends on spreading the gospel. And it's all fair game. GMV has to live somewhere arbitrary, you'd be insane not to fight for your pick.

Note that for our apple farmer, things turned out great. Because he was the fortunate early acceptor of a new currency which then gained wide adoption, his purchasing power from the gold he acquired doubled. This occurred either because he was in the early stages of a savings boom, or because he chose gold as his monetary vehicle which ultimately gained favor vs other forms of money and so gained at the expense of savers in rival currencies. You might call what the apple farmer did speculation or gambling if you want to put a negative spin on it or you might call it investing if you think it's more laudable. That's true of anyone accumulating any risk asset (meaning one he acquires in the hope it will return as much or more value in the future). The general spin tends to be that if you're not thinking about what you're doing you're gambling (read taking an uncalculated risk), but if you are you're investing (read taking a

calculated risk). You're smart. People love to claim they know in which bucket you are, it's often a condescending poorly educated guess as well. Moving on.

Cash is never risk free

Agreeing to sell something for money is an investment in that particular monetary vehicle, and investments are never risk free, even monetary ones. When you pick one, you are placing a bet on that particular currency's future, and specifically on how much it will have been adopted as money at the point you're ready to spend it in exchange for real goods or services. Come that time, you will be in competition with all the savers in other currencies looking to do the same. And if their currency has gotten more popular than yours, it will be more in demand relative to yours and your purchasing power will be lower, because everyone is fighting for a piece of an MV pie they don't control. Choosing right is a vital concern.

So what makes for good money?

So since we can technically use anything for money and its entirely a relative popularity contest, what should you put your money on? That's a bad pun, but today as we've seen, that is literally a $300 trillion question. GMV is currently in the hands of mainly wealthy individuals, large institutions, asset managers and central banks. It's predominantly stored in the leading fiat currencies in direct form or debt form, a little bit in precious metals, a material but difficult to quantify amount in real estate, and then in esoteric things like art, which we'll touch on later. And while these MV stakeholders can be somewhat complacent about their allocations in the short term, there is nothing to technically stop them from switching into different assets at any given point in time should they find preferable alternatives.

You can easily intuit the attributes that make for good money. Because their value stems entirely from supply and demand, scarcity is crucial, all else equal. And supply is the only input in the equation you can really build strong confidence about. The rest is up to the Gods of money, or more to the point to their followers. It's also better if they're fungible, easy to store, divide and transfer. If all the stars line up, possibly with some added regulatory help, you can become a dominant currency adopted by many and develop MV that dwarves the total valuation of any real world asset in existence.

As we've highlighted, we've long recognized that man made and digital was better than all the real world alternatives and it shows in our monetary markets which overwhelmingly are invested in fiat currencies in the form of cash and treasury bonds. Digital is better by all practical accounts and since you're creating your unit of value, you can now control its supply. This is a huge deal, because supply is literally half of the final valuation equation. Scarcity is a monster driver of value. And the perception of sustainable scarcity is perhaps the most important attribute of a monetary asset.

Now government issued money called fiat currencies work somewhat well in the hands of fairly responsible governments like the US (some would even disagree but generally speaking let's assume

that's the case). In the hands of the Venezuelan government or the Weimar republic though, they're a disaster. And while their government can mandate their use, locally, they can't mandate their demand, locally or globally. If the press is operating at light speed their sum value will erode to zero from the lost faith in their value holding power. And if you're a heavy importer, your global purchasing power is vital. Again, MV comes from belief, not law. If you can't convince end users, adoption will not take hold, and you'll be stuck in IV land, which for digital currencies (read man-made) tends to be exactly zero, unless you tax them. But that won't help you with your imports, and even more importantly, taxed fiat cannot hold MV (more on that in the fiat section).

But in the long run, even fiat currencies in the hands of responsible governments inevitably lose their value as they get relentlessly printed, even at reasonable rates, to reward government providers of goods and services. This is in effect an inflationary tax on savers in the said currency. This is the artificial equivalent of the gold inflationary tax the Europeans suffered at the hands of the conquistadors who were fortunate to unearth a huge additional pile of it. And the reason this tends to happen is it's politically a lot easier to do this than to tax money in existence and redistribute it, as taxes in general and wealth taxes in particular are especially unpopular. Printing is a lot easier. Fiat savers don't notice nearly as much that their purchasing power is reducing as they notice you trying to take some of their money directly. This has unsurprisingly tended to be the preferred course of action of virtually all fiat governments.

There's nothing wrong with doing things this way. Done reasonably, it works just fine. Your total fiat money can grow endlessly, as long as it's done at a reasonable rate. Every year the scorecard shifts a bit, there are a bit more dollars in circulation. Depending on how they were spent the total economic pie hopefully grows beyond the amount spent. The relative purchasing power of a dollar has assuredly gone down, but its absolute purchasing power might have even increased if the pie has grown sufficiently (productive spending), or it might have gone down (inefficient spending). And it has the added kicker of inexorably reducing the purchasing power of foreign holders of your currency (eg China). If hopefully they don't notice too much, they'll keep giving you real world goods and services for fancy bits of paper with pictures of dead presidents on them and divine assurances of future recognition. Unless perhaps you start to pick trade fights with them or start recklessly spending new dollars to lower corporate tax cuts, basically a monetary subsidy to stock investors at the inflationary expense of dollar savers (some would of course disagree), in which case they might reconsider.

But if you're a savvy monetary saver, you quickly understand that government fiat, for all its qualities of convenience, is a terrible long term store of value because its relative purchasing power erodes indefinitely in the face of relentless issuance of new units at your expense. More on fiat in its chapter lower down. But it's not necessary to understand fiat to understand money, and cryptocurrencies themselves which we can now bring up.

Part III - Cryptocurrencies, the real nature of the revolution

There are a couple main claims that are typically made to explain the advent of cryptocurrencies. They are both wrong.

The first is that they enable illegal activities. This is extremely narrow sighted and mostly wrong. There is a simple reason for this. I don't think it's being naively idealistic to believe that the majority of humanity does not have criminal inclinations. As proof, consider that there are cryptocurrencies specializing in providing increased privacy (read better for criminal activities), namely Zcash, Monero, Dash and to this day they represent only a small fraction of cryptocurrency valuations. Dollar bills are the single greatest vector of criminal activity in the world and that also represents only a fraction of dollar usage which remains the leading global currency today.

If a technology is good, it is obvious that criminals will find a use case for it. It's a sad but obvious state of affairs that they're generally not stupid enough to use inferior technology if better is available. They also use cars, electricity, the internet and eat bread. We're still arguably better off with them. They're understandably not going to try and rob a bank with a getaway horse buggy. And while there are some criminal applications which are specifically enabled by cryptocurrencies, mainly ransomware, they are not only entirely preventable through information back up procedures, but also represent a minute fraction of cyber crime today.

People love to bring up criminal applications to dismiss new technologies they fear, so it remains a popular argument. It's near sighted at best. The simple fact of the matter is the bulk of GMV is generally by perfectly legitimate individuals and entities, and if they think cryptocurrencies are better up to the unbelievably valuable task of acting as their monetary asset, there is no reason to think they wouldn't switch. And they probably wouldn't mind making those holdings public if regulations required it. Their universal goal of maintaining that fair value exceeds their occasional goal of hiding it from others by orders of magnitudes.

The second leading misconception is that somehow the main appeal is this cool new set of technologies, summarized as "blockchain", make for a better database. The reality is that while extremely elaborate and elegant, blockchain technology make for very inefficient databases. Although they will probably be a lot more efficient than people might fear soon enough, decentralized systems (which they are) are slower, more complex, less accurate, less reliable and terribly difficult to maintain.

At the end of the day, all money is a virtual scorecard, read, in digital form, a simple database. And it is immensely easier for a central agent to control a single database on a single computer than it is to maintain the issuance and transfer of a decentralized cryptocurrency. All this talk of using blockchain technology in the private sector is at best a bad confession of boring and generally immaterial failings of other alternatives like SQL and at worst misguided claims by uninteresting executives to sound like they are on the cusp of technology while dismissing the core point of the entire revolution as a passing fad.

The real crypto revolution

No, here's why cryptocurrencies are so revolutionary. They allow the creation of a digital unit of value with issuance and transfer mechanisms that are decentralized, read immutable to the whims of central agents. This means that to deviate from the original rules of the game, either to temper with the number of units in circulation vs what was previously agreed, or to block transactions, you need massive supermajority consensus from a huge majority of stakeholders. It's somewhat as if anytime the US central bank wanted to issue more dollars to give to someone at your expense as a dollar saver, or anytime the feds wanted to seize a bank account, they needed to conduct an international referendum with all of the dollar stakeholders and get over 90% of yesses. It's not impossible, but its quasi impossible, especially the former, considering it is never in the interest of the stakeholders to inflate their money supply. And if for some reason it is, then it means if you're a stakeholder you're probably ok with it too.

Parental warning, i'm now about to use the only curse word in this entire paper, sensitive eyes move on.

Simply put, this means no single individual or institution can directly fuck with the crucially important money supply, nor to a lesser degree with its distribution, storage and transmission.

This is a groundbreaking breakthrough technology. It has its origins in solving the "double spend" problem. The actual technicals are vast and complex and I invite anyone interested to educate themselves on the matter. I'm not particularly myself but if you're a technophile i'm sure it's fascinating. I'd repeat however that it's generally not necessary to understand how a technology works to adopt it, you just need to understand what it does and trust that it does when enough people tell you so or when you've observed it enough yourself. It's no more necessary to be a cryptocurrency expert to use it than it is to understand http to send an email, or that it is to know how an ATM operates to trust it'll keep spitting out dollar bills.

This revolution is technological and summarized commonly by the word "blockchain". This is a poor choice, because a blockchain is simply a database of all past recorded transactions of a cryptocurrency. Databases are not revolutionary, here's what's revolutionary. The solution to an entirely man made numerical currency that cannot be controlled by a central agent is to have one that is controlled by as many as possible through a democratic consensus effort. This technology made this possible.

A fully decentralized cryptocurrency is a currency supported by a computing network open to as many people as care to join, with the sole purpose of verifying that the issuance of the currency and its transfer mechanisms follow preset rules. This is achieved at all times by consensus of this network. The more participants join this network, the harder it becomes for any one malevolent actor to manipulate the rules. You don't want one central banker, you want thousands, tens of thousands, hundreds of thousands… The more are involved the more you know the chance is small that something nefarious can occur.

We now have digital money that has all the benefits of numerical transfer and storage but who's supply cannot be corrupted by a central bank and who's storage and transmission cannot be censured by a government. These are enormous advantages. In the long history of new monetary candidates, these

provide compelling functional differentiating propositions, functional advantages that just might be strong enough to break through the extraordinary network and regulatory advantages that the leading fiats of today enjoy, and establish a material foothold in the global competition for MV. And if this were to occur, this will happen at the expense of today's monetary kings.

The perfect illustration of monetary valuation in the advent of cryptocurrencies

The advent of cryptocurrency is the perfect and purest demonstration of everything we've gone over, demonstrating in a very short amount of time all MV is, its origin, and propagation. Bitcoin was first issued in 2009 and for a time was not transacted for value. It had no IV and no MV. It was just worthless numbers on a database. People have the false perception that you need IV to act as a seed to MV, but you was proof you don't.

At some point, somewhere, two people exchanged something of value for bitcoin. It occured in a very informal manner. A few million bitcoin had probably been issued by then and some were starting to get exchanged for things of very little IV, either as a joke, an experiment, or just for the fun of it. The most famous very early example is 2 pizzas for 10,000 bitcoin back in 2010 (the corresponding reddit threat is still up, it's quite the remarkable bit of monetary history). Bitcoin was already trading at the time so it was not the first but it's the first people recall.

Here's the remarkable thing about this origin story. For possibly the first time in history, an asset with no IV experienced MD, demonstrating in one clear cut example that IV has nothing to do with MV and while IV can create an initial valuation that monetary demand can build on top of, **it is not required to do so, and irrelevant in the long run**.

Once people saw this occur they started doing two things. First they considered the functional qualities of bitcoin and saw it could be a preferably monetary asset, because it was digital and virtually incorruptible. Second they saw it was starting to build MV and through herd behavior started propagating its adoption, just like the merchants and gold in our introductory example.

This MV arose from two main sources. The first was people choosing that asset as their monetary vehicle instead of alternatives and offering up real goods and services for bitcoin. This is the absolute source of MV in the world. In other words, they worked for bitcoin.

The second came from speculators, who observed that this new monetary asset had great potential and made a corresponding bet, selling their own monetary assets for bitcoin. In its early days, this has been by far the greatest source of bitcoin's MV. This portion of its valuation is a zero sum game outcome which has occured at the expense of rival monetary assets, namely fiat currencies, in the endless historical game of relative fight over MV. Fiat savers haven't noticed yet, but their purchasing power has eroded to date to the tune of roughly a few hundred billion dollars and counting at the time of writing at the expense of so called bitcoin millionaires, some of which are now living on a beach. The fiat savers are experiencing

monetary inflation and the crypto savers monetary deflation. All else equal, intrinsic inflation has not budged, society just shifted who gets what. A little bit. For now.

This is how you go from something worth exactly 0, to it having captured hundreds of billions of dollars of MV today. And now you understand every step in that process. And. It's. All. Fair. Game.

The three main challenges cryptocurrencies face on their road to mass adoption

Make no mistake about it. Cryptocurrencies are steamrolling new entrants in the never ending competition for GMV. And it's no hyperbole to suggest that the consequences of them being materially adopted would be of world shattering proportions. For starters it would be the greatest case of monetary wealth transfers of all time, by many orders of magnitudes. But on their path to eventual success they have three main hurdles to cross.

The first is regulatory. As we will see later in our fiat chapter, governments currently hold immense power in their control of the leading monetary assets of the day. They will not casually surrender it. But the fascinating bit in this part of the puzzle is that because cryptocurrencies live on the internet, they are a global phenomenon accessible to all with an internet connection that is not entirely compromised. And the resulting regulatory landscape will be an extremely rich and dichotomous result of a whole global spectrum of varying national positions. Already we are seeing some friendly nations and some hostile ones, sometimes simply the result of rival nations taking opposite stances by default, some cautious vs some embracing what they see as progress or even a way to differentiate themselves and gain a foothold in what they perceive as the potential future of the global economy. This will be a long shifting and uncertain process. And the best guess is they will be legal in enough countries that they have plenty of room to materially grow before encountering their average global regulatory cap.

The second is that to break through as material new entrants on the monetary stage, they will have to offer functionalities which are compellingly preferable to that of existing fiats of the day. As we've discussed these are very high resistance to supply, storage and transmission manipulations. The network effect the leading fiats of the day hold today is immense. Most people still scoff at the notion of changing out of their hard earned dollars into cryptocurrencies (if they didn't their respective MVs would have flipped by now). This is not unreasonable. The infrastructure and recognition built into fiat currencies is orders of magnitudes greater today than for cryptocurrencies. Things can change quite fast in the land of perception though.

The third concerns our first mover advantage. It's immensely more difficult to spin off your own nation, create its own fiat and offer it up to the world as a monetary candidate than it is to copy paste a cryptocurrency protocol and do the same. Correspondingly while we still only know a couple hundred national fiats today and can expect not many more to arise in the future, there are already some 1500 cryptocurrencies in existence and counting. This is of little wonder. Individuals have discovered how to make the fire of finance themselves and you can bet they're not going to wait around for their elders' permission to start their own little fires. Especially when the oversight is currently limited and the stakes

are so ludicrously high. Expect hundreds of thousands of rival cryptocurrencies to spring up before this game plays out. In fact it would not be entirely surprising for us to evolve into a world with a constantly shifting landscape of new cryptocurrencies springing up everyday, and vying for their own little spot in the joyous mound of monetary asset candidates.

So the $300 trillion question of whether a select few will gain a majority piece of this pie is screamingly relevant. The way this will happen is if the network effect we explained earlier on is strong enough to perpetuate the adoption of cryptocurrency victors. This is anyone's guess. But this network effect is not trivial by any means. You might hear some critics say cryptocurrencies cannot be scarce because you can clone them. This reasoning is not entirely without fault, but it's very narrow sighted.

Each new cryptocurrency is its own network, and while you can trivially clone the code that backs it up, you can't clone the network itself. You can't clone the hashpower dedicated to mining that particular cryptocurrency and securing its resilience, you can't clone the network of nodes that assist in the same effort, you can't clone the community of developers which chose to work on the original one and not the new one you've created, you can't overnight force wallet providers, cryptocurrency exchanges, and various other websites to amend their infrastructure to support your particular coin version.

And most of all (by far), you can't clone the user base which has placed their faith in the prior version of your new coin. You can't clone the monetary demand. You'll have to convince people to switch over. You are that animal late to the party shouting to a herd already running in a different direction, and that momentum is not impossible, but extremely difficult to break, unless you have very compelling reasons. eg : this lion over here is much more dangerous, run with me instead. In the world of money, specifically of cryptocurrency, those arguments need to be functional. Your currency has to be compellingly better, from a functional perspective. If you are just the same version of a prior coin which has already gotten a material headstart, good luck to you.

There's another example of this in a different type of asset that has experienced heavy monetary adoption: art. Just very recently, a painting was authenticated, not without controversy, to be a Leonardo Da Vinci. This made this work, Salvator Mundi, go overnight from being worth nothing, to getting purchased for $450mm at auction. The exact same painting which virtually no one cared for before hand, was now the proud recipient of nearly half a billion dollars worth of monetary value. All because it had received the branded stamp of the Leonardo signature. And no one would care for a clone. I could reproduce that painting to the very last atom and it would have trivially small IV to anyone and exactly 0 MV. But once it's authenticated as being a Leonardo, things change. Cloning money is not trivial by any stretch of the imagination. Art is a very quirky but interesting recipient of MV, i'll touch again on it later.

My personal best guess on the final outcome of this fascinating monetary turn of events we find ourselves in today is that of a world with dominant cryptocurrencies living side by side with major fiat currencies, a vital tool not to be discarded out of hand (more on the matter in the fiat section). But it's anyone's guess. If you are a monetary saver though, that is a question you can no longer casually dismiss. If you get this wrong your claim to GMV might vanish at the benefit of others.

Functional differentiators

The general premise of this paper is to focus on the monetary application of cryptocurrencies. Again, from a valuation perspective this is by far the greatest prize for cryptocurrencies. But they can do more. Since the technology inherently enables the decentralization of wealth transfer, you can imagine replacing all sorts of intermediary services. To take a simple one, you could create a cryptocurrency designed to wager on sports outcomes, which would pull outcomes from various reliable databases and deliver payouts accordingly from the pool of wagers in that cryptocurrency it would have received, **programmatically.** This would eliminate entirely the added charges of the William Hills of the world. With just a little imagination you can conjure up quite a few examples of entire industries on the cusp of disruption. This is referred to as smart contracts. The early cryptocurrency specializing in this application is called Ethereum, and today it has built a solid first mover advantage in that field, making it the second most value cryptocurrency in the world.

In a similar vein, you can create utility tokens. These are cryptocurrencies built on protocols that enable you to benefit from a service by acquiring and paying for that service in these coins. One of the first such examples is to enable using other people's hard drives for storage. You pay them in this coin and rent their hard drives to store your files cryptographically.

The jury's out as to whether smart contracts or utility tokens will live up to their functional aspirations. But these differentiators do give them potential IV, aside from having the potential to store MV which till now is the sole application of bitcoin. That said, Bitcoin's latest protocol enhancements give it a potential future run at similar characteristics. How it all plays out is an important matter to the cryptocurrency investor, but outside the purview of this piece.

Why all the hate?

You might have noticed, there is no small bit of animosity directed at cryptocurrencies. There are a number of reasons for this.

First, we are creatures of habit, which means a lot of us are resistant to change. That makes some sense. Changing worlds are stressful, they require effort to adapt, something that we don't always personally find justifiable versus whatever the supposed upside of what we're being asked to transit to, or even preferable. We might prefer the old technology. We have busy lives and available money we're familiar with that works pretty well (if we're fortunate) and now we have to think about some new kind of money we might have to diversify into? We have enough problems as it is. But unfortunately there is no law of the universe that says preserving monetary wealth should be a trivial thing. And it's not. Perhaps one day the world will have adopted a single monetary asset and things will be simpler. That's not the case today.

Second, there's an intuitive sense of a moral social contract that if someone surrendered some amount of IV for MV he should get that same amounts worth in the future. It's fair to be rewarded justly for one's efforts. In our case, if cryptocurrencies get adopted en masse, it will be at the humongous expense of savers who placed their faith in the wrong monetary assets. It's hard to disagree with this from a moral perspective, but it's a utopian view at best to wish for such a world. This is its own lengthy discourse and I won't elaborate.

More generally, gains acquired through favorable bets in relative MV tend to be frowned upon. While CEOs can make a pretty penny, by far the largest path towards extreme wealth has been to be an early investor in a venture with a successful outcome. We tend as a society to be more forgiving of the resulting wealth inequality when the nature of that wealth is intrinsic, meaning you have increased the real wealth of the world. It is not entirely unreasonable that if instead you got wealthy as a simple relative consequence of having invested in a form of money which got more adopted, you are less worthy of enjoying the fruits of society. You were just lucky.

But this brings up just a much wider debate of whether wealth inequality is generally so justified in the first place. Plenty of so called early investors did not contribute much towards their extreme wealth. They happened to luck in on a first round financing of such and such company and sat in wonder as their wealth grew. The people that actually built the company typically only get fractions of the corresponding wealth for their efforts. This is another very lengthy discourse I won't elaborate on.

More importantly, we act as if money is a trivial technology. It is not. Money is a vital instrument which lubricates and fuels the world economy. It is every bit as important as any cog in the economy itself, if not more. And if a new technology enabled the creation of a preferable alternative, its early adopters who are taking every bit as much a risk as early investors in any risky technology have every right to be rewarded similarly for their efforts (if you agree early tech investors should be rewarded with a disproportionate stake in the resulting benefits). If their thesis doesn't pan out it they will lose accordingly as they watch their new currency of choice end up having no purchasing power.

Note that we frown a lot more on these so called crypto millionaires for becoming so easily so rich so fast than on the likes of George Soros who made a billion or two betting against the pound. For some reason it's cool, noble and clever if you're making a small fortune by sticking it to a central bank but tasteless and crude if you're investing in a new but highly risky monetary asset. It's literally all FX investing though, and a game of relative wealth accumulation. Soros got rich at the expense of other fiat savers, not at the expense of the UK central bank. For some reason there's a patina of respectability with fiat that is typically labelled as more legitimate money that makes it more ok. I can't see the justification for it though. In the same fashion, people who bought NY real estate got rich at the expense of people who bought Detroit real estate. And people who bought Monets got rich at the expense of people who bought dollars. It's all the same game. And if someone bought tin cans thinking they'd be the next dominant money of the world and they did, they would have no less reason to be rewarded than all those other examples. People don't though because tin cans don't seem like a good long term monetary bet. Cryptocurrencies just might be though.

Third, within the current monetary system lies an enormous entrenchment of rent seekers (banks, credit card companies, etc.) and monetary savers whose future earnings and purchasing powers depend on rivals not gaining adoption at their expense. It is probably not a coincidence that the cfos and ceos of major financial institutions, various central bankers and a general majority of old rich people sitting on treasure troves of fiat currency have been shouting across the rooftops what a fraud cryptocurrencies are. Their genuine opinion is almost irrelevant, but it makes perfect sense they would fight the phenomenon. The sustainability of their wealth depends on it.

And now for some annoyingly recurring misconceptions.

Some misconceptions: the private blockchain and the whole nonsense about government issued cryptocurrencies

Blockchain technology is an expensive but indispensable approach to truly decentralized money. The idea of a private cryptocurrency which you might have heard of demonstrates fundamental ignorance of the concept. Private digital money exists mostly in government form. And it's public money sure, but it's private in the sense that it's controlled by roughly a single individual, even if that individual is elected. It requires a single agent and database. It's fairly easy and cheap (although the technical pipes on which run the fiats of the run today are fairly deplorably complex, but that's a bit of a trivial matter).

A decentralized currency lies at its opposite spectrum. It requires as many agents as you can get, and it gets more expensive and more robust the more you get. Naturally you can run experiments running in between these two ends of the spectrum. You have what are actually very private cryptocurrencies posing as decentralized ones (including one of the top ones by recognition, but it helps to call it a cryptocurrency to sell it, it smells like you're getting your cake and eating it too). The community of another cryptocurrency floated the hotly debated idea of a council of elders to make occasional rulings on nefarious transactions, a sort of currency board with superpowers which smells an awful lot as well like a central bank.

There's no law of the universe that says there isn't a preferred middle ground between full decentralization and none of it, but buyer beware, educate yourself and know what you're buying. The true revolution is moving the decision making from a central agent to a consensus effort by as many stakeholders as possible. Anything in between is a compromise.

And a government issued cryptocurrency is just a fancy way of saying let's convert our fiat pipes to blockchain pipes. Sure it might be slightly more efficient technically because fiat pipes are so messy in their current state, but if what goes on there has to be endorsed by the state, that's not a decentralized network and that nullifies entirely the whole point of a cryptocurrency, which is for your supply and transmission not to be at the mercy of a central entity. Just be honest about it and call it fiat currency. Government officials seem want to ride a wave of technological hype and generate the perception they "get it" by proposing they'll switch their fiat to the blockchain. It's ignorant at best. If they do, it'll still be

fiat, just *on the blockchain,* as Matt Levine recurrently likes to maliciously quips (he's generally very much on point when he does).

Some misconceptions: the decentralized blockchain without a valuable underlying currency

There has been quite a fad to claim that "blockchain is interesting but without bitcoin which seems to be a fraud". This couldn't be further from the truth, because as we've explained, private blockchains, while they might provide some cleaner ways to run certain private databases, maybe, are still just a better version of excel, which is nothing to scream revolution about. Decentralized cryptocurrencies build their security and decentralization through the appreciation of their underlying currency.

Participants in the securing network, called miners, get rewarded in the underlying currency, either through new issuance guided by the rule book (the protocol), or by transaction fees paid by the users of the network to transfer money between themselves.

This generally means that demand for the currency itself means higher rewards for the miners which increases the incentives to join and hence the security of the network. A valuable cryptocurrency is a necessary condition of its decentralization and security, which in turn drives its appeal and general success in what is hopefully a virtuous increasing adoption loop.

When it comes to the monetary use case, blockchain without a valuable underlying currency is the real fraud. Most of the reasons why people keep making this argument are to be found in the early *why all the hate* section.

Some misconceptions: a bitcoin is worth the marginal cost of mining

It's literally the other way around (although yes writing it in reverse would technically be the same thing, but not in implied meaning). The price of a cryptocurrency is driven entirely and solely by market appetite which along with demand to use the network vs its capacity and potential new issuance rewards to miners set in the protocol then drives the break even cost for mining, and the mining network adapts at all times to this cost. This involves an endless evolution in the mining arms race of small and big players gaining access to various amounts of hardware and turning them on / off as their access to electricity and break even costs get under / over the live price of whatever currency they're mining. This equilibrium **results** (with some lag) from whatever the price of each cryptocurrency happens to be, along with the other two factors, not the other way around.

And while dedicated mining power at a given time might incentivize some to trust a cryptocurrency over others because its network is more secure, I suspect that impact is extremely limited and anyone using hashpower as a materially relevant metric to draw conclusions on a currency's price action is deluding him/herself, or at least his audience (it can make for good sound bites though).

Some misconceptions: the mining network has IV, and this IV backs the MV

Some people say bitcoin is worth something because it is "backed" by a decentralized network aggregating to the greatest computing network in the world today. This is another example of a pragmatic cognitive dissonance people tell themselves to get comfortable with a high MV to IV ratio. It's probably also a case of abstract cognitive dissonance. In the case of cryptocurrencies, MV / IV is close to infinity because IV is roughly close to zero. As we've seen in the potential other use cases of cryptocurrencies, you could argue IV is not zero, but again that's irrelevant, because IV is not MV and MV is not IV. IV is not the recipient of MV. However, if the network is robust, it will help convince MV stakeholders that it might be a preferable monetary asset than their current selection and potentially entice them to switch into it, in which case cryptocurrency MV goes up relative to MV in alternative monetary assets. One might trust a network with stronger hashpower more than the other and consequently switch to that currency to store MV, but it's not the network contributing the MV. Nothing ever contributes to MV but the monetary saver's choice of that asset.

Some misconceptions: cryptocurrencies can't be the money of tomorrow because they are not functional today

Some people like to make this claim which is blatantly self contradictory (it doesn't have to be the money of today, it's just trying to be the money of tomorrow). The fact of the matter is monetary adoption is a progressive phenomenon. And one built on burgeoning but groundbreaking technology and no regulatory backing will be even more so. It's not just a little premature to condemn to failure some obscure new kind of money created by an even more obscure anonymous group with no regulatory backing if overnight it doesn't disrupt decades of norms and traditions and fails to convince $300 trillion of monetary wealth to choose it instead. You couldn't try to expect that with a straight face. It would be like saying upon seeing the very first automobile that cars would go nowhere because there were no roads, no gas stations and the first model had an uselessly small range.

Cryptocurrencies are undergoing an adoption phase of a technological and economic nature, characterized by high levels of initial uncertainty and an inevitable series of boom bust cycles. There's just no way around it. But if successful, this uncertainty and the matching level of volatility will exponentially decrease over time. As far as money goes though, this is a never ending process. Even the leading currencies of today can experience important fluctuations at times. Eg GBP during Brexit. The relative monetary game never ends.

And now for some recurring critiques.

Some recurring critiques: volatility

We've just discussed cryptocurrency volatility. But we should add that some are already more functional that many fiats today. It all depends where you live. The phenomenon might appear strange to the privileged monetary savers of the developed world, who enjoy the luxury of relatively stable currencies (at least in the short term), the Euro, the Dollar etc, and of supporting monetary infrastructures that work well enough. But for Zimbabweans or Venezuelans, cryptocurrencies are already an immense step up vs their local alternatives. And having a properly functioning money is a matter of basic survival which is a condescending thing to sneer at from our privileged pedestals. You don't have to explain crypto to the Argentines. They understand immediately. It's no happenstance that my true eureka on the matter occurred during a trip to Buenos Aires some years ago, when looking for a place to sell my blue dollars (regular US dollars sold on the black market at a preferential black market rate vs the officially enforced level) I learned there was real appetite for bitcoin there. I can assure you the Argentines are not reckless speculators or monetary investors by nature.

Some recurring critiques: cryptocurrency networks can't handle a lot of transactions

Still mostly in their original iterations, cryptocurrency networks cannot handle heavy transaction loads. Some thoughts there.

First of all the market for transactional monetary value (read one that has a very short term redemption horizon) is a fraction of total MV. Most of MV is sitting in long term instruments, treasury bonds, gold, real estate, art. This form of monetary wealth storage does not care much to be redeemed to buy cups of coffee. We only use a tiny amount of our monetary savings on a day to day basis, and come the time to make a substantial purchase we then don't mind redeeming a monetary asset of substantial value (but still a small fraction of the total MV we own) for whatever the transactional currency of the time and place happens to be to make that purchase. It is by far of greater interest to monetary savers that the monetary assets of their choice hold their value, or even better, appreciate over time, than that it is convenient for them to be able to pay for coffee with it.

With that said, can we have our cake an eat it too? Can cryptocurrency networks scale? Credit where due, I owe the following to Andrea Antonopoulos' excellent talk on the matter. I invite you to look it up (or any of his other videos for that matter).

The keyword in understanding this issue is *network*. Networks are difficult to scale, and when well built they reach capacity as a consequence of their success, every time you enhance their capabilities. Being saturated is a good thing! At least for a time. It means more people are joining, it means you're on the right track. But this does not mean you can't find enhancements to the protocol and the infrastructure and increase capacity to accommodate for the next level of exponential growth. You figure out a way to make it ten times more efficient. And the next thing you know, inevitably, ten times more people are using it

and you have to work on it again. As Andreas elegantly put it, successful networks continuously fail to scale, gracefully.

The exact same concerns accompanied the internet's evolution from its very origins. Remember dial up and sending those emails? If you don't or weren't born yet, trust me, it was fairly laborious. Downloading a song used to be impossible. Then it got possible with mp3 but still it took an hour to download an album if you were lucky. Then the pipes got better. Then we thought voice over the internet would break it. The next thing you know the telecom companies that originally said the internet was doomed because it would never scale are using it themselves because it's cheaper. Then we thought video streaming would break the internet, and we figured that out. Next we'll think live VR will break the internet and we'll figure that out.

These things just take time, careful difficult work, patience, and **exponential not linear** solutions. You cannot solve exponential problems to exponential tech adoption curves with linear solutions. But it's probably no less narrow sighted to think that for some reason we won't be able to solve cryptocurrency scaling than it would have been to condemn the internet to be limited to handling email and word only page downloads for the rest of its life back in the 90s. And if you're familiar with the latest developments in scaling solutions, things are well on their way.

This issue was a massive red herring during the past couple of years although it's quieted down at the moment, and was heavily exploited by bitcoin rivals to make themselves a place in the race to capture MV on the false pretense that they were faster and cheaper, which happened to be the case for the mere fact that no one was using them (in other words they hadn't scaled yet) while they had solved nothing themselves but provided only marginal linear improvements, if even that. The other alternative was to be mostly centralized, in which case it's not a network, it's a private database, and that's very easy to scale, since there's mostly a single central banker, or at least a very centralized process. All those are disingenuous marketing pitches. But if I can convince you that tin cans are the future of money and convince you to switch, I can get you to surrender some of your MV to me probably at your expense, because tin cans probably aren't. In the relative world of MV, it's all fair game.

Some recurring critiques: cryptocurrency networks will devour the world's energy supply

This has been a recent favorite and it's probably a bit more legitimate. Here are a few thoughts on the matter.

First, many industries consume a lot of energy, and plenty of them have dubious social value. We don't single handedly cherry pick them out for it though and say they will ruin the world. This includes things like gold mining which for all intents and purposes is a similar pure energy drain driven mostly by the monetary adoption of gold. It's a strange avenue to pick to criticize any given industry, but since cryptocurrencies are the new kids in town, and people are looking for reasons to denigrate them, this is as

good as any. In the face of a new phenomenon, it's certainly legitimate for anyone to be concerned about the corresponding risks.

Now it's true that securing a decentralized network is an expensive proposition. But that's a necessity. Since we can't allow a final central arbiter of the truth, we need to make the process democratic, and the way to do that is to make it prohibitively expensive for a single actor to be able to temper with the network. And the way to do that is to make it very expensive to secure the network in general. This means it has to be money hungry somehow. Does this mean that money has to be spent on electricity? Not technically no, but so far so called alternative solutions like proof of stake have yet to prove they work as well, or at all for that matter. And while i'm not an expert technician and could certainly be wrong about this, my intuition is that solutions that claim to solve scaling of truly decentralized solutions without incurring a cost sound an awful lot to me like claims of having invented a perpetual motion machine. To market yourself for a time and capture some MV though, it can certainly work wonders. But maybe the coders behind the effort are actually on to something, in which case I'll be happy to have been proven wrong, as it will mean for a better protocol. Not holding my breath though.

Now this doesn't mean the situation is dire nor doomed. First of all, it seems like we're getting horrible bang for our buck now because cryptocurrency networks can barely handle transactions as is. But once they scale by orders of magnitude at the same cost and can technically handle as much as the fiat networks can, my bet is they'll be a lot more efficient than the energy hog that the traditional banking network currently is: corporate offices, bank branches, atms, armored cars moving around heavy paper and metal, data centers, most operating 24/7 etc. The jury's out for sure but i'm cautiously optimistic. Obviously if both end up living side by side it will be an addition not a replacement, but still you might have less of it.

Second of all, let's assume mining breakeven costs got much higher and the energy consumption with it. There's a very simple solution to this. Tax the miners. You can then reinvest those proceeds into green projects and bring up the breakeven cost in the process forcing the network to reduce its efforts. This reduces the security of the network to some extent but done right you could probably go a long way.

Finally cryptocurrency mining has a huge advantage in that it can operate anywhere. Its customer is an internet connection not residents of a lot of houses. This means it can tap into renewable energy sources that are too far from civilization to exploit any other way, or even help make them viable if they were just a little out of reach. This is not a panacea. It's obviously better if you're not using up energy at all. But it's a substantial advantage that used intelligently can very materially make things a lot less impactful than you might have thought.

Closing crypto thoughts

The first thing I'd emphasize is that if you're not a monetary saver, either because you have no wealth, or because it's mostly invested in IV valued assets, you don't have to bet on cryptos. You can sit back, grab

some popcorn and enjoy the show that will be watching the monetary world playing this revolution out. And should the time come that you have MV to invest in, you can reconsider your options then.

The second thing I'd emphasize is that if you are a monetary saver today, you probably can't afford to ignore this phenomenon, because you're complacently investing in fiat currencies, and if cryptocurrencies become preferred monetary assets, it will be at your expense. They just might be the new Netflix, and you're long Blockbuster entirely. Owning monetary value can only be done through monetary assets and you do not control which will be in favor tomorrow. You think you're safe in cash because you have some notion it's recognized as the safe thing to do. That is perception alone, and it is possibly a false perception. All monetary investments have risk. And that risk is monetary inflation. You must choose wisely.

Cryptocurrencies are still in their very early stages. Despite the huge inroads they've done since their inception a mere decade ago, they still represent a paltry 0.1% of GMV at the time of writing. They still face the three main hurdles we discussed on their road to mass monetary adoption. It is a path rife with volatility, uncertainty, and endless sequences of euphoria and depression. But if Christine Lagarde is correct in saying that they are going to give central banks a run for their money, the question to you as a monetary saver isn't whether you can afford to take a risk on them, but whether you can afford not to.

Part IV - On The Credit

Because I've covered money so closely, I can't finish this effort without covering two specific forms of monetary assets. The first is credit which I'll start with, the second is fiat which you'll find next. These two following sections aren't technically necessary for the general intent I embarked on, but if you're curious about having a proper foundation for all things money, I recommend them. Let's start with credit because it's shorter, and it's at the source of a massive confusion about fiat currency, which is that debt issuing governments in fiat currency they control are borrowing money. They're not.

Credit is an interesting animal in the world of monetary assets. Instead of acquiring IV from you in exchange for a monetary asset today, I promise to give you that monetary asset in the future instead. This technically creates new MV in the form of the expected value of that monetary asset once received. It's a little bit different in a couple of ways though.

First there is a chance whoever I bought my MV from in exchange for some IV doesn't honor his debt. There is credit risk. Should that occur it would happen entirely at my expense. What the IV seller typically does then is ask for more MV to be eventually delivered. Instead of 1 oz of gold today, he wants 1.1 oz at maturity for example, charging 10% for the credit risk.

Second this should not technically make the value of the underlying currency appreciate just yet. This will only happen at maturity when the IV buyer needs to repay his loan and goes out in the market to acquire physical gold, triggering increased MD for it.

Now the thing that generally happens is that the person or entity taking the credit risk is not the person selling the IV, who happens to be a merchant who doesn't necessarily specialize in taking credit risk with someone, or at least not long term credit risk. So instead, gold will be borrowed from someone else and delivered to the merchant. Now the merchant has the gold, the purchasers has his goods or services, and owes gold to the third entity. This is not relevant though. For all intents and purposes there is a delayed consequence of increasing the valuation of physical gold.

Additionally, technically physical gold's MV hasn't changed, **but**, if you have good reason to believe the gold borrower will honor his debt, it has. Because eventually he will acquire that physical gold and pay the additional price for it corresponding to that increased MD.

In other words, in the land of healthy credit, MV = physical MV + credit MV.

Credit becomes its own monetary asset, and eventually redeems to inflate the MV in the underlying monetary asset itself. Things can go wrong though, when credit gets reckless. In that case lenders for any number of reasons start lending out money to whoever asks for it and those start spending it left and right. In other words, the physical underlier is getting heavily sold into the physical MV market. This creates a monetary inflation spiral, and typically occurs when a given asset is experiencing a valuation bubble. Too much gold chasing too much bad real estate. Or too many dollars chasing too much bad real estate. If and

when the debtors can't honor their debt two things will happen. The lenders will have lost all their MV, and the lucky winners will be the ones who acquired the MV in exchange for the inflated real estate. And they can now turn around and get a lot more of it as the credit bubble inflated assets come back to earth as all the seized no money down houses from the reckless borrowers get sold at rock bottom prices. Sound familiar? It is, with a twist. Because the housing bubble you're so familiar with was fiat currency based which changes things quite a bit.

Back in the days of gold though, when the supply of the dominant monetary asset used could not be messed with (outside of the occasional new world discoveries and successful mining ventures), this is what happened. Again as with all things money this was all a relative game though. So who wins and who loses? The unfortunate lenders ultimately transferred their MV to people who had sold IV of inflated assets (read overpriced) for the physical underlier. And in the end they got more IV back from it than they had sold. Nothing is created, nothing is lost, all is transferred.

Now as we've mentioned the people lending tend to not be the ones selling the IV but entities that specialize in credit. You might have heard of them, they're typically called banks. And banks taking your gold, lending it out to someone else, only to see the gold get deposited back into them and lending it out again and again and again is where all the credit money is typically generated. This is fractional reserve banking. If things go smoothly, the bank makes some running interest which if done right covers the occasional bankruptcy. If they get reckless though, eventually they get more defaults than they can handle and they go under. Whatever gold they put into the venture, if any, they lose, and without government intervention, the rest of the losses is incurred by the people who deposited gold there for safekeeping.

The net outcome of all of this is a game of relative wealth reallocation between whoever lent and whoever was the recipient of the lent underlier in the form of MV redeemable for IV. The real wealth of the world really doesn't care who gets the stuff, MV is just there to allocate things. To a degree though. Because an economy is like a human organism, built of interconnected industries and individuals. And if too many go under, the heart can go out and the whole thing can die. This is exactly what happened during the great depression, which it took decades to recover from. And this is why governments are always so keen on bailing out economies or industries on the cusp of failure. It's a lot more cost effective than to let the whole thing implode. The question is how do you pay for that invaluable bit of life support and who foots the bill. We'll discuss this in our following part.

One final crucial bit to highlight though about credit based on an underling monetary asset no one controls the issuance of is that if the lenders get burnt, they get hurt, in favor of the final recipients of the monetary assets they lent. But the underlying monetary asset supply is never jeopardized. The other monetary savers in that asset who were not involved in this credit cycle are not harmed.

Part V - On The Fiat

Before I get into this, I need to highlight that this is a bird's eye "black box" view of issuer controlled currencies, generally referred to as fiat, which for all intents and purposes I'll refer to as governments because they are the dominant issuers of fiat today (but there's nothing to say it has to be a government).

This view is based on the premise that the government is a single entity which can technically do whatever it wants with its fiat currency, be it creating it, taxing it, distributing it, confiscating it etc. What happens inside, what organisations exist to handle it and what power they have to do so, what lawmakers chose to set as rules and guidelines, all that makes for a more granular debate about how any given fiat might evolve. That debate is important, but it happens at a lower level of analysis on a case by case basis. At the end of the day, the fundamental thing to understand and what we're going over here, is the consequences of the absolute power any government has as a whole over the creation, distribution and transmission of its currency.

Governments have a few ways to get their populations to contribute the goods and services required to support public services, in other words to tax them.

The first is to simply force whoever is needed to work for the government to do so for free. This is generally called slavery and it tends to be unpopular, at least with a material portion of developed societies. It obviously has a rich presence in history, but it seems to be mostly on its way out.

The second way is to get government workers to do what they need to do, and then ask them what they'd like in exchange for their efforts. You then force the providers of those things to reward the original government workers for their government services, not entirely mind you because everyone needs to contribute a little bit for free. Once that is done, you then have to do the same with the second round of citizens who have been unfairly inconvenienced at the expense of the other non government workers who haven't done anything yet. Thus ensues an endless series of rounds of trying to allocate the burden of running the government to everyone fairly enough. This is basically taxation in the form centralized bartering. For obvious reasons this is a logistical non starter and overall nightmare. And to my knowledge it's all but never been done. Bartering is virtually always a highly inefficient mechanism, and in our case, deeply unsuitable to carrying out complex public needs.

The third option is to tax the population first in a currency that has already been generally adopted and to then pay government workers with it. This is how things generally worked for most of developed civilization, mostly using gold and silver. But this has its problems. If an enemy shows up at your gates and you have a day to raise an army, that might be too short notice to raise the amount of gold you need to pay them. Same thing if the economy is about to go under unless you can throw an IV drip in it.

The fourth option is then to provide gold ious instead. If they felt the government trustworthy (read strong enough to eventually enforce taxation to get physical gold to eventually pay them with), our soldiers agreed to take those instead. This is standard credit we've gone over in the previous part.

This was an improvement. But it still had the pesky issue of having to eventually tax that gold to honor your debts, which presents all sorts of issues. So governments got smarter about it, or you might just say, bolder. They realized (consciously or not) that since monetary value was entirely abstract, why bother with something real you couldn't manufacture and control when you could just make your own.

The birth of artificial money in its first iteration, fiat money

Fiat is the first example of man made money. And it has a few moving pieces which make it a more peculiar animal although a really interesting one. A lot of what I'm about to explain falls under the umbrella of MMT, modern monetary theory, and if you're familiar with it then I have not much to teach you. If you ask me calling it a theory is a bit pretentious, I just see it as just a straightforward deconstruction of what fiat is and how it works, but there are some who would disagree. The best way to understand it is to start from the ground up and break it all down, step by step.

Start with a nation with a fresh new government, and no fiat money in circulation. It needs to pay a soldier to guard the wall and wants to use its own version of dollars to do so. Here's what it can't do. It can't borrow those dollars from anyone to pay the soldiers. There are none in circulation! Let that sink in for a moment. How can you borrow that which doesn't exist.

So you create dollars and spend them. Now if that's all you do, you are selling MV to the soldier via these newly created dollars. Exclusively. And if he doesn't believe your dollars' MV will hold, he might not accept your dollars as payment. So you tell him not to worry, that there will be demand for these dollars because we are going to tax them. In other words, we are going to force people to get some from you and doing so you'll get some IV back for your services, which they'll have to offer you in return. So the first crucial bit to understand is:

You create and spend first, then tax, if you want

In other words. Government taxation of government controlled fiat does not fund the government. Creating new issuance and spending it does. And if you want to tax people next to provide an IV valuation floor to that money, it's your choice. However if the government workers were satisfied that that currency's monetary adoption would give it sustainable MV, that is an entirely unnecessary thing to do.

The misconception of fiat monetary value originating from taxation

Fiat currency is generally explained to us as money created by a government with a value coming from the fact that it is taxed. As with all things money this is again confusing its intrinsic with its monetary value.

Taxing money is not what gives it monetary value, as nothing ever does but abstract choice. **Taxing money gives it IV**. The government has created this IV, and its utility is it allows those with a tax liability to avoid jail time or having their real assets seized or a combination thereof. This is not MV! But like any asset it can develop MV, if it experiences MD. It will arise the second anyone chooses to acquire some of it not because he needs to pay taxes but to store future purchasing power. In that case he pays more than its IV for it and out of thin air monetary value starts to build.

Now we have two important scenarios to consider. In the first case, government taxes all it has spent, in effect retiring the money it had originally created. The government can say the money still exists, but fiat money sitting in a government's coffers is meaningless, since they own the press. It doesn't make the government rich or poor. It's irrelevant. The only fiat money of any relevance to the world is that sitting in the hands of private individuals and entities. In this scenario fiat money, if it ever built up MD, had a short life. Mind you if there were any monetary savers and they were clever enough, they would have realized they now were the sole beneficiaries of get out of jail cards and could have charged a pretty penny for it. But this is more the equivalent of hoarding a commodity in the real world that people desperately need than monetary saving.

What is important to understand however is that taxed money cannot serve the purpose of storing MV, because it gets withdrawn from circulation. And if a government were to tax all its money, read, have a budget excess, it would be impossible to use it to store MV… **because it would be gone**.

In other words, the untaxed portion of fiat issuance is the only thing that can be adopted as a monetary asset to store MV. Balance the budget, and retire your so called debt, and Americans would have to look elsewhere for money. IV is not MV and MV is not IV.

Now here's the clever bit. In the second scenario, you don't tax it all. There is now some in circulation that does not have IV, by definition, because the government isn't asking for it. This means when those government workers were paid, it was with a combination of IV and MV. That's quite the leap of faith! If the government never taxed anyone again, and people decided they didn't care for this new money, those government workers would not be able to get anything out of that MV. They would have worked more than the average citizen for nothing.

But it worked, again, because most of us generally accept things at whatever value they seem to have on a reasonable observability time frame. We typically never run any kind of intrinsic analysis to determine how much monetary value we're paying for something and whether we think it'll hold or not. By creating a perceived sense of value through IV in the form of a capacity for some of it to honor tax liabilities, the

government has helped stimulate MD for that currency, and it can now live a life of its own as predominantly money. We see dollars tend to consistently be used for money and hold their value somewhat well, and we accept them. Sometimes we do so assuming their value is predominantly intrinsic, and we're wrong, because dollar IV is now a fraction of dollar MV.

Today, fiat currency valuations are mostly monetary. Their IV is only a minor fraction of their total value, and again, never the container of MV. And you really don't need taxes to create material MD for a government currency, you just have to convince a collective to create and use one and its demand will be born out of saving needs. The GOP would happily cut all taxes to zero tomorrow if they could and the dollar would hold its value quite well. They're certainly trying.

This is not to say technically that the IVs of the world's fiat currencies couldn't shoot up tomorrow. If the world's government proudly announced they would never spend another newly minted dime and would overnight tax the entirety of currency in circulation, intrinsic valuation would explode. This leads to all sorts of interesting thought experiments about the impact of taxation on fiat currency valuation, too long for this piece. Feel free to mentally juggle with it though to build a stronger intuition of fiat currencies.

The current state of affairs though is that by far the great majority of fiat valuations today is monetary. This is the result of years of governments issuing additional currency either in the form of the actual units or in debt redeemable in it, and spending more than they collected in taxes. And today that accumulated value dwarves its use as a vehicle to pay off taxes. I assure you the Chinese are not sitting on trillions of US dollars because there's a tremendous taxation demand for it. And you don't need the GOP to be in power for that either.

The fallacy of fiat government debt

There are two components to credit risk which accompanies any debt: the capability to pay and the willingness to pay. The seismic difference of so called federal fiat debt is that the risk of its non capability to pay is exactly zero. If you own the press, you can always pay. The only thing leftover is the willingness to pay which technically doesn't have to be zero, but it's entirely a matter of choice, not capability. Because our dear United States congressmen have generally little to no understanding of any of this, they enjoy on occasion engaging in absurd recurring games of political posturing by threatening to not authorize a spending bill that would in effect honor this so called debt that we have the entire capability of paying by construct. There has so far been enough sanity going around to realize that whatever effectiveness this might have in helping to reign in spending one might deem reckless, it would be cataclysmically worse to the general perception of the dollar itself to deliberately not make whole your creditor when you had the trivial capacity to do so.

But there is no law of the universe that says congress couldn't be stupid enough to fail to realize this and to default on its so called debt, refusing to simply amend some bank account 0s and 1s of the corresponding creditors on the absurd completely self defeating altar of fiscal responsibility. This would in effect act as a surgical 100% overnight tax on those particular bondholders and I can assure you all hell

would break loose with the other holders of the $21 trillion of so called debt. The consequence would be the obliteration of the MV of dollars in circulation, which is most of it, as dollar savers would rush for the exists into alternative monetary assets. The irony is if the government redeemed all those debt dollars overnight for cash instead, absolutely nothing would change in the world, except perhaps that your previous bond holders would demand if by any chance you could sell them some interest bearing debt instead.

Federal fiat debt and cash are virtually the same things, and perceptively identical to their owners

The idea of a government borrowing money it controls the issuance of is ludicrous at best. But here's a funny game all fiat issuing governments like to play nonetheless. Instead of just creating and spending money they control the issuance of, they mostly create and spend instruments redeemable in that currency instead. It's something even a little bit stranger than that. They generally sell those instruments back to people actually holding some of the original money, and then spend the money collected. Mind you they were only able to do this once there was enough of it in circulation. But eventually they can because the amount they've created and spent up till that point dwarves their day to day needs.

At least that's what it looks like optically. There are no dollars actually moving around, these are just database entries. So on the one hand you reduce someone's bank account and put in his brokerage account something called debt that will redeem back to dollars eventually. And then in someone else's bank account you credit a dollar balance. It looks like you borrowed from someone to pay another, but that's nonsense. If you own the press, these are entirely independent operations and you the federal government controls all the dollar ledgers.

Remember when we discussed our new nation and you understood you had to first create a bunch of dollars. You might have thought to yourself, well ok fine, in the beginning there's no debt, and you create some new currency, but THEN you borrow it right? This might have been how you overcame the weirdness of the origin of fiat currency and reconciled it with your normal understanding of the situation, hoping to just ignore that annoying initial truth. But you're deceiving yourself in thinking that way.

The reason you're inclined to believe in a *borrowing money first world* for fiat is that that's your personal state of affairs, and the state of affair of any entity using a money they do not control. When you need dollars but don't have them, you have to borrow them. In effect you are selling dollar denominated debt. This is what governments did back in the days of gold with their gold IOUs. But with fiat issuing governments, this is an absurd thing to do. Why? Because why borrow something you can create?

There are a couple main reasons this is done though. The first might be from plain old habit. Our dollars used to be equivalent to gold, meaning you could exchange them for gold. So we had to actually issue real debt, meaning a promise to pay back a currency we did not control, gold. But once we got off the gold standard, we could have gotten rid of debt all togethĬer and called things what they were, money we controlled the issuance of with a bit of interest on top because we think it's a good idea.

This brings up a second reason we perpetuate this silly game. Issuing something called debt rides on the perception that traditional debt does not jeopardize the real supply of the underlying currency. When I borrow gold via debt, the goldholders of the world know I am not compromising the actual entire supply of gold. There are more gold monetary instruments in circulation, paper gold on top of physical gold, but I know for a fact the only way to redeem paper gold is to find some gold amongst the available supply which is mostly fixed (ignoring additional mining), so this act has no bearing on the supply of the underlying currency. And since value all comes from supply and demand, this is crucial.

But now if my debitor controls the press issuing the underlying currency, I have no such guarantee! He could, come expiration date, source some of those dollars to pay me back (either through taxation or by owning dollar producing assets such as stocks), but if he chooses not to, he will print more dollars, increasing the supply. This will act as a tax on all monetary savers. This will trigger monetary inflation of that currency, eroding their relative power in the process. Note that this occured when the so called debt was issued, which was when in effect new dollars were created and spent.

In other words, since i'm mostly invested in MV by holding dollars in cash or debt form, I am at the mercy of the government's propensity to create more of these dollars in cash or debt form, and inflate the monetary purchasing power of the former. But if they're issuing debt, I might be inclined to think eventually that debt will be "paid off", and paid off by acquiring dollars back out from circulation. This is an optical illusion which depends entirely on the government's future taxation plans. And there is exactly zero assurance this will be the case. If you take a look at the so called debt clock, it just keeps going up. This is because America has a tendency to continuously spend more than it taxes or makes. There's an excellent reason for this.

This actually works just fine although it creates a world of confusion

It probably won't come as a shock to you that creating and spending new money is a remarkably more politically friendly tool for extracting goods and services from your constituents than taxing and then spending it is. Society tolerates monetary inflation orders of magnitude better than taxation. And when you do it with debt, you make it sound like you'll pay it back by retiring dollars and not eroding dollar supply, hence dollar purchasing power. But there's no reason to think this should ever be the case. Fiat created money born into the world and not taxed, in cash or debt form, just becomes an additional monetary vehicle, in other words, it becomes new dollars, in the hands of private citizens. And the more of it there is the less each dollar's purchasing power is worth, as per the game of special monetary relativity.

Dollar debt is equivalent to cash and an inflationary tax on dollar savers just the same

Government fiat debt, until it is eventually taxed, is always simply a monetary tax on savers in that currency. The US government is never indebted to anyone. They can always spend more by creating more money, even in the form of debt. And when they do, they are imposing a monetary tax on whoever happens to own US dollars, in cash or debt form. In other words, government spending taxes USD monetary savers entirely and no one else. Whereas a tax impacts whomever is taxed, whether he happens

to hold dollars or not. It is a very clever system of wealth reallocation. And done responsibly it can go on endlessly. And it does. The consequences of so called paying back our national debt would be to obliterate that amount of private savings in the form of MV and nothing more. There is exactly zero reason to think that would be a good idea. The world's fiat issuing governments can carry on forever with increasing levels of government bonds.

The reason I earlier mentioned we probably don't want the fiat system to disappear altogether and to go back to currencies we don't control, is that in times of crisis being able to print money into thin air and putting the economy on life support can literally save lives. But a parallel economy based on a stateless deflationary currency could act as a valuable check and balance on reckless government spending, in the form of monetary savers refusing additional fiat to store MV if they felt things were getting out of hand.

The myth of the need to balance the federal budget

You hear this blurted out so intuitively anytime it's asked you wonder if people even hear the question or have put any thought into it. No, you never need to balance the federal budget. What you need to do is spend intelligently, ie allocate resources intelligently. If you do this via a reasonable bit of continuous monetary inflation, your fiat currency will remain stable enough, it will continue to be employed and recognized by most economic stakeholders, even though the total amount of units in circulation will continue to rise, and the unit value (but not the total) will tend to go down over time. And if your efforts are intelligent, and spending creates a social environment which fosters prosperity, the total wealth of the nation will grow, which you can then decide how to be distribute. **Increasing that total amount of wealth is all that matters.** Doing so using an inflationary monetary asset is perfectly fine and fiat in circulation can keep growing in perpetuity, becoming ever increasing MV in the hands of private savers. You will never have to **pay anyone back**. People will redeem the value they've saved in your fiat currency by selling it to new monetary savers who chose it, not by calling up uncle Sam. This will work fine, as long as you act responsibly enough, and the day doesn't come that they stop accepting your fiat for goods and services, as they are now in Venezuela.

The oddity of paying interest on debt you control the issuance of

Here's a last weird thing about issuing fiat debt, in short to long dated form. It can come with interest. This is a choice, not a requirement. If you think otherwise, have a look at Japan, with its world record breaking debt to GDP ratio, and zero interest rates, and general continuous deflation. Since there is virtually zero credit risk to fiat debt, fiat debt is functionally identical to the currency itself and in a zero interest rate world they would be exactly identical.

However, for various reasons, central banks sometimes chose to pay dollar holders some interest. The reason this is weird is that, all this really does, at the base currency level, is just create more additional units. But because this is all a relative game, the only thing that ends up happening is that while the dollar savers end up with more dollars, they also end up with the same amount relative to each other. In other words nothing has functionally changed.

So why bother? There are a number of mostly psychological reasons central banks do this and playing out the various scenarios is outside the purview of this piece, but it's a highly interesting exercise.

The day we got off the gold standard

A final word on this delightful little event in the history of money. You might have heard that one day we got off the gold standard. This was the day that the dollar spread its wings, and was no longer redeemable for gold as it had been until then. And it kept on working. There were consequences to be sure, but behold the miracle of money yet again. Hopefully things are getting clear enough to you now that you are not entirely surprised about this. People had gotten used to dollars before being worth what they were worth, and that general perception had nothing to do with them being redeemable for gold. The herd behavior still working its magic, society assumed dollar MD hadn't changed over night, by observation alone and the dollar's abstract value held accordingly.

Part VI - Random Closing Thoughts

Art: the curious monetary asset

Like any other asset, art can experience MD. The quirky thing about that is when it does, it gains a patina of IV. Determining the IV of art is a fuzzy exercise, but one way to estimate it would be the sum value of tickets you can sell by displaying it in a museum. And most customers of the visual arts world are like yours truly, we don't know much about it, and we'll pay to go see whatever experts and museums seem to tell us is worthy to see, to add to our cultural experience. So when some new middle eastern nation decides to build its next Louvre and plunks down $450mm on a presumed new Leonardo, they know it will draw crowds, and are paying up for IV accordingly. The interesting bit is if they hadn't spent that much, ticket sales would have likely been much lower. In this odd case, IV is a bit of a self-fulfilling animal.

More generally though, new artists prop up every day and they get acquired and hoarded by rich people. They most often care virtually nothing about the art, except maybe for the added value it provides in providing some intellectual bragging rights at their next cocktail party. What they care about immensely more is that that particular artist will build up tremendous MD and MV in the process. Artists are just like new cryptocurrencies, building up a brand. It's all fair game. But it's mostly a monetary game, IV has very little to do with it. Most of these paintings sit in storage in dark rooms, just like the gold at fort knox, their owners hoping they will experience MD.

Whether they like it or not, most artists are in the money making business a lot more than they might think or care to admit. By money making, I mean the MV selling business.

Gold: the slightly less curious monetary asset

Gold also lives at somewhat of a crossroads between IV and MV. I don't think it's being crudely materialistic to suggest that in our material world, the appeal of gold in its use as jewelry (as it is with diamonds), isn't in its esthetics. You could recreate the esthetics of gold by gold plating other metals and most people wouldn't know the difference. For better or worse, the whole point of expensive jewelry is precisely to be expensive, display wealth, prove you "care for someone" and so forth. Correspondingly, this specific demand creates its own appeal by making gold increasingly valuable, thus making it more expensive, thus increasing its appeal etc.

With that said, while I can't prove it, I surmise that more than half of gold's value is held for MV purposes.

IV is not utility

You might confuse IV with some sort of inherent utility but it's important to understand that they are two very different things. IV is simply the economic result of a supply demand curve leading to a price being determined for something. They're not entirely unrelated, (something with no utility to anyone won't have any IV), but IV says just about nothing about the utility of something, quantitatively speaking.

A breath of air for example has infinite utility to me in the next minute and gold has relatively zero utility to me in comparison. I'll still pay a lot more for gold because quality air supply is functionally infinite (where I live) while gold is much more rare but still has some utility.

A large investor in Apple recently commented how cheap the stock was highlighting how tremendously underpriced the iphone was considering its utility. He might have been correct about stock (disclosure: I am long Apple) but it's not because the iphone is underpriced. Iphone prices are optimally set within a very competitive market and this price has very little to do with absolute utility and just about everything to do with supply and demand.

A better proxy for the utility of anything to anyone is what you'd be willing to pay for it if it was the only one of its kind available to you in the world. I haven't put extensive thought into the matter but intuitively I would probably give something like 15% of my current net worth to keep having a smartphone for the rest of my life if I had no other choice for example. But it's quite the useless exercise and certainly doesn't mean Tim Cook can start charging a fortune for iphones. It can help put things in perspective though and it's never a bad exercise to take a step back from time to time and realize just how far humanity has come technologically, especially for the most basic of things such as life saving basic modern medicine.

Equity investors' gross misunderstandings of MV

There are brilliant investors out there who are equity people. They understand businesses and their income streams like no one else. But they are entirely clueless about MV. I could be wrong, but I seriously doubt their characterization of cryptocurrencies as things like toxic rat poison is a concern over the return of stateless money.

My personal guess is that they don't understand MV and criticize it in all the forms it takes they are not familiar with. Dollars seem legitimate to them so its fine. But if MV lives elsewhere they pull out the old bubble fallacy, which in their minds is an equity bubble, which is not ok. To pound a dead horse a mile into the ground, **MV is a bubble by construct.** There's no other way. It's the exact same thing with dollars.

And a quip about how silly we are to dig up gold to only bury it again sounds about as clever as its wrong. The first time I heard it I thought it was rather brilliant. But that was before I properly understood the

origin, power and indispensability of money. To be fair, it's not technically wrong. But if gold is the best kind of money for the world, it makes perfect sense to go to all that trouble to get it out of the ground only to put it back in a vault the next day. Again, without money, we are stuck in the dark ages, and humanity has every reason to adopt the monetary vehicles that are the most appropriate for that purpose.

A much more interesting observation one might make is that the world's major governments today, its greatest advocates for the superior nature of the fiat currencies they issue and control, still find it wise to be huge hoarders of gold. If their currencies are so superior, why on earth bother? There is nothing silly about mining gold in order to simply put it back in a vault. It is simply an inevitable byproduct of adopting gold as a monetary vehicle which still happens to have remaining supply to be found beneath the ground. If we had managed to unearth all the gold on earth and earth was the only place in the universe where gold could be found, then the energy spent mining it would end, along with the monetary inflationary byproduct of that effort. Perhaps people are going through the apparently silly effort of mining more gold, not because it is silly but because gold to this day has offered qualities no fiat has been able to. With the advent of cryptocurrencies though, things could finally change.

Valuing MV

Monetary assets are worth what they're worth today. No more, no less. And while you can run a wide range of cash flow scenarios for any given stock, and come up with a reasonable bound at any given time for a reasonable time frame, for money, that's an absurd effort. The price of a monetary asset is the result of a fairly known supply coupled with a completely elective demand. There is no "correct value" for monetary assets, it's a constantly moving abstract target and its "correct value" at any given time is by definition what it's currently trading for, no more no less. Opinionating on longer term trends might be a little more legitimate. But I would generate recommend discarding short term projections by various market pundits, even more so than those making short term recommendations in stocks (which I generally recommend as well). Way too many things out of their hands can happen than they could possibly have a handle on.

Wall street getting in on the crypto craze

Crypto currencies were born out of a bit of a counterculture, one that felt that fiat currencies were deeply flawed instruments in the hands of at best incompetent officials, and dreamed that this technology would be a vital new solution in humanity's endless struggle for individual freedom. There's nothing wrong with these aspirations and there's some truth to them. But there's a bit of an irony in hearing these individuals aspiring to ideals of decentralization and freedom wishing that actors they naturally assume are ill intended should not have the right to mess with their creations. You have to decide though, either your currency is free to use and decentralized, or its not. They are however, and for better or worse, wall street and the finance community as a whole will get involved.

I'll fully recognize my bias as a wall street professional, but for all the negative perceptions driven by wall street's excesses, in particular obviously the 2008 financial crisis, there are plenty of good uses for

ETFs, derivatives and other services which can help people gain useful exposure to assets, and in this case cryptocurrencies, without it being a harm to them, and possibly benefiting them.

To take a simple example, if you care to store wealth independently, in a decentralized monetary asset, and care to use the tax benefits of a retirement account, you will not be able to do so without an ETF. This is one of numerous perfectly legitimate uses of financial instruments around cryptocurrencies. It is simply naive to aspire to becoming a dominant global monetary asset and not be exposed to such products eventually. The main role of financial institutions in the end, is to help shift risk exposure around. Cryptocurrencies are risk assets and they will be drive this interest just as all other assets have before. And it will probably be fine. Although it would be utopian to think it will be seamless or without controversy. But that kind of messiness is what democracies are built on and cryptocurrencies are inherently democratic animals.

Cringing things people say, and eventual comments

It's not money, it's a bubble! Precisely wrong. Remove "not" and it's entirely correct.

It can't be money, it's backed by nothing! Precisely wrong. MV cannot be backed by anything.

But they're just hoarding it! Yes that's the whole point.

It's pointless, nobody's transacting with it

The redemption horizon of the vast majority of MV is demonstrably medium to long dated. The market value of transactional monetary value is trivially small compared to the rest. Most wealthy monetary savers typically aren't going to need to spend their money for a very long time, if ever. They generally just do all they can to pass it on to their kids. The transactional concerns regarding cryptocurrencies have been massive red herrings exploited at nauseam by smaller rivals of leading contenders. I do expect the issue to get resolved over time, but it's chronically overblown.

This asset will go to zero

Predictions without timelines are entirely irrelevant, and bad media pundits use them constantly to sound clever, knowing they can never be proved wrong, but when and if their prediction comes to pass they can say I told you so. This is especially nonsensical in the world of money. In the world of monetary value, the only relevant concern is how much purchasing power my monetary asset will have come my monetary redemption date, ie when I'll try to redeem it for IV. Bitcoin is going to 0 is a painfully stupid comment to make, unless you throw a timeline on it. And I've heard some very smart people make it. Bitcoin is worth around $6500 at the time of writing and if you had paid that a couple months ago, it would have preserved your wealth just fine and done its job. If you paid $20000 it did not, and if you paid $100 it crushed it. It is entirely irrelevant to you if the next day it does go to 0.

This is obviously a bit of a backhanded compliment, but not entirely. For all his faults an ivy league school professor at least had the courage to claim bitcoin would go to $10 in six months back in 2014. He had no understanding of monetary value, but at least he had the integrity to properly put his reputation on the line.

FX gains aren't legitimate

They might not be, but early owners of anything that appreciates in IV are very often just lucky themselves and not contributing anything particular to society either. They probably don't deserve their newfound wealth anymore but no one seems to complain quite as much. I'm not sure why the Middle East should have gotten off working for so long because it was blessed with oil fields and that that should be any more deserved than someone who magically unearthed a Picasso out of their basement, or bought some bitcoin in 2010 for pocket change. But certain people like to think so.

A good friend of mine has a neighbor who bought some illustrious artwork for pocket change a few decades ago, and every once in a while clips some off to finance his lifestyle. He lucked out with the gods of MV. Such is life.

Luxury real estate

I have a colleague who's been calling for the bursting of the so called Toronto real estate bubble for years now. In my humble opinion, the Chinese have taken a monetary liking to Toronto real estate, and that so called bubble is of a monetary nature. This has been happening in all the major cities of the world and explains all those dark, empty apartments bought through endless streams of shady special purpose vehicles. You can spot them in their glorious empty darkness in the fanciest of buildings walking through midtown NYC at night and in plenty of other neighborhoods of the world's greatest cities. Apartments in these niche markets are acting like just another piggy bank for the wealthy, at the detriment of the local population. This is why in those cities rental yields are so poor, because the total purchase price is materially disconnected from IV, and the locals who need to pay their rent will only pay a rent that would justify IV.

Like so many others, my colleague is fundamentally confusing IV and MV. And until the eventual day the Chinese find something they prefer he'll continue to frustratingly scratch his head and call for the so called bursting of this particular money bubble. But he doesn't have a crystal ball, nor a mind reading device into the future intentions of Chinese monetary savers. Nor does anyone.