



We're going to make an odd – perhaps an outrageous – proposition. Probably no investment professional has suggested something as contrary to common sense to you as this. There is an investment that has a very high chance, even the probability, of going to zero. We believe that most investors should have some small exposure to bitcoin. The question is how small. Because for the cost of a family dinner out, your financial position could be demonstrably and permanently enhanced. And here's why.

Part I: A Dangerous Time for Long-Term Capital

Asset prices and yields are at levels they've never been before; and not in a good way. People with substantial capital to protect, who must have a long-term outlook, have a vested interest in protection of principal, including effective diversification of their assets. Once those essentials are in place, a secondary necessity is a reasonable return on that capital.

As to protection of capital, even the portfolios of pension funds, insurance companies and banks are replete with low-yielding—in many cases, negatively-yielding—government paper. These are considered the low risk assets.

In other words, a 10-year Swiss government bond with a negative yield is considered a low-risk asset¹. It is easy enough to demonstrate that if it were to yield just 3%, the holder of that instrument would experience a calamitous loss. It is likewise considered prudent that the \$65 billion in the Vanguard Total International Bond ETF² (³) (with only a 0.7% yield for a 9-year average maturity) has 21% exposure to Japanese bonds, primarily government bonds, much of which trade at a negative yield. As of November 14th, Bloomberg reported that there was \$8.1 trillion of negative yielding sovereign debt in the world⁴. So, a great deal of the world's money as a store of value— even in the form of bank deposits, government bonds, and corporate bonds—generates a negative rate of return.

Further, it is the well announced intention of the major central banks to continue to maintain interest rates below inflation rates. This guarantees a loss of purchasing power even when holding bonds with positive yields. This has not been true in the U.S. and most industrial developed nations since 1981, because as interest rates declined from those highs, bonds experienced capital appreciation. But, the era of such gains is pretty much over, rates having reached historic lows, and whatever little interest is generated is subject to taxation. In the U.S., the money supply (M2) this year through December 19th has expanded by 7.4%⁵. And that wasn't from robust economic activity. That is devaluation at work.

Part II: Emergence of a New Asset Class and Store of Value

Here, let us bring up an asset that is perhaps the most volatile in the world, and is probably correlated with nothing else. In principle, that makes it one of the best portfolio diversifiers in the world, and through a few simple exercises we hope to demonstrate that it is a potential source of return so enormous that just about every portfolio should hold some. That is a highly controversial statement, since virtually all

¹ As of 12/30/16, the Swiss Government Bond 10 Year Generic mid yield was -0.187%. Source: Bloomberg

² As of November 30, 2016. Source: Vanguard.

³ Formally, the Bloomberg Barclays Global Aggregate ex-USD Float Adjusted RIC Capped Index (USD Hedged). Weightings as of November 30th.

⁴ <https://www.bloomberg.com/news/articles/2016-11-15/negative-yielding-bonds-plummet-to-8-7-trillion-after-trump-win>

⁵ <https://fred.stlouisfed.org/series/M2>



financial practitioners, including financial planners, and especially academic economists, are united in the belief that this is a momentary fad that will soon pass.

We're speaking of bitcoin. Bitcoin is a cryptocurrency that was created in 2009, and, as it is software, it exists only in digital form. Bitcoin was created as a response to the Financial Crisis of 2007/2008 and the decisions of the world's central banks to print money and expand their balance sheets to an unprecedented degree. The global debt-to-GDP ratio is now at an all-time high. It is only reasonable that some market participants would seek to create a currency free from regulation – or as some would say, manipulation – by the world's central banks.

There is much written and debated about the technical structure of bitcoin and the manner in which it is produced, transacted in, and stored or secured. Those topics will not be covered here. The purpose here is simply to demonstrate how even a modest acceptance of bitcoin in just one or a few specific markets would produce a level of return sufficient to meaningfully and permanently improve someone's financial life. That result would not even require full acceptance of bitcoin as a disruptive technology. After that, we'll cover the issue of prudence in purchasing such a controversial asset and why, paradoxically, it is the essence of prudence to do so.

Two technical aspects of bitcoin must be stated at the outset: it cannot be counterfeited (since all bitcoins in existence are always visible, in computers around the world, in the Blockchain ledger that accumulates every successive bitcoin transaction); and it can't be devalued. As a function of its coding, there will never be more than 21 million bitcoins. As of December 31, 2016, there were 16 million in circulation⁶. The last bitcoin will be produced on May 7, 2140, so the rate of increase to that limit will be exceedingly modest. This is structurally different from all other accepted currencies, the so-called fiat currencies. For the fiat currencies, the ones we know and use, the central banks, not infrequently under great pressure from their central government, expand the amount of currency to the degree considered necessary. This has been a complaint about money throughout the history of coinage and currency.

Neither have defensive alternatives, such as gold, ever been able to escape the confounding impact of demand upon supply. For instance, the inflationary pressures of the 1970s were certainly responsible for the increase in the demand for and, consequently, the price of gold during that decade. This, in turn, stimulated exploration, which then enhanced supply. Eventually, the price of gold declined precipitously.

Bitcoin, in contradistinction, is fixed in supply. If it were accepted as an asset class and, therefore, as a store of value, why should not this store of value be equivalent in capitalization or value to other stores of value? *In other words, if supply is fixed, the only rationing mechanism remaining is price.*

Part III: How to Calculate its Potential Value (You Can Do This At Home)

Bearing in mind the preceding discussion, a purchase of bitcoin is nothing other than a short sale of the currencies of the world. Merely by standing still, bitcoin would become more valuable as other currencies devalue. For instance, the value of cash savings (or the face value of a 10-year bond, for that matter), is its nominal value. If inflation or devaluation of the holder's currency over that span of time were at a 3%

⁶ Source: blockchain.info



annual rate, then the cash or the bond would only be worth 74% of its nominal value in terms of purchasing power. The bond is paid off in nominal, not inflation-adjusted money.

So, what if bitcoin were to have no other value than that it gains enough confidence among the U.S. citizenry that they decide to hold one-third of their cash and cash equivalents, such as money market funds and time deposits, in bitcoin? Since the U.S. money supply (M2) is \$13 trillion, one-third of that would be \$4.3 trillion. At the recent (December 30th) bitcoin price of \$960, and given 16 million outstanding bitcoins, the market value of all the existing bitcoins today is approximately \$15.4 billion. If there is \$4.3 trillion of demand for it, then the market value of bitcoin would expand by 279x.

And what if merely the holders of negative yielding sovereign debt in the world, which is now about \$8.1 trillion, were, over some period of years, to sell those in exchange for bitcoin? That is 526x the current market capitalization of bitcoin. Between those two applications alone, bitcoin would have to be 805x more valuable.

For people less comfortable with the abstractions of money supply and negative yielding sovereign debt, here is a closer-to-home example. You buy something at a store and pay using a Visa card. The store pays a 3% fee. Let us say the store has just about a 3% profit margin, which is normal enough. Without the Visa transaction fee, the retailer would likely earn a 6% profit margin, not 3%. So the retailer, in theory, sacrifices half its profits to allow customers to use a credit card. Clearly, it is in the retailer's interest to have peer-to-peer transactions.

There are now a handful of major merchants, like Dell, Expedia and Microsoft, that accept bitcoin, either directly or indirectly – call them early adopters. One can't know, and neither can they, whether the many technical, regulatory and other impediments to wider usage will be overcome. They are substantial. The rejoinder of an optimist might be that where there's a will, there's a way. The outcome, though, is simply not subject to any form of reliable prediction.

But, for the sake of the exercise, the gross retail payment value charged on just the three major U.S. credit card company networks (Visa, MasterCard and American Express), both credit and debit card volumes, in their most recent fiscal year, totaled \$13.3 trillion. If one-third of such payments were ultimately to be made with bitcoin, that would be \$4.4 trillion of volume. That is 280x the current market capitalization of bitcoin. That excludes non-U.S. credit card companies and the significant potential in emerging markets.

Speaking of emerging markets, one final sub-market example of many. In India, in late 2016, the government outlawed two of the largest denominations of paper currency in order to try to suppress the enormous amount of undeclared (and untaxed) income and transactions in money earned in this way. These denominations were to become worthless by year-end unless exchanged for new, smaller notes. However, the limit on such exchange was quite low. Anyone wishing to exchange more than that limit would be required to explain exactly how that money was earned and demonstrate that taxes were paid on it. If not satisfactorily demonstrated, taxes would be levied at some multiples of the face value of that cash. There was a nationwide panic to 'clean' the money, which could not be done in such volume in so short a time. Bags of cash were found discarded in public trash and floating down rivers. China, which has strict currency controls, is constantly trying to restrain citizens who wish to withdraw some of their savings beyond their borders.



It is perhaps not unrelated to the natural concerns of the citizenry of those two countries that the demand for gold by each in 2015 was almost identical: 228 tons in China, and 195 tons in India⁷. Together, at the December 30, 2016 price of \$1,152 per ounce, that is \$15.6 billion of annual demand for gold from those two nations alone, which is just about exactly the entire market value of bitcoin, per year. It would not be easy for the average Chinese or Indian saver to store gold extraterritorially. Bitcoin is borderless.

Part IV: Imprudence or Wisdom, Which is It?

There are two reasons it is so natural to reject the notion of buying something that has a great possibility of going to zero. One is that we are accustomed to a reasonable upper limit of success. Success might be a 50% return or a double or a triple. For most of us, that level of possible return is simply not worth the risk. But neither are we accustomed to considering a 1,000-to-1 result. A 1,000-fold payoff requires at least a moment or two of reflection.

Second, though, we're also accustomed to having to make a significant investment in order to benefit from the possible high-return opportunity. But with a 1,000:1 level of possible return, one can make an entirely insignificant investment – it is not that the investment is without risk, it is merely that the risk can be mediated by the appropriate sizing of the investment.

So, let's apply those numbers to a relevant, real-world circumstance. Say that, in investment-speak, one were to put 25 basis points, or one quarter of 1%, of a portfolio in bitcoin. In dollar terms, that would be \$250 worth in a \$100,000 portfolio, or \$2,500 in a \$1 million portfolio. The reference point for the first example might be dinner out with spouse and in-laws; the second might be the unfortunate vacation that was a mistake from start to finish. In any event, the average portfolio goes up or down by at least that much every day. In whichever manner we choose to think about it; it is an amount of money that will not, in the scheme of one's ordinary life, be missed, even if it goes to zero.

Now, what if that \$250 were, in fact, to go up 1,000-fold, as in one of the modest-market-acceptance, non-disruptive-technology success scenarios for bitcoin described above? That would make it worth \$250,000; plus, there's the original \$100,000 portfolio, for \$350,000 in total. Or, the \$2,500 in the \$1 million portfolio would make the portfolio worth \$3.5 million.

Now back to reality. A 25 basis point investment in bitcoin would almost certainly be considered imprudent in the context of asset allocation and portfolio construction as practiced. It is an instrument that is as yet unproven and still developing in terms of technical, regulatory and market acceptance aspects. There is a very high chance that it will fail. Yet, it is considered prudent – and prudence is, by definition, what the majority is doing – to have hundreds or thousands of basis points of a portfolio invested in instruments that have negative yields (which is a different way of saying a virtually guaranteed loss). The majority also finds it prudent to include Venezuelan and Russian and Lebanese debt in a well-diversified portfolio, at yields below those of U.S. corporate bonds.

Is bitcoin really more dangerous than these other accepted instruments for use as a store of value? Is bitcoin really so dangerous that a portfolio could not survive a 25 basis point exposure? None of these questions are ever posed, since the debate is framed in the context of government or central bank action,

⁷ Source: www.gold.org



and the fate of the conventional slate of assets and instruments used in portfolio management are tied to those systemic factors.

The majority does not find it prudent to buy bitcoin. Bitcoin, with its \$16.1 billion market value⁸, is but a dust mote in the world of conventional investment assets. Here's how much of a mote: merely the four FANG stocks (Facebook, Amazon, Netflix and Google) are worth \$1.3 trillion, which is 80x the value of bitcoin. By the time the majority accepts bitcoin as a valid asset, should that come to pass, it will probably be too late to purchase it.

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⁸ As of December 31, 2016