

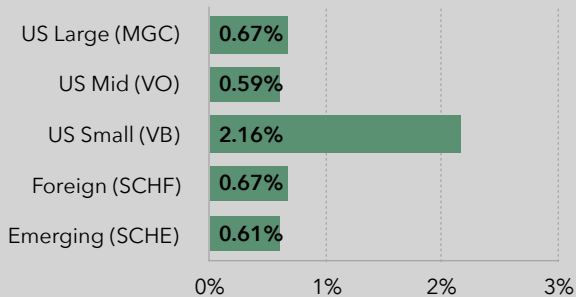
## June 2017

### Economic Data

- A strong 222,000 jobs were added in June, but the unemployment rate ticked up one-tenth to 4.4% and wage growth is still weak
- The housing market was back on track with existing home sales up 1.1% in May and new home sales up 2.9% over upwardly revised numbers from the previous month
- Year-over-year inflation (CPI) fell further yet to 1.9% in May, and the core rate (ex-food & energy) fell to 1.7%
- After a short-lived bump in April, retail sales resumed their slide falling 0.3% in May

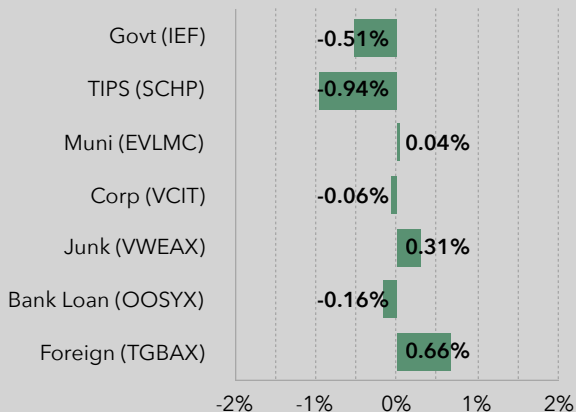
### Stocks

#### June Returns



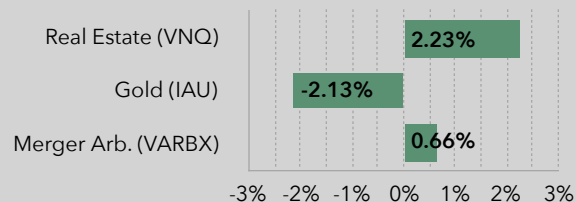
### Bonds

#### June Returns



### Alternatives

#### June Returns



Performance data provided by Morningstar.

The brain uses two systems to process information. The first type is intuitive but lazy, rapidly forming judgements with no conscious input. The second system is slow, reflective, and is not guided by emotions. It is that second system – type 2 – that we want in control of our investment portfolios.

### Will Bitcoins Work in the Zombie Apocalypse?

The answer is no, because bitcoin requires a functioning global network and a reliable power supply, and everything I've learned from zombie movies tells me those things won't be around long. To be fair, cash or credit cards wouldn't help you in this scenario either. But I have so many other questions. As you read this, keep in mind I am far from an expert on the topic. This is just a bit about my journey over the years to find what I believe are the correct answers.

#### What is bitcoin?

It is a "cryptocurrency" that works on a digital peer-to-peer network and doesn't exist in the physical world. At its core bitcoin was intended to be a tool for libertarian-minded people to conduct commerce outside of the realm of state control. There is a certain appeal to the libertarian angle of separating money from the state. In practice, however, it has also become the preferred medium of exchange for the illegal drug trade, human trafficking, and for getting paid on your ransomware attacks.

#### Who controls it?

No one person or organization. It was created by the enigmatic Satoshi Nakamoto, whose true identity is still unknown, but it functions as a decentralized platform controlled by the bitcoin community itself.

#### Man, how much money did that Nakamoto guy make?

He is estimated to have mined 1 million bitcoins in the currency's early days, which would be worth over \$2 billion today. It is spread out over a large number of different wallets, so it is hard to tell for sure.

#### Who has the fattest wallet then?

The FBI. They controls more than 144,000 bitcoins that reside at a bitcoin address that holds much of what was seized from Silk Road, the dark web black market mostly used for selling illegal drugs.

#### What is it backed by?

It is backed by neither physical good or government fiat. Only by the belief that somebody else will accept it as payment in the future.

#### Why has the price of bitcoin gone up so much?

Perhaps the most famous anecdote in bitcoin lore is of the first transaction ever made. In 2010, Laszlo Hanyecz, a programmer in Florida offered 10,000 bitcoins to anyone who would deliver him a pizza. Someone in the U.K. took him up on it and had two Papa John's pizzas delivered at a real world cost of \$25. This effectively established bitcoin value at 1/4 of a penny. Has Hanyecz foregone his desire for pizza, those bitcoins would be worth about \$23.6 million at today's price. Returns in the neighborhood of 1,000,000% are bound to capture the attention and imagination of others. I don't have any special knowledge about this, but "speculative frenzy" would be my best guess as to why bitcoin has gone up so much.

#### How does it work?

Bitcoins are stored on digital wallets. When payments are made between wallets, they are broadcast to the bitcoin network of computer nodes. Every ten minutes or so, bitcoin "miners" collect the transactions and combine them onto

## Bitcoin's Meteoric Rise



a “block”. Miners process the data and come to a consensus on what the new “blockchain” should look like, and disseminate the updated blockchain to the network. The blockchain is a global ledger that stores every transaction ever made in bitcoin.

### Wait, who are these miners?

As part of the mining process, computing power is used to solve a cryptographic puzzle. The miner with the solution earns the right to publish the new block and is paid a reward.

### So I can make a lot of money mining bitcoin?

Not really. In the early days, it was an uncrowded space which made it pretty easy for a hobbyist to mine a lot of bitcoins. But bitcoin has a theoretical limit of 21 million coins, and 78.3% of those and counting have already been mined. When bitcoin first launched, the block reward was 50 coins. But that number gets cut in half every 210,000 blocks, which has happened twice already putting the current reward at only 12.5 coins. Mining is also extremely crowded now and done mostly by large commercial outfits running massive farms of application-specific integrated circuits (ASIC) specifically tailored to mine bitcoins. According to an article in *Forbes*, “the entire bitcoin network is roughly 256 times faster than all the top 500 supercomputers around the globe combined.” And that was in 2013. What do you think the odds are that your laptop is going to beat that kind of computing power to the solution? Most individuals now join large mining pools and split the winnings if anyone from the pool solves the puzzle.

### Oh, so I can just join a pool and mine bitcoins for free?

No, mining is surprisingly expensive. First you need to buy the hardware, and even with more efficient ASIC systems your electricity bill will be much higher. At times the endeavor has actually been a money-losing proposition.

### How much electricity are we talking about here?

A tremendous amount of electricity is used for bitcoin mining, although nobody knows exactly how much. I've seen a number of different estimates reported over the past couple years, and the numbers tend to fall in the 250 to 500 megawatts (MW) range. A report by Motherboard last year put the number at 350 MW, enough electricity to power about 280,000 American homes. Put another way, it's almost as much as the output of a small nuclear power plant.

### Doesn't that seem like kind of a huge waste of electricity and computing power?

Yep.

### Can I just buy bitcoins?

I mean, I guess.

### Will people still mine once all the coins are out there?

Those with bitcoins will have a vested interest, but there is a moral hazard inherent here. Why should I pay the electric bill, when I can just sit back and let others maintain the integrity of the blockchain for me? That's where transaction fees come in, but that's still a relatively small portion of the miners' haul. The fee isn't fixed, but the higher the fee you pay, the higher priority your transaction has. Each block is capped at 1MB, and the average transaction takes around 250 bytes so there is a limit to how many transactions will be processed. If the fee is too low, your transaction could stall. Currently, there are about 22 MB, or 22 blocks worth of stalled transactions. The average transaction costs for bitcoin have run as high as \$5.24 in June, but have since come down and are currently at around \$2. That's still pretty steep when you can just pay with cash or a credit card for free.

### What if I just wanted to buy a cup of coffee with bitcoin?

First you need to find a coffee shop that accepts bitcoin, which I was unable to do here in Chicago. Even if there was, the transaction costs would likely be about as much as the coffee itself. Bottom line is you wouldn't want to use bitcoin for everyday transactions.

### Huh, so this really can't work as a global currency in its current form?

Nope. Every 10 minutes or so, the blockchain grows in size by as much as 1MB. The current blockchain is about 124GB. As the blockchain grows in size, the system becomes increasingly inefficient and the blocks are harder to process. There is a huge scaling problem with the blockchain. Bitcoin simply isn't set up to be an efficient large-scale payment system.

### Why don't they fix it?

Apparently there has been a sort of civil war going on in the bitcoin community for the past couple years. On one side you have the miners who want the ability to increase the block size to make it more scalable. On the other side are developers who want something called SegWit, which is short for Segregated Witness. SegWit is a change in the bitcoin protocol that essentially removes some of the fat (digital signatures; about 65% of the space) from the block so it can handle more transactions. As I understand it, starting July 21 bitcoin users will start signaling their readiness to switch to SegWit, and if 95% accept it within two weeks it will go active. If they don't, there will be a fork. It should make for good watching from the sidelines.

## Binge Box

### Patriot

No, not the Mel Gibson movie we all know and love. *Patriot* is a dark comedy on Amazon that follows John Tavner, a U.S. operative under a non-official cover as a piping engineer. The mission is “Money, Luxembourg, Iran, buy an election,” and that's basically it. But delivering something from point A to point B is never easy like that. Tavner is in the midst of a nervous breakdown, presumably brought on by having to detach himself from the brutality of his work. He copes with it by running red lights on his bicycle in the middle of the night and writing folk songs that detail his missions. What really makes the show, though, is the supporting cast that includes John Locke from *Lost*, Piper's brother from *Orange is the New Black*, and the dad from *That 70's Show*. Season 2 has already been given the green light.

### What's a fork?

Basically two bitcoins will exist: the new SegWit enabled one, and the old legacy bitcoin. I think. My head is starting to hurt.

### Will SegWit permanently solve the scalability problems?

No.

### What about regulatory risk?

Governments certainly hate competition, and controlling the money is the best game in town. There is a risk that major governments might try to regulate or even outlaw bitcoin under the guise that it increases the ease at which criminals can transact business and launder money. There is something of a precedent for this in the U.S. with the seizure of gold in 1933. There have also been measures taken by other governments to crack down on criminal trade in currency denominations of their own that are favored by the underworld, such as the phasing out of 500 euro note and the surprise demonetization of the 500 and 1,000 rupee notes in India.

### Is bitcoin secure?

The system is only secure if honest miners control the majority of the computing power. If any mining operation – or faction of operations – became a simple majority, they could alter the blockchain and double-spend their bitcoins. What was supposed to be a democratic system is now dominated by a handful of large-scale miners, with just four entities controlling more than 50% of the computing power. This is a legitimate security threat, but very unlikely. I believe the real risk would be takeover by a hostile government.

### Really?

As mentioned earlier, mining bitcoin is very energy-intensive. For this reason most large-scale mining operations are located in areas with cheap access to electricity, with the majority of mining done in China. China already imposes currency controls and made an attempt to crackdown on bitcoin earlier this year. So I don't consider it far-fetched to think they might try to seize all those mining assets one day in an attempt to undermine the integrity of the blockchain.

### So what do I ultimately think?

Bitcoin isn't really money yet because things aren't denominated in bitcoins. The price is far from stable, so it's not really a store-of-value. Buying bitcoin is pure speculation that someone will come along and buy it from you later at a higher price. I don't need bitcoin. It won't

Tactical Asset Allocation					
Asset Class	Heavy Under-weight	Under-weight	Neutral	Over-weight	Heavy Over-weight
<b>Cash</b>				●	
<b>Fixed Income</b>		●			
Core Domestic		●			
TIPS				●	
US High Yield	●				
Bank Loans				●	
Foreign Bonds			●		
<b>Equities</b>		●			
Large Cap		●			
Mid Cap		●			
Small Cap	●				
Developed Intl.		●			
Emerging			●		
<b>Alternatives</b>				●	
Real Estate		●			
Commodities					●
Hedging					●

make my life easier or better. I'm not writing this off as a fad, however. I think the whole idea of the blockchain is revolutionary. Bitcoin was just first, like MySpace. Something better is bound to come along. There are now over 900 cryptocurrencies out there, including Ethereum which could soon overtake bitcoin as the largest.

### What's Ethereum?

Ugh, I think we're done for now.

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## About EmeraldSpark

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