



TRADECRAFT
CAPITAL

TRADECRAFT INVESTMENT THESIS

Investing in a new technological revolution – *The Age of Autonomy*

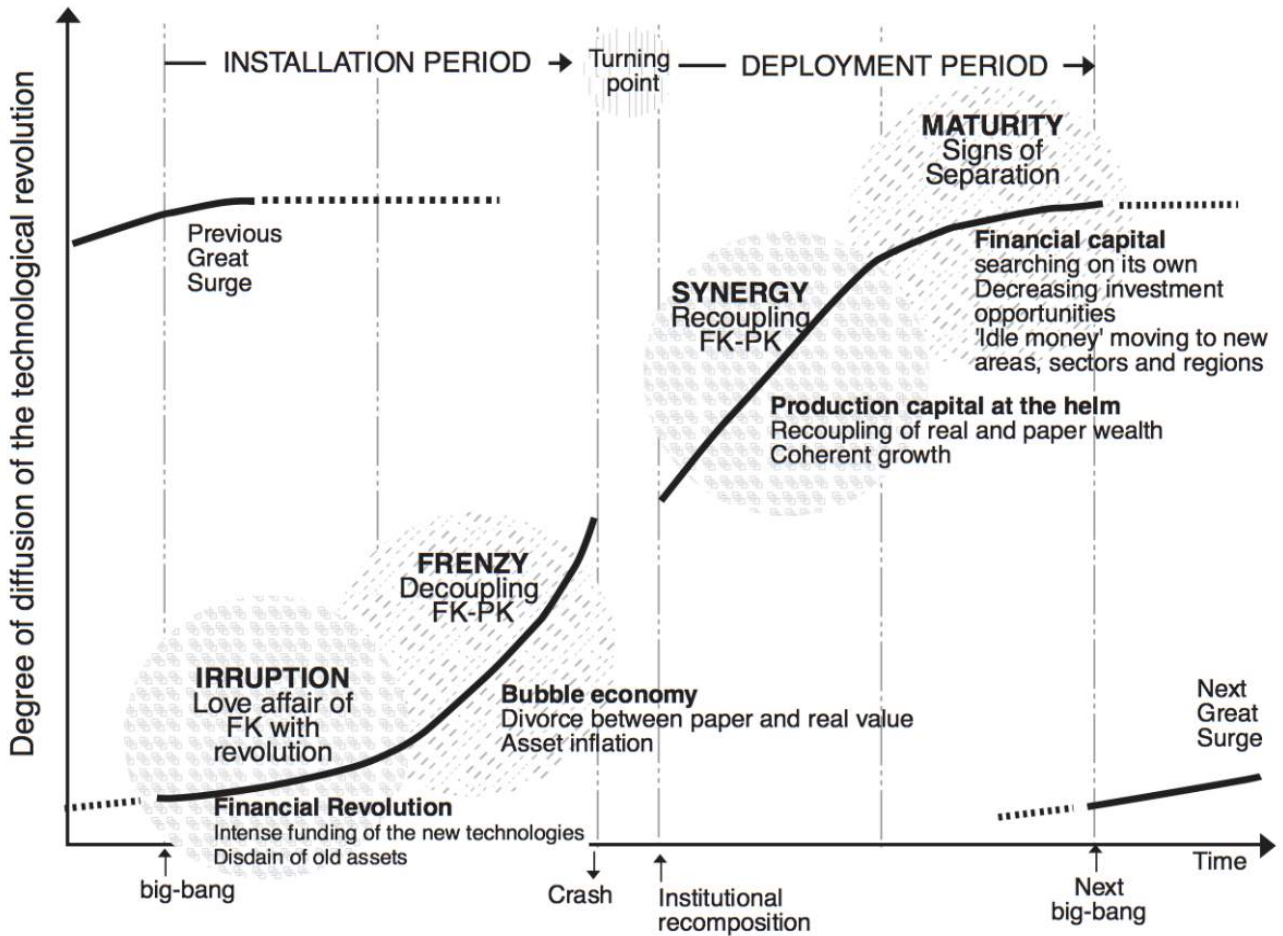
THE AGE OF AUTONOMY

Introduction

Artificial intelligence (AI), the Internet of Things (IoT), robotics and cryptocurrency are converging to deliver a new technological revolution. For the past 10 years AI, IoT and robotics have been delivering new solutions that drive automation. That has been valuable, but it has not been transformational. They have not created a paradigm shift in how businesses operate.

In this document, I will show why cryptocurrency is the mechanism that will unleash the wealth-building value of these technologies. It's cryptocurrency that allows for generating, processing, storing, and transferring value without the need of human intervention. I wrote about this concept originally in Hacker Noon, [Crypto's Role in the Age of Autonomy](#). As these technologies converge, they are bringing about what I call *The Age of Autonomy*. In the future, businesses without autonomous operations will not be able to compete with businesses that have them. It's competition that's a key driver to technology adoption. We saw this in the last cycle – offline businesses that didn't adapt could not compete with their digital competition (e.g. think Blockbuster or any print newspaper business). Once this technological innovation reaches a tipping point, businesses around the world will push to reconstitute themselves, once again, just like it did during the last technological revolution in the Age of Information (aka the Internet Age).

As we've learned from 100 years of evolving economic theory, credit drives the short-wave cycles, but technological revolutions drive the long-wave economic cycles. We are early in this new long-wave cycle, and as with past technological revolutions, extraordinary value is created in the early and middle phases of the cycle.



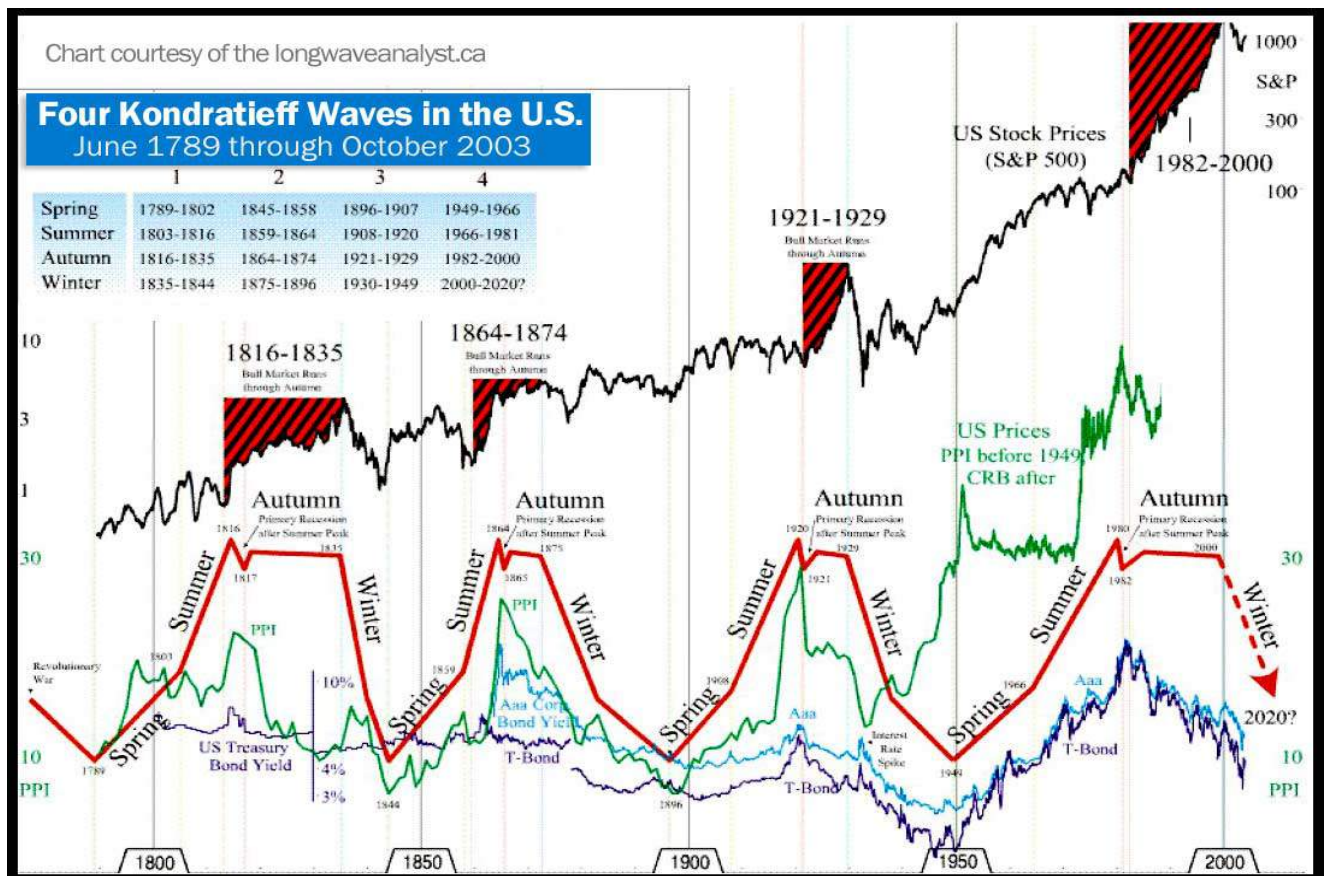
Note: From "Technological Revolutions and Financial Capital" by Perez

The duration of a long-wave economic cycle is typically 50-60 years. The cycle's duration is that long because of the amount of time it takes for new innovations to get adopted and distributed globally. Technological revolutions drive long-wave economic cycles and we are in an historic window for investment in this cycle. The best time to invest in a new technology is during the 2nd and 3rd phase, the Frenzy Phase and the Synergy Phase (above) where the technology has been proven in the Irruption phase, but the real adoption lies ahead in later in the cycle. I also believe we're in the 2nd phase of the cycle and about to see the Gilded Age where price decouples from value as we've seen in previous cycles in the crypto markets.

Since this is a global phenomenon, I'm expecting this wave to dwarf the market size of the whole dot-com bubble which was mainly a U.S.-centric event. The bubble created about \$9T in value before the bubble burst; I expect the crypto markets to well surpass \$10T before we're anywhere close to the "Turning Point" illustrated above, which is end of the Gilded Age and when the "bubble bursting" begins.

Long Wave Economic Cycles — 100 Years of Proven Economic Theory

[Nikolai Kondratiev](#) in the 1920's and later [Joseph Schumpeter](#) in the 1930's were among highly influential economists theorizing long-wave economic cycle theory during the 20th century. Kondratiev described these long wave cycles and constructed the boom and bust phases of the cycles. Schumpeter continued the work with his ideas around innovation-based economics and the term "creative destruction", which he coined. He named the long-wave cycle after his predecessor, Kondratiev.



Note: A chart of the Kondratieff Cycle showing cycles over the past 200 years

Much of their work came to the venture capital community by way of leading venture capital (VC) firm Andreessen Horowitz and other top VC's touting Carlota Perez's work, [*Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages.*](#)

In the book, she describes five technological revolutions of the past 200 years and continues building on the work of Kondratiev and Schumpeter by constructing a relationship between technology and the economy.

Table 1. Five successive technological revolutions, 1770s to 2000s

<i>Technological revolution</i>	<i>Popular name for the period</i>	<i>Core country or countries</i>	<i>Big-bang initiating the revolution</i>	<i>Year</i>
FIRST	The 'Industrial Revolution'	Britain	Arkwright's mill opens in Cromford	1771
SECOND	Age of Steam and Railways	Britain (spreading to Continent and USA)	Test of the 'Rocket' steam engine for the Liverpool -Manchester railway	1829
THIRD	Age of Steel, Electricity and Heavy Engineering	USA and Germany forging ahead and overtaking Britain	The Carnegie Bessemer steel plant opens in Pittsburgh, Pennsylvania	1875
FOURTH	Age of Oil, the Automobile and Mass Production	USA (with Germany at first vying for world leadership), later spreading to Europe	First Model -T comes out of the Ford plant in Detroit, Michigan	1908
FIFTH	Age of Information and Telecommunications	USA (spreading to Europe and Asia)	The Intel microprocessor is announced in Santa Clara, California	1971

The Push Towards Autonomy

With the advent of blockchain technology, we've begun a new long-wave economic cycle driven by a new technological revolution. Individuals, corporations and organizations are pushing for greater autonomy, agency and sovereignty. We're looking to AI for improvement in all sorts of systems from e-commerce to customer support to robotics. Investment is pouring into start-ups and initiatives that use robotics to minimize human intervention in rote physical tasks. I expect this revolution to reach the automobile in terms of autonomous driving which would revolutionize one of the biggest industrial sectors in the economy. We are looking at the greatest macro shift of our time and blockchain technology is going to take it one final transformational step further.

Even money itself is looking to become self-sovereign. Every time a government backed currency has come off a commodity or gold standard, it fails. We can look to Rome in the 3rd century, A.D. where the amount of silver went from 100% 100 years earlier to 0.02% at the end of the Roman Empire. We can look to John Law and France's failure of its state finance in the early 18th century, through a series of missteps, creating crippling inflation of 13,000 percent or we can look to the hyper-inflationary period of the Weimar Republic in the 1920's, which killed the German mark. Historically, fiat currencies fail as a store of value, always. Money gains its value by declaration and agreement, not by any intrinsic value. Money that can be secured, not manipulated, stored and transferred without the need of human intervention could be the most valuable money created to date.

Bitcoin was the first "killer app" of blockchain technology. Bitcoin brought forth something innovative by creating a global system to digitally transfer and store value. It does this through its design by using decentralization, immutability, and incentivization in novel ways that allow commerce transactions without the need of a trusted third party (i.e. like a bank). Moreover, the next generation of cryptocurrencies bring forth the capability of smart contracts (i.e. programmable money). These capabilities are new, and they will spark an entire wave of technological improvement centered around how we globally generate, store and transfer value. Competition, the drive for efficiency and continuous improvement ultimately push us towards autonomy. If a business can operate without the need for human intervention, it will minimize its operational cost. If Uber can remove the expense of a driver with an autonomous vehicle, it will provide its service cheaper than a competitor who can't. If an artificially-intelligent trading company can search, find and take advantage of some arbitrage opportunity, then it can profit where its competitors cannot. A business that can analyze and execute in real-time without needing to wait for a human to act, is a business that will be able to take advantage of brief inefficiencies from other markets or businesses. Autonomy is the ultimate competitive advantage.

The Age of Autonomy — What's Possible

This new Age is going to bring about transformational change. It will alter every aspect of how a business or organization will go about producing goods and services. Throughout the globe, each industry, community and government will begin building autonomous agents to produce work, generate value then transfer and store value.

These actions will be created and enforced by software — agents and bots implementing smart contracts through cryptocurrency platform networks. Robotics will achieve any movement in the physical world. The internet of things will provide the sensors and networks to measure and communicate data. Artificial intelligence will provide the judgement, expertise and evaluation within a closed system. And decentralized cryptocurrency platforms will provide movement across organizations via the smart contracts to govern and enforce the transfer and store of value from the work produced.

This will also restore balance between the individual and the group. Autonomous agents working in a decentralized world will allow people to invest and work on projects they're interested in and be paid or rewarded for their contribution. Earning tokens through work or investing in crypto assets you believe in

allow the benefit to be restored back to the individual. No longer will there be a rent-seeking intermediary like Facebook, Uber, Google or any other to extract value from the whole. Central organizations will no longer accumulate all the benefit. The power is restored to the individual because they will be able to vote within the “on-chain” governance systems without politics and without an intermediary circumventing the will of the collective individuals.

An Example of the Future Decentralized Autonomous Corporation

Let’s paint a picture of where the world is headed in the *Age of Autonomy*. We’ll use a co-op farmer in the Midwest. She’s got a sophisticated farming corporation and she knows where the world is headed. She has already bought precision agriculture products that have sensors all over the farm, robots tending to the crops and an Internet of Things network so all her robots, sensors, planting equipment and irrigation can all communicate.

The farmer also purchases a few new AI agent software modules that will help them turn all of the data they get from the crops’ IoT and sensors into knowledge. They’ve purchased some precision irrigation software and some specific weed management AI software for the robots.

She’s now just set up a decentralized autonomous corporation (DAC), which is a subset of a decentralized autonomous organization (DAO) superset. DAC’s are companies with board members and decision makers can help set goals, thresholds and parameters for the growing season ahead. Based on the trend this year and their planting history, they are going to plant a specific allocation of their farm to corn, soybeans, beets and wheat.

Under their new DAC, they set up a cryptocurrency account on an autonomous-contracts platform like Ethereum or Tezos. The DAC writes some custom autonomous contracts that will act on behalf of the DAC if certain conditions or events are triggered without the need of human intervention. They have set their plans, goals, actions and counter-actions. They are ready for the season. The pre-season activities begin. One of the “buying contracts” notices a 4% better deal for corn seeds from China, so it purchases the seeds with its cryptocurrency account and send the request to the seed company.

During the season, the weather AI agent notices a forecast that’s going to produce serious flooding in the beets field, so the AI communicates with the irrigation equipment to stop watering the field until one of the soil sensors measures the correct water threshold. The AI triggers an event on the autonomous-contracts platform. The DAC has a “risk management” autonomous contract which exists to help manage the grower’s financial risk throughout the season. If this flooding occurs, it produces some serious financial risk to the farm, so it looks on the commodities futures exchange to see what price they could get if they sold some corn and beet futures. This will lock in a certain price for a percentage of the crops which helps them mitigate financial risk. All of this is happening without the need of human intervention. This is what the world will look like in the *Age of Autonomy*.

Conclusion

The *Autonomous Revolution* has begun. Artificial intelligence, the Internet of Things, robotics and cryptocurrency are converging to deliver a new long-wave economic cycle. Understanding the long-wave economic cycle and what is the key technological innovation will make you a better investor. If you could have been early in the Age of Information investing in Internet infrastructure, you would have delivered superior returns as an investor. Understanding the technological revolution and where we're at in the cycle would have kept your investment "true north". Likewise, this new long-wave cycle will be about autonomous operations. By reducing operational cost and increasing potential leverageable opportunities, autonomy is the ultimate competitive advantage. Business founders and investors who focus their strategy on building autonomous infrastructure will reap the rewards. Those that don't will be left behind.