

CRYPTO VS. DOT-COM: A COMPARISON OF MARKET CRASHES

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Virtually every major technology has an initial spike of interest, then a dip, and then a long-term rise to success. The dot-com bubble is the canonical example...
- Balaji Srinivasan (entrepreneur and investor)

Bitcoin is a remarkable cryptographic achievement... The ability to create something which is not duplicable in the digital world has enormous value... Lot's of people will build businesses on top of that.
- Eric Schmidt (former CEO of Google).

The sense of responsibility in the financial community, for the community as a whole, is not small. It is nearly nil.
- John Kenneth Galbraith

Abstract.

The dot-com crash (2000-2002) resulted in a significant decline of technology stocks. A similar scenario was seen in the cryptocurrency market in 2022, as the value of digital assets experienced a sharp drop. Both market corrections share some similarities, such as the excitement surrounding new technologies and their potential impact on the global economy. However, the causes of these crashes are quite distinct. The dot-com crash was the result of multiple factors, including the overvaluation of tech stocks, lack of profitability among dot-com firms, and the general economic downturn. On the other hand, the cryptocurrency crash was mainly due to the rapid increase in crypto values, followed by a sudden drop, made worse by bankruptcies and allegations of mismanagement and fraud. The recovery process from both crashes was also different. After the dot-com crash, there was a lengthy period of consolidation and eventual rebound, while the crypto crash led to a shake-out in the market, leaving an uncertain future for the recovery of most cryptocurrencies. Despite the uncertain future of cryptocurrencies, they have already had a significant impact on the financial world. Most crypto projects will fade away, but established cryptocurrencies such as Bitcoin and Ethereum are expected to survive.

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The dot-com crash of 2000-2002.

The dot-com bubble burst of 2002, was a period of excessive speculation and overvaluation of internet-based companies that came to a head in March 2000. This period was characterized by a significant decrease in the value of many technology stocks, as well as a decline in the overall stock market.

The dot-com boom of the late 1990s was driven by a belief that the internet would revolutionize the way we live and work. Investors were eager to get in on the action, pouring money into internet-based companies with little or no revenue or profits. These companies were often referred to as "dot-coms," a term used to describe businesses that were primarily based on the internet.

The dot-com boom was fueled by a combination of factors, including advancements in technology, the rapid expansion of the internet, and a general sense of optimism about the future. Many investors believed that the internet would be a "game changer" and were willing to invest in companies that promised to be part of this revolution. In addition, interest rates in the late 1990s were relatively low, which made debt financing easier for young, ambitious tech companies, further stimulating the internet industry's rampant growth.

However, this optimism* was not based on solid fundamentals. Fundamentals include the basic quantitative & qualitative information that contributes to the financial or economic well-being of a business. These would include, among others, profitability, revenue, assets, liabilities, and growth potential. Many of the dot-coms had no clear business models and no revenue, let alone profits. Their values were almost exclusively based on their potential rather than their actual performance.

As a result, many of these companies were flagrantly overvalued, and their stock prices were not supported by their underlying fundamentals. For example by 1999, the price-to-earnings (P/E) ratio of the NASDAQ Composite Index had surpassed 90. Several dot-coms had P/E ratios well over 200. To put it another way, given a company's current earnings, it would take more than 200 years of accumulated earnings to equal the cost of the investment. Many investors chose to ignore that fact – at their peril.

The dot-com crash began in March 2000, when the NASDAQ, the stock market that was home to many of the dot-coms, peaked at 5,048.62. From

* Then Federal Reserve chairman Alan Greenspan used the term "irrational exuberance" to describe this optimism during the dot-com bubble. The phrase was interpreted as a warning that the stock market might be overvalued.

there, it began a steady decline, eventually losing nearly 80% of its value by October 2002 (see Figure 1 below).

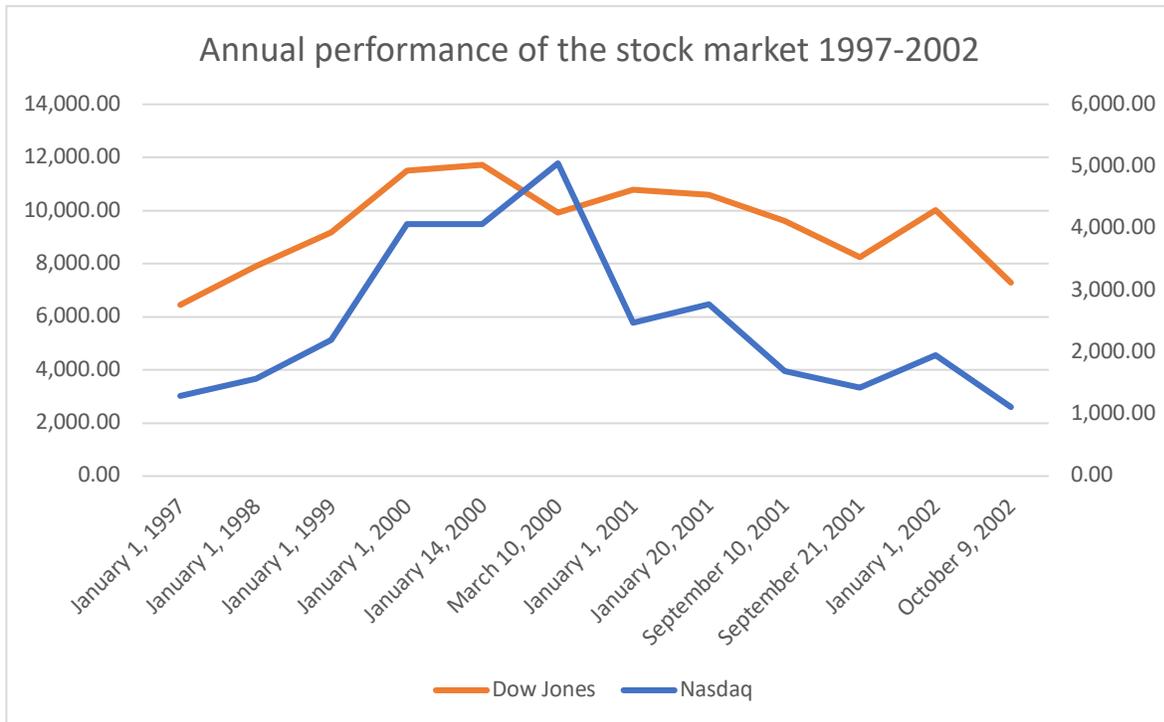


Fig.1 The rise and fall of the NASDAQ and S&P500 1997-2002.
Source: Yahoo Finance

The crash was caused by a combination of factors, including the bursting of the dot-com bubble (the exuberance proved to irrational, indeed!), a recession, the 9/11 (2001) attacks, and a decline in consumer spending. But mostly, as investors began to realize that many of the dot-coms were not going to be profitable, they began to sell their stocks en masse, causing prices to plummet.

The dot-com crash had a significant impact on the economy, as many of the dot-coms went bankrupt and thousands of people lost their jobs. The crash also had a psychological impact, as investors became much more cautious and less willing to invest in technology stocks.

The dot-com crash of 2002 serves as a reminder of the dangers of speculation and overvaluation. It also highlights the importance of investing based on solid fundamentals and not just on vague potential, or hype.

Despite the dot-com meltdown, the internet has continued to revolutionize the way we live and work, and the few dot-coms that survived the crash have gone on to become successful companies as, for example Amazon,

eBay, Google, and Cisco. Here are a few reasons why: Although it had not yet turned a profit, Amazon's strong focus on market share, customer service and its diversified business model helped it weather the crash. eBay the online marketplace had a strong and loyal user base, which helped it to continue to grow, even during the downturn. Google had a solid business model, fast growing market share, and a strong focus on technology and innovation, to become one of the most successful global companies. Cisco had a strong hold on the enterprise networking market and a solid financial position, which helped it to survive the melt down.

The dot-com crash of 2002 was a significant event in the history of the economy and the stock market. Just 48% of internet companies just barely survived the dot-com crash, and it took Amazon a decade to regain its previous peak share price. It serves as a reminder of the importance of humility, caution and due diligence and the dangers of speculation and overvaluation. It highlights the importance of investing based on solid fundamentals, like positive earnings and cash flows. As Warren Buffett so aptly put it: "It's only when the tide goes out that you learn who's been swimming naked". Indeed in 2002, it became painfully clear that the emperor (i.e. many dot-coms) had no clothes. It took several years for tech stocks to attract investors again.

While the crash had a negative impact on the economy, the stock market, and many individuals, the "survivors" paved the way for the continued growth and development of the internet (see Fig. 2 below).

Individuals using the Internet

Source: ITU

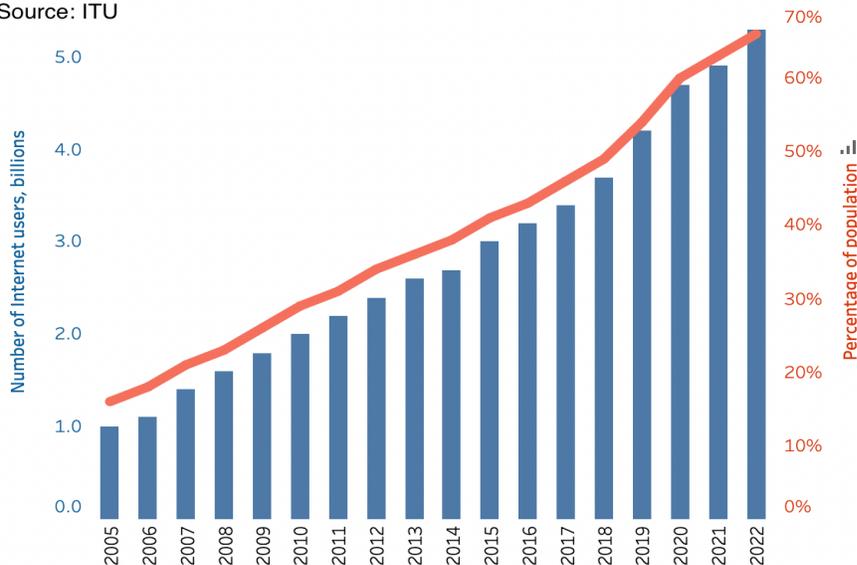


Fig. 2 Growth in the worldwide use of the Internet 2005-2022
Source: International Telecommunication Union (ITU)

The Crypto Crash of 2022.

The rise of cryptocurrencies, such as Bitcoin, has been one of the most significant developments in the financial world in recent years.

Cryptocurrencies are digital or virtual currencies that use cryptography for security and operate independently of a central bank. Since the launch of Bitcoin in 2009, the world of cryptocurrencies has grown exponentially, with thousands of different coins and tokens.

One of the main drivers behind the rise of cryptocurrencies has been the increasing dissatisfaction with traditional financial systems. The 2008 global financial crisis, which was triggered by the collapse of the housing market, led to widespread distrust in banks and governments. This, coupled with the rise of the internet and the increasing accessibility of technology, has created an environment in which alternative (decentralized) financial systems can flourish. Cryptocurrencies, with their decentralized and secure nature, have provided a viable alternative to traditional financial systems, which are often seen as slow, inefficient, and corrupt.

Another key factor in the rise of cryptocurrencies has been the emergence of blockchain technology. Blockchain is a digital ledger of transactions that is stored across a network of computers, rather than in a central location. It is the technology that underpins cryptocurrencies and enables them to operate in a decentralized manner. The transparency and immutability of blockchain technology provide a level of security and trust that is not present in traditional financial systems. Furthermore, blockchain technology has the potential to revolutionize many industries beyond finance, including smart contracts, supply chain management, audits, real estate, and healthcare, among others (the list growing).

Perhaps the most well-known cryptocurrency is Bitcoin. Bitcoin was created in 2009 by an unknown person or group of people using the pseudonym "Satoshi Nakamoto". The concept behind Bitcoin was to create a decentralized digital currency that could be sent electronically from one person to another without the need for a middleman, such as a bank. Since its launch, Bitcoin's value has fluctuated significantly, reaching an all-time high of almost \$64,000 in April 2021. There's an expression crypto enthusiasts use, in the hope a particular digital currency's value will blast off: "To the moon!"

Other cryptocurrencies have also gained popularity in recent years. For example, Ethereum is a blockchain-based platform that enables the creation

of decentralized applications and smart contracts. Litecoin is a peer-to-peer cryptocurrency that is based on Bitcoin's code but with some technical differences. Ripple is a digital currency that is designed for use in the international money transfer market. These are just a few examples of the thousands of different cryptocurrencies that are now available, each with their own unique features and uses.

While the rise of cryptocurrencies has been significant, it has also been met with a great deal of skepticism and criticism. For example, a currency must have four attributes: a unit of account, a means of payment, a stable store of value, and act as a single numeraire.

Cryptocurrencies have none of these features. Not much is priced in crypto; it is not a scalable means of payment; it is not a stable store of value given its high volatility; and the prices of different items are not denominated in cryptocurrencies. Most importantly, cryptocurrencies have simply been too volatile and therefore not (yet) suitable as a store of value, or a means of payment. Nobody wants to hold such a capricious asset, or get paid in a currency whose value is considerably less the next day.

Additionally, many have raised concerns about the potential for illegal activities, such as money laundering and fraud, to be conducted using cryptocurrencies. For example, perpetrators of ransomware attacks typically demand payment in crypto.

Furthermore, there is a lack of regulation and oversight in the digital asset market, which has led to numerous scams and frauds.

Despite these challenges, there is a cautious trend towards the adoption of cryptocurrencies. Several governments and financial institutions are now exploring ways to integrate blockchain technology and digital currencies into their systems. The latter takes the form of so-called CBDC's (Central Bank Digital Currencies). A CBDC is a type of digital currency issued and backed by a country's central bank, designed to function as a medium of exchange and store of value like traditional fiat currencies. CBDCs aim to offer a digital alternative to physical cash and offer increased efficiency, faster and cheaper transactions, and improved financial inclusion.

According to the Atlantic Council's CBDC Tracker, 114 countries, or over 95% of global GDP, are exploring a CBDC. Eleven countries have already fully launched a digital currency and in 2023, over 20 countries will take significant steps towards piloting a CBDC, according to the Council (<https://www.atlanticcouncil.org/cbdctracker/>).

In addition, retailers and other businesses in several countries have begun accepting cryptocurrencies (especially Bitcoin) as a form of payment.

Crypto Adoption Index 2022	
Country	Ranking
Vietnam	1
Philippines	2
Ukraine	3
India	4
United States	5

Table 1. Top-5 per Capita Crypto Adoption Index. 2022

Source: Chainanalysis. <https://blog.chainanalysis.com/reports/2022-global-crypto-adoption-index/>

Table 1 (above), shows the Top 5 per Capita Crypto Adoption Index for 2022. According to Chainanalysis, global adoption of cryptocurrency reached its current all-time high in Q2 2021. Since then, adoption has moved in waves – it fell in Q3, which saw crypto price declines, rebounded in Q4 when we saw prices rebound to new all-time highs, and has fallen in each of the last two quarters as we’ve entered a bear market.

It could be argued that the rise of cryptocurrencies, led by Bitcoin, has been a potentially transformative development in the financial world. The decentralized and more secure nature of cryptocurrencies, combined with the emergence of blockchain technology, has provided a likely viable alternative to traditional finance. The increased dissatisfaction with conventional financial systems and the accessibility of technology have created a positive environment for cryptocurrencies in general and Bitcoin in particular.

Several cryptocurrencies did indeed go “to the moon” in early 2022, when enthusiasm was at its peak. However, a few months later it all came crashing back down to Earth. What happened?

The crypto industry reached “peak hype” in January/February 2022, primarily because of “peak” marketing. Especially in the U.S. ads were everywhere, on billboards, on TV. Celebrity endorsements also played a significant role, as well as an explosion of YouTube channels featuring “crypto gurus”, often with questionable reputations. This was the way to get rich, very rich very quickly. FOMO (Fear Of Missing Out) was also at a peak.

Then inflation raised its head and the Federal Reserve started to raise interest rates. Crypto currencies were sometimes referred to as “digital gold” and, like gold, were thought to be an effective hedge against inflation. Prices of e.g. Bitcoin were expected to rise during periods of high inflation, but they did not. Instead, they went down – considerably. Bitcoin went from a peak of \$68,000 to a low of \$17,000; Ethereum from an all-time high of \$4,600 to a low of \$1,068.

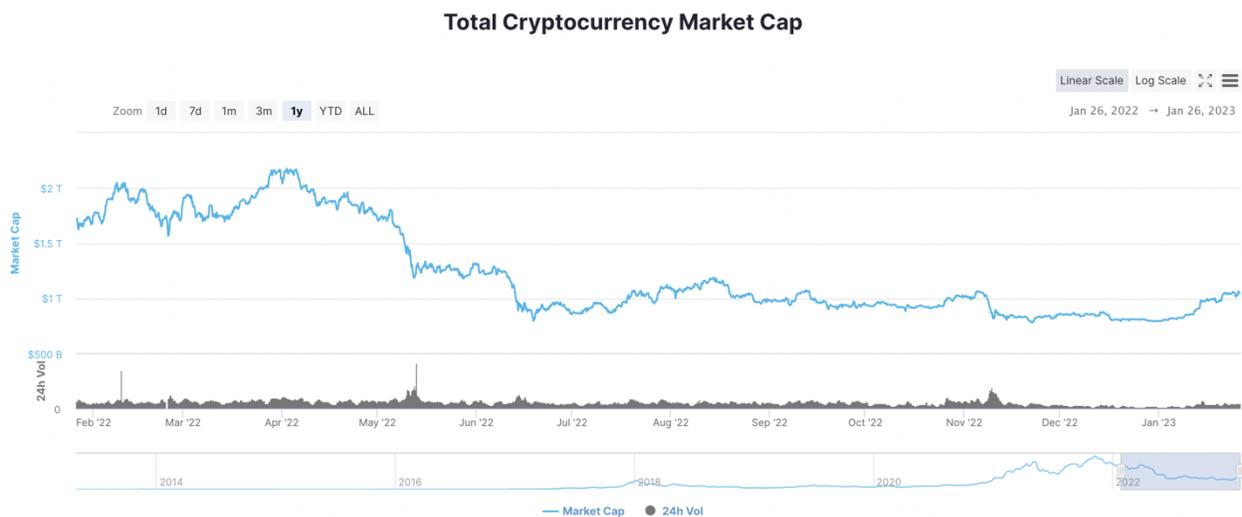


Fig.3: Total market cap of all cryptoassets, including stablecoins and tokens. January 2022 – January 2023.

Source: <https://coinmarketcap.com/charts/>

As Figure 3 (above) shows the total market capitalization of all crypto assets decreased significantly in 2022. From \$2 Trillion on March 29 to \$800 Billion on November 10.*

* An interesting “aside”, as of this writing (January, 2023) the market cap of a single technology company (Apple) is twice the total market cap of all crypto assets combined: AAPL = 2.3 Trillion; Crypto = 1 Trillion.

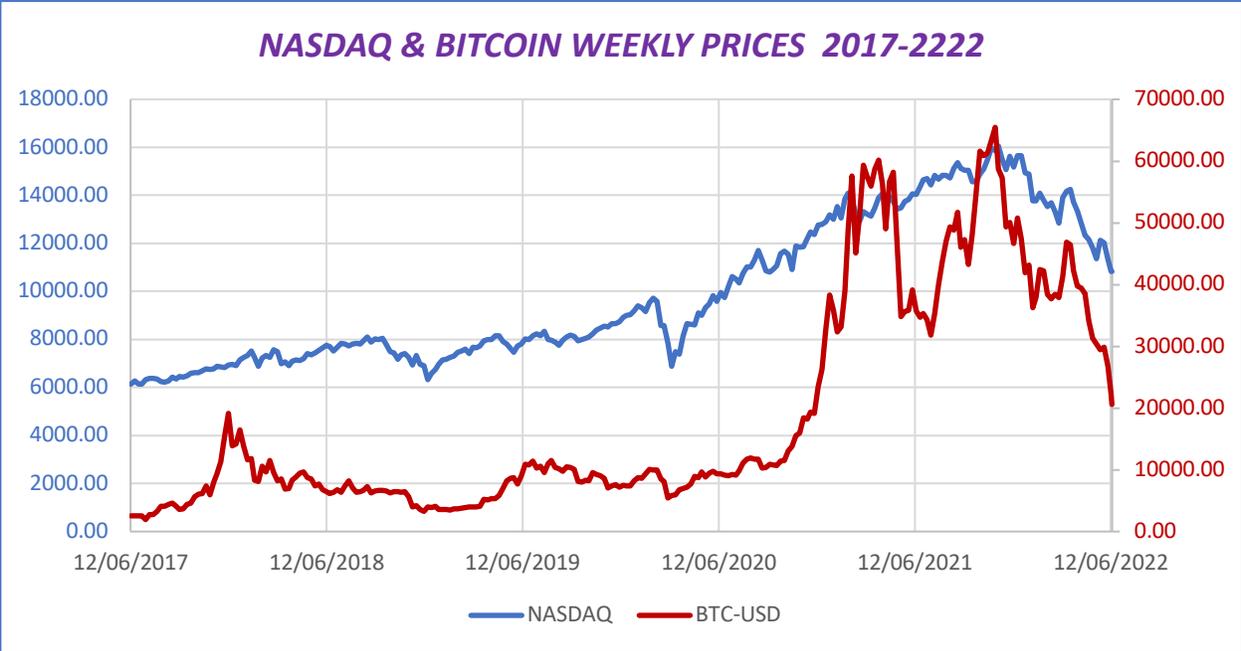


Fig. 4. Weekly Prices of the NASDAQ 100 Index and Bitcoin (in USD).
Source: Yahoo Finance.

Figure 4 (above) shows that since the COVID-19 crisis of 2020, Bitcoin (BTC) has shown a tendency to move in the same direction as the Nasdaq 100 index. The Nasdaq-100 lists the largest domestic and international non-financial companies - especially in the technology sector, including Apple, Google, Microsoft, ASML, and Zoom. Regression and Correlation statistics are shown in Table 2 below.

Regression Statistics		Correlation Matrix	
Multiple R	0.910401978	NASDAQ	BTC-USD
R Square	0.828831761	NASDAQ	1
Adjusted R Square	0.828175944	BTC-USD	0.910402
Standard Error	7288.097685		1
Observations	263		

Table 2. Regression and Correlation Statistics between the NASDAQ 100 Index and Bitcoin (all in US\$).

These precipitous declines began to expose a number of structural weaknesses in the crypto industry. Many crypto firms were overextended, had poor risk management, and some engaged in fraudulent activities (e.g. inappropriate use of clients' money).

Crypto lending firms fared no better. They attempted to act as the cryptocurrency equivalent of a bank (without any of the established banking regulations), promising lucrative returns to customers who deposited their bitcoin or other digital assets. Because of the crypto asset melt-down much of the underlying collateral these firms were holding became worth less than the loans they had issued, effectively making several of these "crypto banks" insolvent. As a result, they have either filed for bankruptcy protection, or gone out of business.

The malaise extended to Cryptocurrency Hedge Funds. In June 2022, crypto hedge fund Three Arrows Capital (3AC) was ordered to liquidate after defaulting on a \$2.4 billion loan (from crypto "bank" Genesis Global Capital).

The recent bankruptcies of FTX, Voyager, Celcius, Genesis, BlockFi, 3AC, and others have shown how deeply interconnected these entities are, resulting in serious ripple effects, with a number of trading platforms unable to exchange crypto for fiat, i.e. investors were unable to get their money back. It turned out that these crypto firms were totally unprepared for the big waves of panic-driven withdrawals.

As companies and individuals started to suffer large losses, financial regulators started to get involved. It was generally felt that there is clearly an urgent need for an effective & consistent regulatory policy and supervision of the crypto markets - on a global level.

*PwC Crypto Regulation 2023 Report*** examines the ongoing regulatory developments in over 25 jurisdictions. "The report shows that many regulators across the globe have either enacted regulatory schemes for dealing in digital assets ,or are on the brink of doing so. And given the recent events in the sector, the speed of these developments is likely to intensify."

Steep declines in crypto asset values, crypto firm failures, fraud, scams and mismanagement have caused considerable damage to the reputation of all things crypto.

The crypto narrative has become extremely negative, with many voices proclaiming that cryptocurrency is just a giant Ponzi scheme; a trend based on the "greater fool theory." It will take considerable time and effort to get the people's trust back. Coherent regulation, along with serious

** <https://www.pwc.com/gx/en/about/new-ventures/global-crypto-regulation-report-2023.html>

improvements to a crypto firm's risk management capabilities & procedures, would be a good starting point.

2002 vs.2022

The dot-com crash of 2000-2002 and the cryptocurrency crash of 2022 are both examples of market corrections in which the value of certain assets, in these cases technology stocks and cryptocurrencies respectively, experienced significant declines. However, there are also some key differences between the two events.

At first, it looks as if the crypto meltdown of 2022 is reminiscent of the dot-com bubble burst of 2000. Indeed, in the period between 1995-2000 technology firms grew exponentially, amid a new technology (the Internet) which held much promise. The Internet would revolutionize the way companies do business: The global marketplace would instantly be more accessible, connected, inclusive, and diverse. The Internet would facilitate business development, communication, and collaboration.

Cryptocurrencies and the blockchain were also new technologies with equally high expectations for the future. With the promise of easy, relatively secure, payment transactions without a central authority, or single processor, the technology was believed to be a game changer. Anyone with a smart phone and a crypto wallet could participate!

Like the crypto craze, the dot-com boom was sparked by excitement about a new technology and its potential impact on the global economy. But there, in my opinion, the similarities end. One of the main differences is the cause of the crashes. The dot-com crash was caused by a combination of factors, including overvaluation of technology stocks, a lack of profitability among dot-com companies, and a general economic downturn. The cryptocurrency crash of 2022, on the other hand, was mainly caused by a rapid increase in the value of cryptocurrencies followed by a sudden drop, as well as the actions of regulatory authorities, bankruptcies, and scams.

Another difference is the scope of the crashes. The dot-com crash affected a wide range of technology stocks, including those of well-established companies, as well as startups. The cryptocurrency crash of 2022 was more contained and limited in scope. For example, at the macro level the crypto crash of 2022 is a less isolated phenomenon: It coincides with a global economic slowdown triggered by inflation, rising interest rates, the lingering COVID-19 pandemic, supply chain chaos, and a war in Europe.

However, in some ways it is also more isolated at the micro level, with far fewer households holding crypto now than had tech stocks in their portfolios during the dot-com boom. Despite recent warnings about crypto's potential to create international "financial stability risks," it is expected to have a limited impact on the global financial system.

Let us consider a few specific figures. In 2000, the dot-com sector peaked at \$2.95 trillion. Accounting for inflation, that would be \$4.95 trillion. It then sunk to a low of \$1.2 trillion. Accounting for inflation, that would be \$3.2 trillion. The total market cap of crypto reached \$2.8 trillion at its peak. Accounting for inflation, that would be \$1.7 trillion in 2002. It is now at a low of \$1.23 trillion. Accounting for inflation, that would be \$73 billion in 2000. The change between the peak of the dot-com bubble is 59.5% from high to low. The change between the peak of the current crypto bubble is 56% from high to low. Inflation will skew these figures slightly.

Finally, the recovery from the two crashes also differed. The dot-com crash was followed by a period of consolidation, with many companies going out of business (Pets, Webvan, eToys), or being acquired (AltaVista, Broadcast, DoubleClick). The technology sector eventually rebounded, and many companies that survived the crash went on to become highly successful businesses. On the other hand, the cryptocurrency crash of 2022 led to a significant shake-out in the market, with many coins and tokens losing a large amount of their value. As of today (January 2023) the market for cryptocurrencies has yet to fully recover.

The year 2023, may be regarded as a possible turning point for crypto assets, where they are either marginal products to be approached with skepticism and caution. Or, it may be regarded as a period of growing pains for an industry still in its infancy. The future of cryptocurrencies is uncertain, but it is clear that they have already had an impact on the financial world and may continue to do so.

Conclusion.

The dot-com bubble was the result of excessive speculation of Internet-related companies. An unprecedented amount of individual investing, pushed the Nasdaq Composite Index to an all-time high in March, 2000. By October 2002, stocks had declined in value by more than 75%. Through reorganization and redefined business plans a few companies managed to adapt, survive and thrive.

A similar scenario is possible for the crypto space. Most crypto projects will simply cease to exist. (perhaps as high as 98%!) But more established and

accepted cryptos, like Bitcoin and Ethereum, are the most likely to survive in the long run. Bitcoin may endure because it has strong name recognition and maintains considerable support, also from within the financial system. Ethereum is a decentralized, open-source blockchain with, among other things, smart contract functionality. Ether, its native cryptocurrency, is second only to Bitcoin in market capitalization.

As for pricing, it would not be unreasonable to assume that Bitcoin would fall below \$10k. But surprisingly, it never even came close (\$15,600 was the latest all-time low) and has since rebounded somewhat. This resilience is worth noting, as Bitcoin is still far away from being a store of value, or an inflation hedge, or a widely accepted payment system. The most bullish quality about Bitcoin may be the fact that it simply won't go away.

Internet technology never went away either and has, in fact, enjoyed spectacular growth over the past 20 years. Similarly, you cannot "undo" blockchain technology. Despite the recent setbacks, there is great hope for crypto – especially among the younger generation. For them, (to paraphrase Winston Churchill) it is not the beginning of the end, but the end of the beginning - in terms of technological capability and adoption.
