

Reasons to Be Bullish About the Digital Future

[Click here to view as PDF.](#)

“Our intuition about the future is linear. But the reality of information technology is exponential, and that makes a profound difference. If I take 30 steps linearly, I get to 30. If I take 30 steps exponentially, I get to a billion.”

-RAY KURZWEIL

In this week's EVA, we are putting aside our concerns about excessive debt levels, reckless central bank policies, inflated asset prices, and widespread investor complacency to focus on the long-term promise offered by America's technology sector. As you will read, there is a lot to be excited about over the next five to ten years and, in some cases, the future is now.

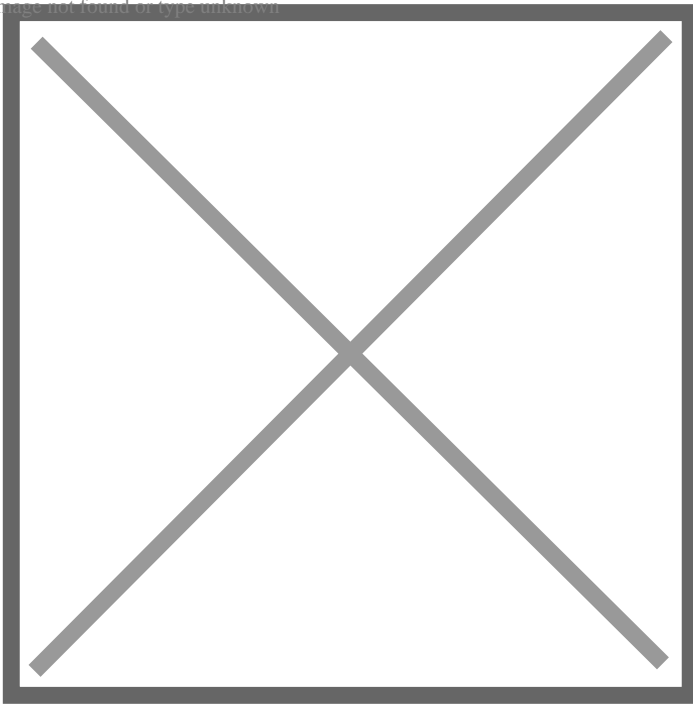
We are in the middle innings of an economic boom, in my perhaps not humble enough opinion.

Recently, I've read market commentary claiming that we are experiencing 1999 all over again. However, I'm betting those skeptics will find themselves mistaken about a tech bubble. The infamous Dot-com bubble was formed on hype due to companies with nothing more than a business plan created in PowerPoint, fetching stupid valuations. Today, the rate of technological progress isn't hype, it's real. Now, are there still companies out there trading for stupid valuations? Yes. And will some tech trends fade away? Of course. However, I believe there are momentous technological advances underway that are going to reshape the global economy as we know it.

There will be some very big winners and some very big losers, but the most intriguing aspect of this new frontier has been—and will continue to be—the pace at which these changes take place. Mere decades ago, building a \$1 billion enterprise required access to staggering levels of human and financial capital, as well as time. In contrast, the social media company Instagram took only 24 months and two rounds of venture funding (~\$20 million total) to build an enterprise that would be sold to Facebook for \$1 billion 18 months later. Technology has turned capitalism on its head. The need for intellectual capital has largely replaced the need for financial capital.

In this EVA, I will discuss technologies predicted to have profound impacts on the trajectory of the global economy—and I believe they are coming far faster than most investors are anticipating. Some of these technologies are just emerging, while others are well underway. This is not meant to be a comprehensive list of every potential technological break-through that lay ahead. But, hopefully, it will get readers thinking about how vast the possibilities are for technology to help fuel structurally higher economic growth for the foreseeable future.

Image not found or type unknown



Augmented Reality (AR)

Definition: Augmented Reality (AR) is an enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device.

If this doesn't paint a clear picture for you, I have a few basic ways of explaining it.

AR and Sports:

When you watch football on TV and see the yellow line indicating a first down, the marker is superimposed on your TV but not visible to the fans at the stadium. This is an AR experience.

If you're a golfer, you've likely used a rangefinder (for non-golfers: a rangefinder is a small camera-shaped device that works a bit like binoculars). When looking through the device, golfers will see yardage displayed indicating how far they are from the target they shot. This happens dozens of times per round and is a clunky form of AR as you need to pull out the device every time a measurement is required. While it certainly beats the old way of looking for a distance marker, there is clearly still room for improvement. I anticipate that golfers will soon know distance, changes in elevation, and possibly wind direction without ever lifting a finger, through sunglasses that display the information digitally. For those thinking I have a wild imagination, consider that Oakley has already brought to market ski goggles with a built-in digital display that shows altitude, distance traveled, and temperature.

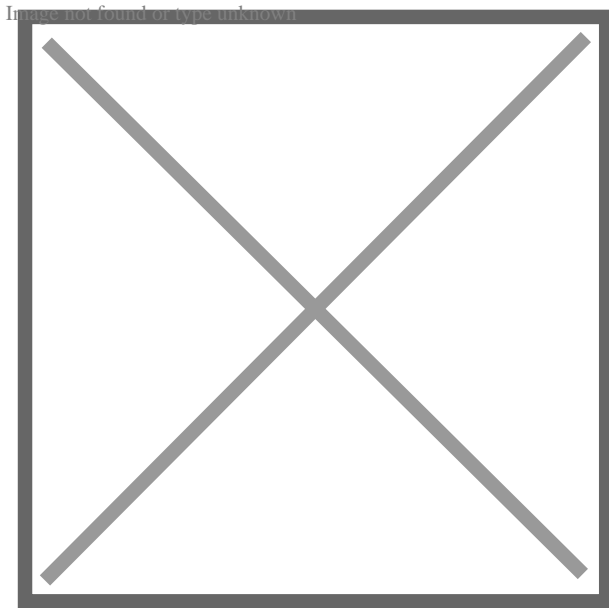
AR and Travel:

If you're uninspired by the sports application of AR, consider being a tourist in a foreign country. You pop on some stylish smart glasses. As you stroll down unfamiliar streets, signs are translated into a language of your choosing. Virtual signs pop up as you walk past restaurants, allowing you to browse the menu, view each item in 3-D, read reviews, and see photos, all without ever physically entering the restaurant.

AR and Healthcare:

In the field of healthcare, augmented reality is already making an impact. The *Harvard Business Review* recently wrote an article on the topic: [“How Augmented Reality Will Make Surgery Safer.”](#) In it, they make a fascinating point: “...while imaging has radically evolved, how images are displayed is basically the same as it was in 1950. Visual data are always shown on a 2D flat screen, on displays that force health care providers to look away from the patient, and even away from their own hands while operating.”

Another medical application comes from a company called Accuvein, which has created a vein mapping technology to aid with IV placement. The company states that 40% of IVs miss on the first attempt at finding a vein, so they invented a scanner that projects over skin and shows nurses and doctors where various veins, valves, and bifurcations are in a patient’s body. This has been used on more than 10 million patients so far and made finding a vein on the first attempt 3.5 times more likely.



Electric Vertical Takeoff and Landing (ETVOL)

Definition: Drones that can carry people.

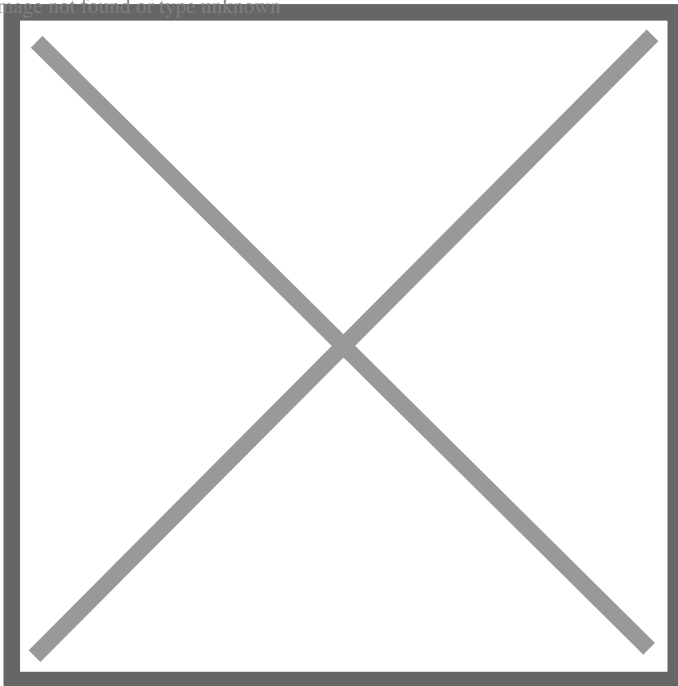
Remember The Jetsons? For our younger readers: The Jetsons was a popular futuristic cartoon where people lived in a city in the sky and would zip around in flying cars. I think many readers will dismiss flying cars as a mode of transportation their kids may see, but certainly a far-off reality for their own travel horizons. However, some companies are much further along than you may think. Larry Page, a founder of Google, has invested significant time and money into a company called “KittyHawk”. They are building commercial drones that would serve as taxis for humans. (Read more [here](#).) It’s currently being manufactured and tested in New Zealand. Just like the small drones you see amateur hobbyists fly, the KittyHawk will take off vertically. It will have multiple rotors and it will fly passengers from point A to point B. In most designs, there’s no pilot. Some of the drones are being designed with a failsafe parachute in the event of an emergency. The current technology allows for travel at speeds up to 150 mph, and a battery life of 20-40 minutes (flight time). As technology advances, the speed and range will likely improve. The near-term application is more likely a solution for traffic congestion than airline travel. Given the current technology, someone could live 60 miles from an urban center and be there in 24 minutes, without the hassle of sitting in gridlock traffic. This would seem to unlock many people

who feel a slave to the rising cost of living in urban centers. Meanwhile, picturesque pieces of land considered too far from the city with current transportation methods could become coveted properties.

Other big names like Airbus, Embraer, and Uber are getting into space as well. Uber has already staked out Dallas and LA as test cities and is seeking a third international city. Uber has released a 97-page white paper discussing the applications, vehicle types, risks, and economic benefits of this new form of transportation. (Read more [here](#).)

Now, there are obvious headwinds. Firstly, the significant and unresolved regulatory issues. Governments are understandably reluctant to permit drones clogging their skylines or, worse, glitching and posing a threat to the safety of civilians. Beyond governmental regulations, there is the costly issue of lacking/incompatible infrastructure. Where will they land? Where will they be stored? Where will they recharge? How expensive will it be? Will people's attitudes adapt to let a vehicle fly them without a pilot? All of this requires complex planning and thoughtful design. However, these are not roadblocks, but speed bumps on the road to progress.

Image not found or type unknown



5G, LI-FI, Way Faster Data

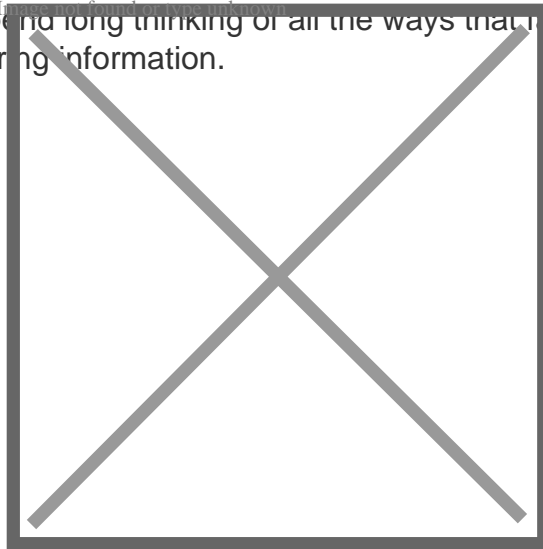
My wife and I recently went on a trip with some friends to celebrate her birthday. Throughout the trip, we took photos of dinner, sunsets, etc. on whoever's phone was most convenient. At the end of the trip, we had pictures scattered on four separate phones. To consolidate the photos, we used Apple's proximity photo sharing function, "AirDrop", which utilizes Bluetooth communication to transfer photos between devices. The process of transmitting a dozen high definition photos took seconds. Yawn. Who cares? We have become so used to information transferring at higher and higher speeds. It's almost become an expectation that the internet will get faster. This is a massive economic benefit that's measured nowhere and happens seemingly automatically.

Moreover, sharing photos is only the tip of the iceberg with regards to potential applications. Critical information can be shared faster with richer content. A doctor in a developing country

can access educational videos and even virtual reality training, allowing them to learn medical practices with tremendous ease.

Another exciting development in the “way faster data” sphere is a new technology called LI-FI. In short, it allows for data transmission at speeds 100 times faster than what’s currently available. Explained simply, it’s a fascinating technology that utilizes LEDs (light emitting diodes) to transfer data. The lights flicker at a rate so fast it’s undetectable to the human eye, transferring the data from a light to a decoder that then translates that data back to the user’s intended format. Photos, emails, videos, and more can be sent at lightning speeds. It’s not without its issues, however. It requires the use of ambient light, meaning it would not be functional in a dark bedroom or where walls separate the sending and receiving devices.

Other non-proximity-based technologies are arriving as well, such as 5G, which will continue the path towards a more connected world. We often overlook the impact this has on our lives. There is a famous restaurant in Napa, California, The French Laundry, owned by the renowned chef Thomas Keller, who is widely considered the most famous American-born chef. In his kitchen, he has a large TV that streams to his sister restaurant Perse in New York City. From a single location, he can monitor food preparation and communicate with staff to ensure that the dining experience 3,000 miles away is consistent with his standards. While this is a cute example, one doesn’t have to spend long thinking of all the ways that faster “internet” will improve the efficiencies of sharing information.



Source: Tech Crunch

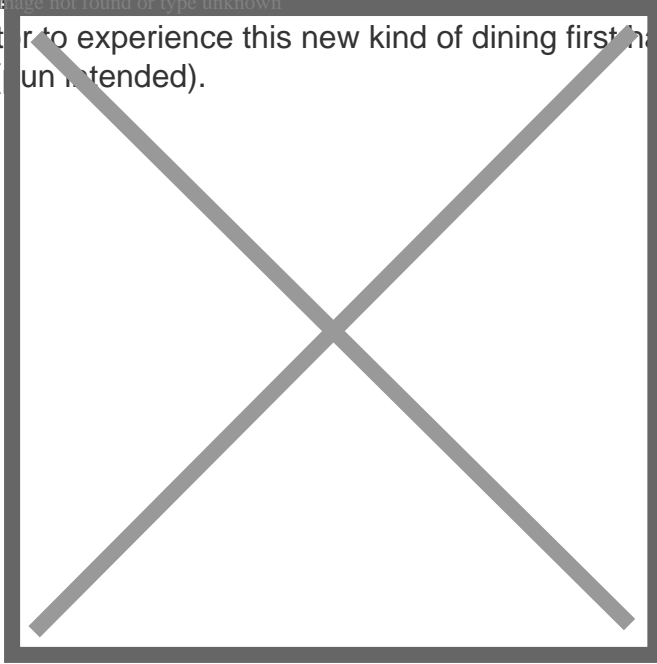
Artificial Intelligence (AI) / Automation

Definition: The theory and development of computer systems able to perform tasks that usually require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.

The projected impacts of this technology have already proven to be highly controversial, while only a minute fraction of the advantages have been even partially realized. It is undeniable that tremendous benefits will emerge from these technologies. The flipside is developments on this front will displace many lower level jobs that provide meaningful employment for the economy. But, as the cost of labor increases, I wonder how much longer we will be content to place a dinner order with a waiter/waitress. Why do we have to check into or out of a hotel? The reception desk provides you with a room key and asks for a credit card for miscellaneous

purchases. Can't a smartphone app do both of these things?

Companies are investing heavily in this space. Alexa from Amazon and Siri from Apple are being pushed on consumers. Today, you can say “Alexa, I need more paper towels,” then they arrive at your front doorstep tomorrow. Indeed, we are all adapting in the migration from human-to-human commerce to the new digitally-driven format, with varying degrees of enthusiasm. But companies are profit-driven entities. HR issues, health care costs, and rising wages are serious challenges to companies reliant on humans. None of those issues arise with Robots or AI. I am the first to admit that it will come in waves. A robotic house cleaner may be decades away, but many of these changes are happening now. There is a restaurant in San Francisco called [Creator](#) where you place an order on a tablet, and a robot makes your burger. Do consumers consider this restaurant as an attack on unskilled labor? Do they view it as a microcosm of where our economy is growing? Can it produce a user experience on par with a fully human-run operation? Time will tell. However, I will say—to the credit of such operations—I recently tried to visit Creator to experience this new kind of dining first hand, and the lines were too big to stomach (pun intended).



Source: If World Design Guide

Self-Driving Cars

To many people, the idea of not driving their own car is downright un-American. It's no secret that companies like Uber, Google, Apple, and Tesla are in an arms race to be the first to market a vehicle driven without the need for a human. Automakers are being forced to make hard decisions regarding the degree of investment they are willing to make on this front. If self-driven cars turn out to be a wild goose chase, billions are being wasted in corporate investment. On the other hand, ignoring this trend could leave legacy automakers too far behind the competitive curve.

Take a moment to muse with me on the future applications of self-driving cars... Amazon would be able to deploy a fleet of delivery vehicles devoid of drivers. They could route them around traffic jams and optimize delivery routes. Uber could cut their most considerable expense: labor costs. Commuters may elect longer commutes as they gain the ability to work in a vehicle that feels more like an office. Long trips could take place overnight as the rider sleeps.

The trucking industry is in the crosshairs as well. Long-haul truck companies are facing a massive shortage of drivers, which is increasing shipping costs. Even if more people choose to become drivers, they still bear the inevitable deterrent of being human in a job with the potential for full automation. They are prone to mistakes and are limited by a maximum eleven-hour day, while a self-driving truck has none of those constraints. Already, there are companies who've paired truck drivers with self-driving trucks. Long-haul portions of the drive are handled by the self-driving function with more complex urban portions of the route still being operated by a human driver. Companies like Volvo and Paccar have invested significant capital into preparing for a changing trucking landscape. There is tremendous uncertainty which bears investors' attention as this story continues to unfold.

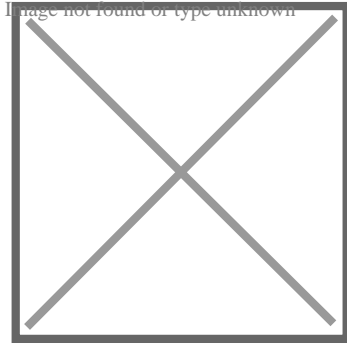
Admittedly, there are significant challenges to navigate. Recent accidents involving self-driving cars are fueling the anti-self-driving car critiques. Governments are navigating the political challenges of testing fleets and developing appropriate regulations. Will there be hurdles? Yes. Do I believe that car travel will be safer with AI driving than a 16-year-old on Snapchat, a drunk driver, or a senior citizen refusing to give up their driver's license? Unequivocally, yes. I think it is naïve to insist that humans will play as big of a role in the future as they have in the past. Where it settles and how soon the changes take place is anyone's guess, but my bet is disruption will come faster than most of us expect.

Conclusion

It's no secret that I'm a believer in the power of technology. It connects us, lowers the barriers to entry to industry, and empowers people to learn and gain knowledge previously relegated to the fortunate. The creative disruption it evokes speeds up economic progress. Future generations will experience things that were previously unimaginable.

For investors, this will bring uncertainty. New companies will emerge almost instantly. Companies that don't adapt will become obsolete. While it's clear to me that large portions of one's portfolio should be in technology, it's not as easy as it sounds. Of the Nasdaq's largest fifteen companies in 2000, only four remain. What makes this scarier is the fact that five companies (Facebook, Amazon, Apple, Netflix, Google) have made up so much of the stock market's recent growth. Netflix and Amazon are technically considered to be in the consumer discretionary sector, to which I take objection. Add in Microsoft, and you have a stock market that's being led by a very narrow group of companies. Many investors are betting heavily on these companies. I have my opinions as to which have staying power and which may become extinct. In the end, the conclusion is the same. Tech will continue to dominate the face of economic progress. Applications of technology will spread across all industries, but real innovation will originate from these types of companies. Being able to understand and analyze this space will become increasingly important and likely more complex. I've discussed only a handful of developments taking place that could alter the course of economic progress. Others I've omitted may prove even more vital. The bottom line is we are now in a lift-off phase in human progress that will not be without its bumps along the way, but the future is brighter than

ever before.



Tyler Hay

Chief Executive Officer

To contact Tyler, email:

thay@evergreengavekal.com

OUR CURRENT LIKES AND DISLIKES

No changes this week.

LIKE

- Large-cap growth (during a deeper correction)
- International developed markets (during a deeper correction)
- Cash
- Publicly-traded pipeline partnerships (MLPs) yielding 6%-12% (buy carefully after the recent rally; long-term, however, future returns look highly attractive)
- Gold-mining stocks
- Gold
- Select blue chip oil stocks (as with MLPs, be selective given the magnitude of the recent rally)
- Mexican stocks
- Short euro ETF (due to the euro's weakness of late, refrain from initiating or adding to this short)
- Investment-grade floating rate corporate bonds
- One- to two-year Treasury notes
- Canadian dollar-denominated short-term bonds
- Select European banks
- Short-term investment grade corporate bonds (1-2 year maturities)
- Emerging market bonds in local currency (start a dollar-cost-averaging process and be prepared to buy more on further weakness)
- Bonds denominated in renminbi trading in Hong Kong (dim sum bonds)

NEUTRAL

- Most cyclical resource-based stocks
- Mid-cap growth

- Emerging stock markets; however, a number of Asian developing markets appear undervalued
- Solar Yield Cos
- Large-cap value
- Canadian REITs
- Intermediate-term investment-grade corporate bonds, yielding approximately 4%
- Intermediate municipal bonds with strong credit ratings
- US-based Real Estate Investment Trusts (REITs)

DISLIKE

- Small-cap value
- Mid-cap value
- Small-cap growth
- Lower-rated junk bonds
- Floating-rate bank debt (junk)
- US industrial machinery stocks (such as one that runs like a certain forest animal, and another famous for its yellow-colored equipment)
- Preferred stocks
- Long-term Treasury bonds
- Long-term investment grade corporate bonds
- Intermediate-term Treasury bonds (moving to “dislike” on longer bonds due to recent breakout above 3% on the 10-year T-note)
- BB-rated corporate bonds (i.e., high-quality, high yield; in addition to rising rates, credit spreads look to be widening) * **
- Long-term municipal bonds
- Short yen ETF

* Credit spreads are the difference between non-government bond interest rates and treasury yields.

** Due to recent weakness, certain BB issues look attractive.

DISCLOSURE: This material has been prepared or is distributed solely for informational purposes only and is not a solicitation or an offer to buy any security or instrument or to participate in any trading strategy. Any opinions, recommendations, and assumptions included in this presentation are based upon current market conditions, reflect our judgment as of the date of this presentation, and are subject to change. Past performance is no guarantee of future results. All investments involve risk including the loss of principal. All material presented is compiled from sources believed to be reliable, but accuracy cannot be guaranteed and Evergreen makes no representation as to its accuracy or completeness. Securities highlighted or discussed in this communication are mentioned for illustrative purposes only and are not a recommendation for these securities. Evergreen actively manages client portfolios and securities discussed in this communication may or may not be held in such portfolios at any given time.