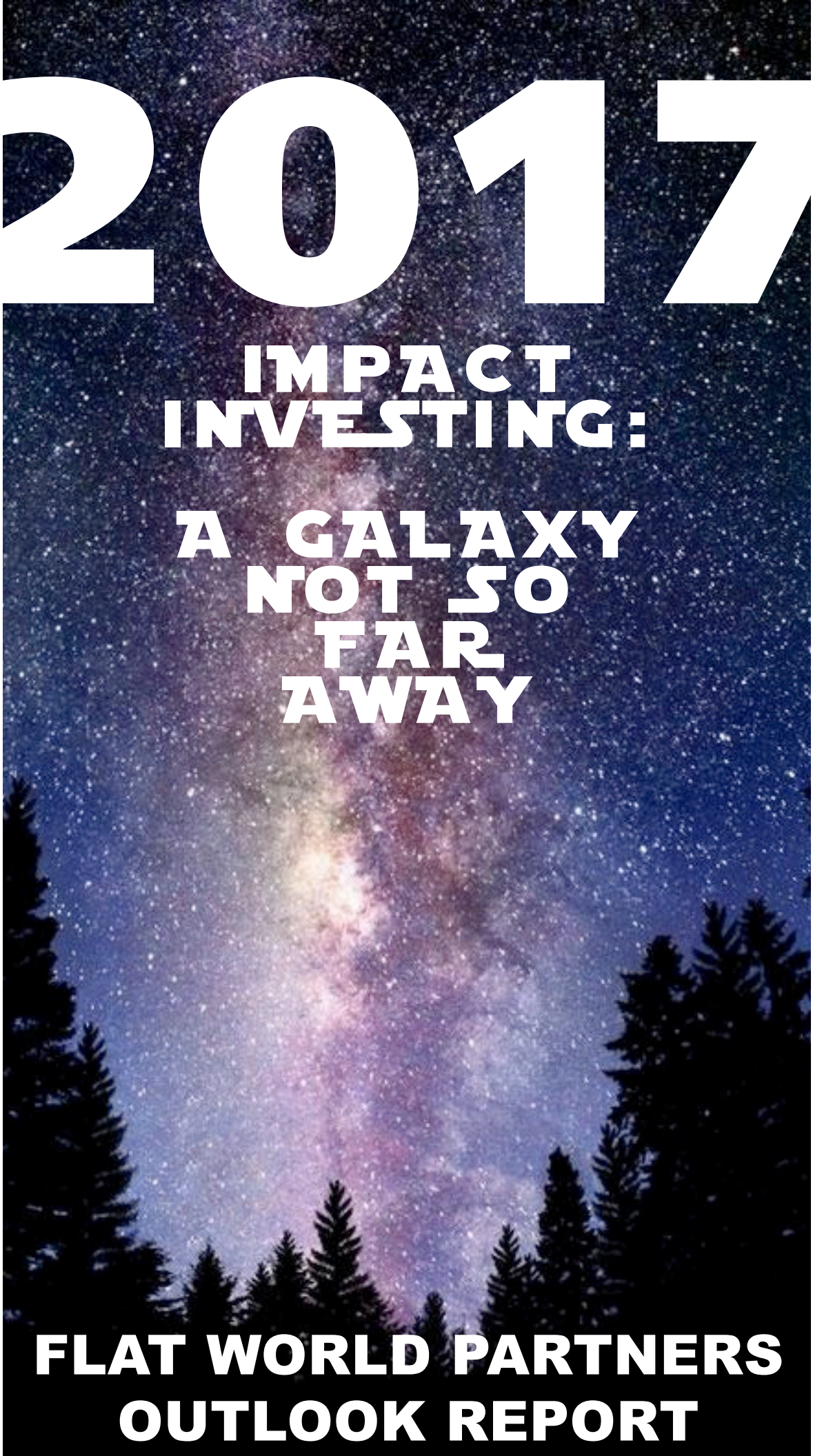
2017
IMPACT INVESTING:
A GALAXY NOT SO FAR AWAY
FLAT WORLD PARTNERS
OUTLOOK REPORT

2016 was a turbulent year, but with humanity's penchant for activism and assistance from the realm of technology, 2017 could prove to be a year of monumental change.

Flat World Partners
Annual Report

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"Change will not come if we wait for some other person or some other time. We are the ones we've been waiting for. We are the change that we seek."

- Barack Obama

IN THE BEGINNING

2016 can best be described by the title of the newest Star Wars movie, *Rogue One*... and maybe more concretely by a specific line in the movie: "The world is coming undone." In our 2016 outlook report we envisioned a turbulent year, and our issue areas were focused around terrorism, the elections and the environment. Yikes! When we thought turbulent, we meant a bumpy airplane ride over the Rockies, not Disney World's Tower of Terror. Ongoing conflict in Syria, worldwide terror attacks (the global economic cost of terrorism reached 89.6 billion U.S. dollars in 2015, up from 52.9), Zika, Brexit, police shootings, Turkey's failed coup, unpredictable elections, record-hot temperatures, the losses of Zaha Hadid, Prince, George Michael and David Bowie... what a ride.

Philosophers like Plato and Socrates can offer hints about our democracy's overall trajectory, but how will current trends play out within your portfolio? At Flat World, we take a macro view while building sustainable portfolios. We consider how sociopolitical turmoil can offer opportunity, while sustainable investment strategies can offer diversification and mitigate investment risks.

We predict that 2017 will be a year in which impact rises to the occasion. For every dark turn in 2016, we saw people fighting for a better collective future by becoming active participants instead of passive societal members. On the financial front, geopolitical shocks rocked markets last year, with an unprecedented year-end bull market in equities. It's not making a lot of sense.

So where do we go from here?
The Flat World team certainly felt the 2016 pressure, and though we made some excellent investments, we still asked ourselves, is impact investing the answer? Will 2017 be the year that impact moves at lightspeed into a leadership position in the global universe of investment strategies? We're looking ahead and giving you our best ideas for 2017... at least most of them. You have to be a client to get the special stuff.

DOMO ARIGATO, MR. ROBOTO?
AI & The Future of Work

"Meet George Jetson…"
Cartoon theme song lyrics may seem frivolous for the beginning of an investment report, but cartoons have proven prescient when it comes to recent events (*The Simpsons* predicted Trump winning the election. Look it up). In *The Jetsons*, people ride in autonomous flying vehicles and live in the sky because of too much smog. Eerie! But what's most pertinent is the way that the show depicted employment and work. George Jetson's job requires him to repeatedly push a single button (or on occasion, a series of buttons) on a computer named RUDI. Maids and teachers are robots, and the show even gave telemedicine its debut by featuring doctors that provide diagnoses through a screen.

Fast forward to today's political reality. With artificial intelligence popping up in everything from automobile manufacturing to financial analysis, there may not be a way to bring back jobs, as President Trump has promised. Instead, we'll have to create new ones. A report from MIT titled "The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies" (Norton) explains this. The report categorizes occupations using a matrix with two axes: manual versus cognitive, and routine versus non-routine (see Table 1). In the chart, the highest-paid jobs are clustered in the cognitive and non-routine box. Meanwhile, manual, non-routine jobs tend to be among the lowest paid but better protected from technology. Routine jobs on the factory floor, in payroll, or accounting departments tend to fall in between. It's these middle-class jobs that robots have the easiest time replacing.

Many Americans view trade deals as job theft culprits, but they may have been our savior. Trump has vowed to renegotiate NAFTA and to withdraw from the T.P.P. in order to bring back jobs, specifically those that are routine and non-cognitive, many of which have moved to China and Mexico. But these jobs may only be lost once again – this time to our own robots. China is already shedding them to robots by the thousand.

Q: WHERE HAVE ALL THE JOBS GONE?

Into the void of automation, that's where.

A 2013 study by researchers at Oxford concluded that nearly half of all occupations in the United States are "potentially automatable," perhaps "within a decade or two." Another group of MIT researchers has created an algorithm that shows how 3,000 four-person cars could serve 98 percent of New York City's taxi demand, with wait times averaging only about 2.3 minutes. There are currently 13,237 cabs and 42,000 taxi drivers in New York City. In the US, the number of manufacturing jobs has declined by 2 million over the last ten years and 6 million over the last 30. All the while, American factories produce twice as much as they did in 1984, using a third of the workers.

Those of you playing Investment Outlook Bingo know exactly what to expect next – a discussion of Artificial Intelligence (AI). But what exactly is AI? *The New Yorker's* Om Malik took a look last year and ran into some ambiguity, producing the following:

> *I asked various experts to define the term and got different answers. The only thing they all seem to agree on is that artificial intelligence is a set of technologies that try to imitate or augment human intelligence. To me, the emphasis is on augmentation, in which intelligent software helps us interact and deal with the increasingly digital world we live in.*

Malik's interpretation sounds reasonable, and predicts that this software and the machines it runs will help make our lives better. That's a relief, because Elon Musk and his merry band of techies are making AI open to everyone. Thanks to OpenAI, the technology's arrival in your life can be expected sooner than it otherwise would have – and from many more directions than just Google or Facebook, who have already invested millions into all of AI's moving parts.

Speaking of moving parts, what happens when AI gets inside the Terminator? That's called robotics, and one of said robots likely just finished plucking all of your holiday gifts from the shelf of the nearest Amazon fulfillment center.

Several new car manufacturers are growing by putting people and robots at the heart of their manufacturing processes. Tesla and other car makers are using tens of thousands of robots in manufacturing, and simultaneously creating jobs. Tesla employment jumped from 3,000 in 2012 to 13,000 in 2015. With the acquisition of Solar City, the largest residential solar company in the US, Tesla now employs over 30,000 people, all positioned for growth in the green economy.

AI and robotics could provide significant benefits to society: pollution reduction through driverless vehicles, advances in healthcare and education, and the increasing importance of STEM as a bumpin' field of study for our nation's youth.

Computer and data scientists are extending the boundaries of AI every day, but healthcare is one major economic sector where human interaction remains vital (pun intended). The sector is one of the drivers of economic growth in the US (17.8% GDP) and will continue to play an integral role in the economy as the population ages. The Bureau of Labor Statistics, however, isn't projecting a need for many more doctors – nursing is where most of the jobs will be created by 2022. Pushing more medical work to occupations that pay less than doctoring is one way that health systems are attempting to control costs.

	Routine	Non-Routine
Cognitive	Office assistants Sales agents	Managers, creatives, engineers, health care
Manual	Construction, mechanics, assembly line	Waiters, security

TABLE 1

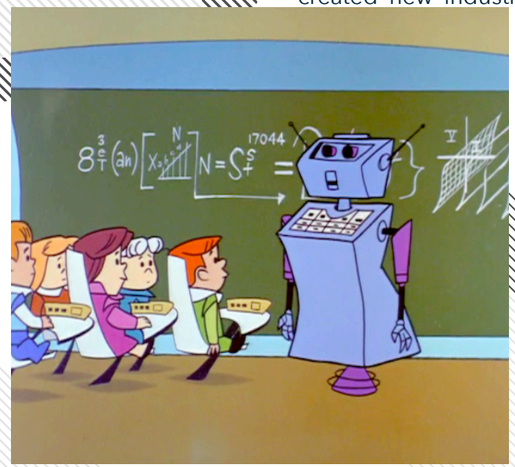
Advancements come at a price, but there are solutions. Technology training can increase salaries for 'routine' focused workers.

1. Teach the children and teach them well

Jan Tinbergen, winner of the Nobel Prize in Economic Science, once deemed our era as a "race between education and technology." When technology advances too quickly for education to keep up, inequality is exacerbated. Technology itself can be the solution, and data, if utilized correctly, can create a foundation for closing achievement gaps.

2. Restart the Startups

The economy must invent new jobs and industries. Ambitious entrepreneurs are up to the challenge, and may be better suited than well-meaning government leaders, who often rest on their infrastructure laurels. Thomas Edison, Henry Ford, and Elon Musk, created new industries that more than replaced the work that was being decimated by innovation - e.g. farming. So start your clean engines and invest in technology that is ~~reinventing workforces.~~



3. Tinder for Technology - Swipe Right

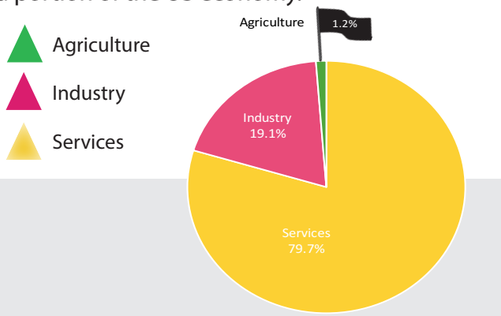
Making proper hiring decisions is crucial for any business. LinkedIn is developing a real-time database that describes the skills sought by companies and matches those skills with the training that students and other potential employees have. LiquidTalent, another HR startup has built a digital hub to empower these trends and propel us into a brighter professional future.

4. Bill Nye the Science Guy needs your money - support science

U.S. federal government support for basic academic research started to fall in 2005. We need to keep the funding going - innovations like The Internet (heard of it?) were born out of U.S. Defense Department research into how to build bomb-proof networks.

Automation in the services sector:

Making service work more efficient has an outsize impact on overall productivity figures, owing to the sheer magnitude of this sector as a portion of the US economy.



Startups creating the future of work:

ANDELA

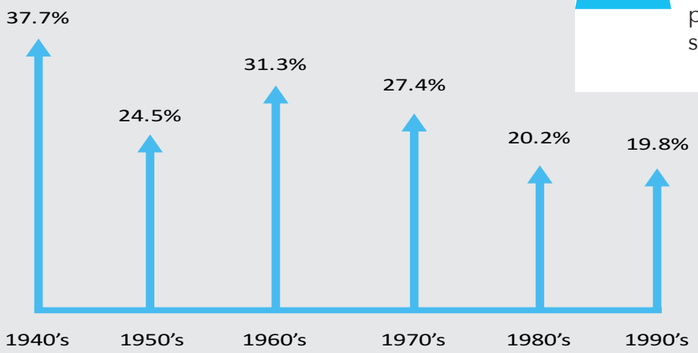
Andela is creating the future of work by training African tech talent, and providing this talent to top American software companies. It was named most innovative company in Africa by FastCo for 2017.

KERNEL

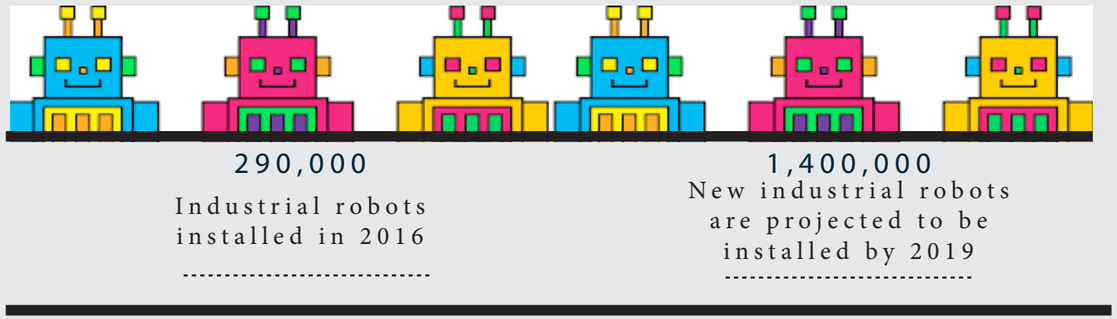
"Today the body, tomorrow the mind." Kernel seeks to create neuroprostheses, or technologies that increase human cognition. This type of space-age innovation could help human cognition keep up with machine cognition.

CLARK

Clark helps tutors grow their business by providing automated scheduling and payment systems, freeing up time for seeking out and serving more students.



U.S. Job Growth By Decade

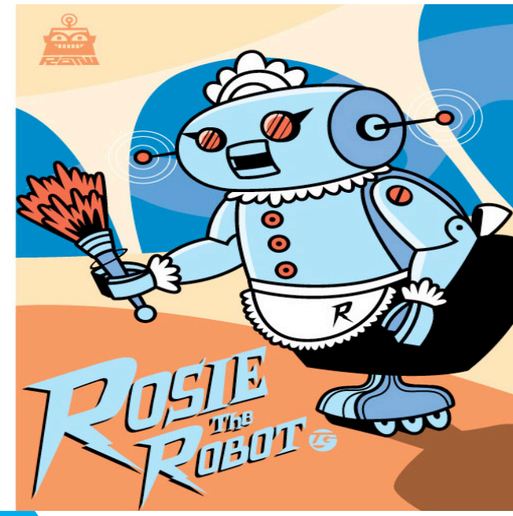


290,000

Industrial robots installed in 2016

1,400,000

New industrial robots are projected to be installed by 2019



Digital technologies have boosted productivity in the United States, but where is the the job growth that was once expected? While GDP has risen, median income has not, and wealth inequality continues to grow.

MO MONEY MO PROBLEMS

$11,000,000,000+

<<Combined net worth of President Trump's cabinet nominees.

Growing wealth inequality is one of the world's most pernicious social problems, as it is a summary statement of many other social challenges. In 2016, the average American family experienced the largest income gains since the 1960s, but the top 1 percent did much, much better. If you haven't noticed a disconnect between the wealthy and the middle class, please review Brexit, the Italian referendum, and, last but not least, America's 'revenge of the left-behind' election. Middle class families, as well as those struggling to make minimum wage, saw a chance to demolish the status quo – a status quo which, in their defense, didn't seem to be working well for them.

The sad news is that some of the greatest improvements in wealth inequality in the 20th century were products of World War II, and contrary to what some in Washington believe, war is too high a price to pay for economic growth. WWII significantly improved the earnings of those at the bottom of the social system by vastly raising demand for unskilled labor to serve the war effort. Social cohesion inspired by the war also helped to create an egalitarian ethos, laying the foundation for higher taxes. We as a society were rebuilding a future together. (HINT HINT.. the time has come again).

The election may have put us on the road to achieving the opposite of this vision. The new administration has done quite well under the existing political systems – Trump's hired hands have a combined wealth of around $11Bn, and many of his tax policies will directly help the elite instead of the middle class voters who propelled him into office. If history does indeed repeat itself, inequality will dovetail Trump's tax reforms for the wealthy, as it did in the Reagan era. The Tax Policy Center and the Tax Foundation predict that under Trump's plan, the top 1 percent of households will see their incomes rise by 10.2 percent to 13.0 percent. Middle income families, by comparison, may see an increase of 1.3 percent to 1.8 percent. Let's not even start on the deficit spending implicit in these numbers.

The current degree of wealth inequality, coupled with banks' historical focus on higher margin clients (i.e. upper-middle- to high-income consumers), has produced a larger need for basic financial services at the bottom of the economic pyramid, where customers are often perceived as too risky for banks. Startups are finding innovative ways to reach this growing customer base in a profitable and sustainable way, producing a win for their shareholders and for society.

A Trumpian Policy: Middle Class Tax Relief And Simplification Act.

An economic plan designed to grow the economy 4 percent per year and create at least 25 million new jobs through massive tax reduction and simplification, in combination with trade reform, regulatory relief, and lifting the restrictions on American energy. The largest tax reductions are for the middle class. A middle-class family with 2 children will get a 35 percent tax cut. The current number of brackets will be reduced from 7 to 3, and tax forms will likewise be greatly simplified. The business rate will be lowered from 35 to 15 percent, and the trillions of dollars of American corporate money overseas can now be brought back at a 10 percent rate.

MONEY MAKER

It's becoming clearer to many investors that the financially underserved represent a monster market opportunity. According to a recent study by the Center for Financial Services Innovation, the US underbanked population represents a $141 billion market (to repeat: just the US!), a figure that has grown an average of 5.6 percent annually since 2009. These developments show that while FinTech will undoubtedly experience growing pains, it is an ever-expanding industry that is making it more feasible than ever to create value by serving previously-ignored communities. The middle class, and even the poorest income earners, can access cheaper methods of lending, insurance, investing, and financial education through FinTech. The lion's share of these services were previously reserved for the wealthy.

JENNY FROM THE BLOCK(CHAIN)

We touched on Blockchain in our 2016 Outlook Report, and Blockchain's potential use-cases for bank processes have since been clarified, so we thought it was worth a revisit. There are many potential applications for the world's approximately 2.5 billion unbanked. As Accion Venture Lab points out, remittances, property rights, and digital identities are primed to benefit.

Traditional remittance services average greater than 8 percent in fees. Companies leveraging blockchain are able to provide cheaper and more efficient services around the estimated $582 billion that was sent by migrants to their home countries in 2015. Abra ($12m Series A raise in September 2015) allows easy money transfers worldwide without requiring a bank account.

In many emerging markets, poor documentation and fraud make land rights tenuous. These economies lean heavily on agribusiness, so the livelihoods of many of their citizens are constantly at risk. Factom's mission is to decentralize the world's records in real-time using blockchain, with applications for government, commercial, and non-profit systems. Blockchain's immutability allows companies to have far reaching impacts through improved land rights in emerging markets as well as various other use-cases.

Security issues among those in emerging markets have made headlines recently, due in large part to the Syrian refugee crisis and human trafficking. Bitnation is leveraging blockchain to allow individuals to receive a unique ID that proves their identity.

MARKETPLACE LENDING

MONEY TREES

The Obama administration began originating all federal student loans through the Direct Loan program back in 2010. President Trump's proposal to allow private lenders to originate student loans (Making Student Loans Great Again) means a potential reduction of the federal government's role in student lending, and a corresponding increase in the role of private lenders. The bright side is that this could lead to better customer service, streamlined processes, and tech-friendly features for consumers. #disruption?

One of the first FinTech subsectors to take off was marketplace lending, which has produced the first wave of FinTech IPOs (there are still many late-stage companies waiting in the wings for their chance to ring the trading bell as well). That's not to say that this subsector didn't take some tough hits in 2016. LendingClub grabbed headlines when it ousted CEO Renaud Laplanche over inappropriate lending practices and lack of disclosure regarding a personal investment (its stock ended down close to 54% for 2016). This scandal sent shockwaves across the industry, and lowered the valuations of many of its peers. Additionally, SoFi announced it will postpone its IPO, originally projected for mid-2016.

In 2017 we expect to see continued growth in companies that utilize FinTech to lend to underserved markets. Wunder Capital ($3.6m Series A raise in March 2016) is connecting investors to small businesses seeking loans to install solar panels. Camino Financial ($2m Series Seed raise in August 2016) provides loans to Latino- led small businesses and helps them build their credit. EFL Global uses psychometric and nontraditional data to create credit scores for small business owners and consumers in emerging markets.

MISS INDEPENDENT (1099)

The US independent workforce currently stands at 53 million, and is projected to grow to 66 million by 2020. These new labor dynamics are shifting risk from companies to workers, forcing a growing part of the population to grapple with volatile earnings, insurance, and savings dilemmas that most full-time workers don't encounter. These pain points represent significant opportunities for financial firms to better serve changing customer needs.

Nowsta ($2m Series Seed raised in May 2016) is helping temporary workers receive their wages the same day they are earned, and to book their next shifts on their streamlined recruitment platform. Digit ($22.5m Series B raised in June 2016) automates personal savings by setting aside money on a regular basis based on users' spending habits and what they can afford to save. Challenges to independent contractors are even more widespread in emerging markets, where Wala (undisclosed Series Seed raise in January 2016) is offering a community-driven and gamified personal financial management tool for cash-based consumers.

WALL-E STREET

Many people harbor the quaint notion that the physical Wall Street is, and will always be, the epicenter of banking. Today's and tomorrow's data analytics and algorithms are making mincemeat of that idea. With the globalization of banking and markets, some banking gets done on the southern tip of Manhattan, but most of it happens in cyberspace. New York, London, Frankfurt, - they're all banking hubs, but the people there are doing more and more of their work using sophisticated technology. Whereas a few years ago, banks offshored basic data entry to India, taking away the investment banking onramp for many college grads, today companies like Kensho can analyze the impact of major world events on financial markets within minutes. This analysis would have taken humans several days to do, perhaps with less accuracy.

For the past five years, investment management has been under siege by robo-advisors like Betterment and Wealthfront. But many investors don't like the idea of having their investments managed by a black box; they want to be more engaged with their investments and put their dollars towards opportunities that align with their personal values. Referring to increasing demand for ESG investing alternatives, Ben Johnson, director of Global ETF Research at Morningstar, commented, "If millennials and ETFs are BFFs, millennials and ESG ETFs are going to be the best of besties" (if you don't understand that sentence, ask a nearby millennial to translate). Millennials stand to inherit $30 trillion (the most dramatic wealth transfer in history) and will have a major say in the next couple of decades as to what types of financial products will succeed, and which ones will fall out of favor. Not accounting for ESG risk would be, to use convoluted economic jargon, a "bad idea."

With user-friendly technology in the mix, individual investors can strap into the driver's seat, knowing that their digital advisor will act as an autonomous vehicle. OpenInvest is a robo-advisor that allows people to customize their public equity portfolios according to their values, as the algorithm maintains a well-diversified portfolio of stocks and bonds. In the muni market, Neighborly ($5.5m Series Seed raised in September 2015) is making it easier for people to invest in civic projects that will improve their communities through specific municipal bond issuances. This democratization of sustainable investing, driven by companies like OpenInvest and Neighborly, is one of the principles on which Flat World has built its mission.

Values-based investing is no longer reserved for the wealthy.

BEEP BEEP, WHO GOT
THE KEYS TO THE JEEP?

$ 275kw/h = $4/gallons of gas

^ ^
The price needed to make electric cars cheaper than fuel-powered.

For the past five decades, the preferred method of transport for most Americans in and around urban and suburban centers (individually-owned, fuel-powered cars) has remained largely unchanged. In 2016, there was a burst of activity from new entrants and institutional investors in sustainable transport that could disrupt traditional travel methods. We see four high-level shifts driving this activity:

- Significant Reduction in the Cost of Lithium Ion ("Li-Ion) Batteries: A prominent Li-Ion end-user company CTO recently stated that his company's input cost of lithium ion batteries dropped by over 70 percent from 2015 to 2016, driven by large companies such as LG Chem, Panasonic, and Samsung producing batteries at an unprecedented rate. Prices are expected to drop even further as Tesla's "Gigafactory" continues to expand production (it will reach full capacity in 2020), with plans to manufacture more Li-Ion batteries each year than were produced by the entire industry globally in 2013. By 2020, GTM Research expects average lithium-ion battery costs to hit $217 per kilowatt-hour on average. These pricing forecasts are creating conditions for the widespread adoption of electrified vehicles, particularly city-sponsored transportation alternatives. With Li-Ion prices currently in the $250-$275 kw/h range, fully electrically powered vehicles are cheaper than fuel-powered substitutes.

- New Municipal Legislation:
  Several cities have begun a "war on cars" in order to fight to combat congestion and pollution (as much of 75 percent of pollution generated in major global cities is due to vehicle emissions). There was new legislation enacted by many global cities in 2016, including:

  o Congestion pricing in London, Stockholm, Singapore, and several Norwegian cities. Several other major cities, including Mexico City, are currently drafting similar legislation.

  o Outright bans on individual transport. Oslo, Milan, Brussels, Paris, and Madrid have all announced plans to ban cars completely from center sections of the cities.

  o Government credits: Government entities in Brazil (National Urban Mobility Law) and Europe (the EIB's October 2016 UN commitment) have pledged capital specifically to sustainable transport projects for comprehensive plans to enhance public transport, integrate transit fares and improve infrastructure for non-motorized forms of transportation.

FOUR DRIVING SHIFTS (CONTINUED)

- Shifting Millennial Auto-Buying Behavior: Millennials are shifting away from car ownership. A recent study by City Observatory found that millennials are about 29 percent less likely than those in Gen X to purchase a car. Instead, they're turning to a new set of services that provide access to products without the burden of ownership, giving rise to the so-called "sharing economy."

- Continued Worldwide Urbanization: Allow us to throw some numbers at you. In 1950, approximately two-thirds of the global population worldwide lived in rural settlements, and 1/3 in urban settlements. In 2016, an estimated 54.5 percent of the population lived in urban areas, and by 2030, these figures are forecast to rise above 60 percent. Between 2000 and 2016, the world's cities with 500,000 inhabitants or more grew at an average annual rate of 2.4 percent. However, 47 of these cities grew more than twice as fast, with average growth of over 6 percent per year; 40 of these high-growth cities are located in Asia. This ongoing shift has significant logistical and environmental implications. For example, while urban centers currently occupy less than 5 percent of the world's landmass, they account for approximately 70 percent of both global energy consumption and greenhouse gas emission. Innovation in urban infrastructure and technology is essential when addressing this issue; greenhouse gas emissions could be reduced by up to 1.5B tons of CO2 annually by 2030, primarily through transformative change in transport systems in the world's 724 largest cities.

These industry trends point to a clear investment opportunity in solutions that help solve these societal and environmental problems. In December 2016, the United Nations issued a report recommending a USD $2 trillion annual spend to address urban population growth and rising emissions. The UN recommends a "redirection" of current transport spending (approximately $1.5 trillion in 2016), in addition to added private capital investment. Clearly, while governments can help meet some of this need, private capital will be able to react more quickly to the opportunity at hand. The following are a few interesting companies and funds we've come across this year operating in the sustainable transport space.

o Proterra: A California-based technology company producing 100 percent emission-free, electric buses, which have been employed in several cities thus far to replace traditional transit options. With a daily range of over 300 miles, Proterra buses can serve nearly all of the current U.S. market for emissions-free buses.

o Volta Industries: A San Francisco-based company offering the largest free electric car charging network in the US, powered by a B2B-driven business model.

o Scoot Networks: A San Francisco-based company offering 100 percent electric-powered scooters for urban city transport.

o Urban.Us Fund: An Early-stage VC fund investing in companies re-imagining urban living, with a vertical dedicated to "urban mobility."

o Urban Innovation Fund: A VC fund with a dedicated focus on solving critical challenges in U.S. cities, including in sustainable transportation. They are an investor in several commuter fleet solutions.

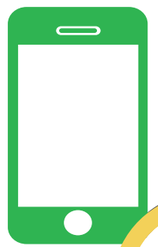
o Breckenridge Municipal Bonds: A municipal bond asset manager with capabilities to invest in Green Bonds, with an additional ESG filter. A customized portfolio could be dedicated to public sustainable transportation projects.

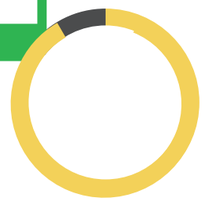
57% of Consumers Trust Driverless Vehicles

U.K. 45%

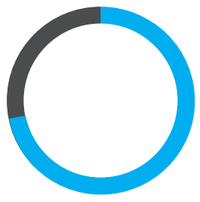
U.S. 60%

Japan 28%

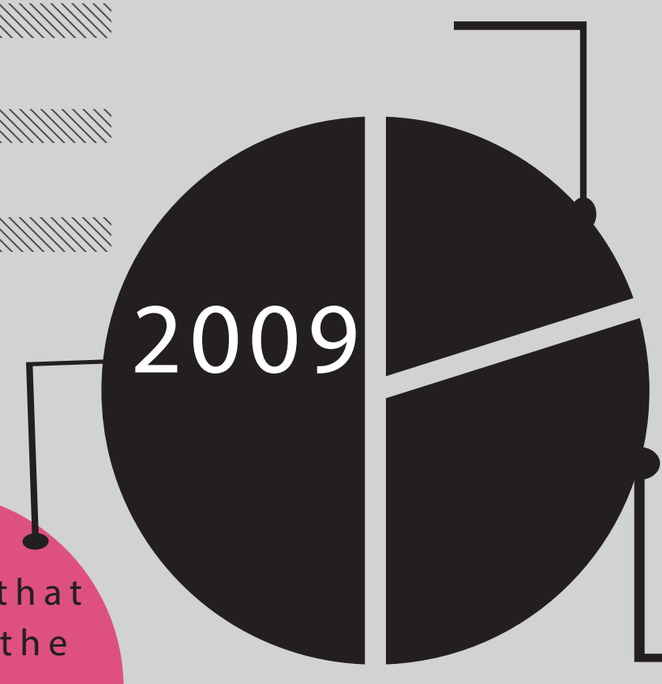




90% Productivity gain from autonomous vehicles



73% of U.S. urban residents drive alone to work



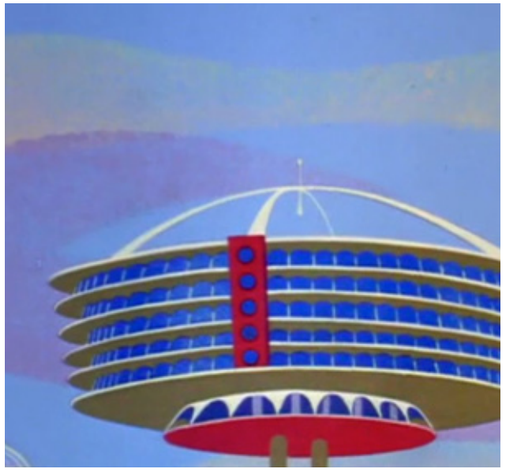
2009

First year that over 50% the global popu-lation lived in urban areas

"Right now the phone is an accessory to the car, but soon the car is going to be an accessory to the phone."
-Marc Andreesen

17M

Metric tons of greenhouse gas emissions saved each year by the NYC MTA



$1.5 TRILLION

SMART CITIES MARKET

1 BILLION

PEOPLE LIVING IN SLUMS

2 MILLION

TONS OF GREENHOUSE GASES EMMITED BY NYC

WE BUILT THIS CITY

ON TECH AND CODE

It may not be time to change your last name to Jetson just yet, but 2016 was indeed an exciting year for smart cities. As for 2017, we see private companies continuing to accelerate investment into this projected $1.5t market. Don't believe the hype? Ask AT&T, which rolled out its ambitious Smart Cities Initiative this year, and is partnering with Cisco, Ericsson, GE, IBM, and Qualcomm to bring its framework to several "spotlight cities." Or ask GM, which threw a cool $1b at Cruise Automation and $500m at Lyft's self-driving car initiative. Or ask New Yorkers about LinkNYC, the public-private collaboration that brought gigabit WiFi/phone portals to the streets of our beloved city.

2017 promises to be a significant year for smart cities, as city governments and the private sectors come together to make city living less taxing – at least in the non-monetary sense. Our native NYC will bring together academics, governments and major technology companies for SMART CITIES NYC '17, a conference and expo at the intersection of technology and urban life.

What exactly makes a city "smart?" At the heart of it, building a smart city is about improving the quality of life for urban residents through informatics and technology. It's about combatting the portion of climate change that stems from increased global urbanization, and more efficiently managing city assets such as water supply networks, information and transportation systems.

SO SMART AND SO CLEAN, CLEAN

Most of the grandiose visions of emissions-reducing municipal tech – smart streetlights turning on and off as pedestrians pass, drivers knowing how to find parking spots in real time, waste collectors knowing how full trash cans are, and traffic lights preventing traffic jams – all share a common element: sensors. One startup providing this type of real-time data to cities is OnePlus, which in 2016 acquired SmartBin, and currently provides real-time data solutions to Tucson and Sydney.

Cities of the future will need to be more resilient – cue distributed, renewable energy generation. The price of solar energy has dropped 80% in the last six years, and despite a dismal year for solar stocks and the potential policies of President Trump, the economic facts are on renewables' side. The US solar sector had its biggest quarter to date in Q3 2016, with over 4GW of added capacity, but solar stocks' dismal 2016 performance indicates that investors need to be able to spot smaller trends within the renewables revolution. One example: does your roof double as your upstairs neighbor's floor, eliminating your dreams of solar panel installation? No problem. Community solar projects allow apartment-dwellers to virtually claim energy from solar farms on city outskirts. The idea is new to many city dwellers, but private companies have already signed virtual power purchase agreements that allow them to claim energy from off-site renewable generators. Google reached its goal of being 100% renewable in 2017 – not bad for a company that consumes as much energy as the city of San Francisco. Read more in our 2017 Renewables Outlook.

Cities account for roughly 70 percent of global greenhouse gas emissions, according to United Nations-Habitat, the UN's program for urban development. By 2050, global urban populations will double. This is not necessarily a negative development when it comes to GHG emissions, since many cities are more efficient per person than rural areas. Still, innovation will be needed to make cities even more efficient.

The Department of Transportation published findings from the Smart City Challenge that exposed similar challenges faced by mid-sized cities around the U.S. 78 participating cities faced similar challenges in urban mobility:

- The typical job is accessible to only 27 percent of the population in 90 minutes or less by transit
- Moving goods within cities is costly ($28m in truck operating costs and fuel)
- Reducing inefficiencies in traffic (30 percent of traffic in urban areas caused by cars looking for parking)
- Limiting carbon emissions continues to be a challenge (78 applicant cities represent over 1b tons of CO2 emissions per year)

According to Gartner, smart city technology has been the fastest-growing area within the Internet of Things (IoT). So it is no surprise that tech behemoths – Google, Microsoft, IBM and the like – are actively playing in this arena.

One key arena for said tech behemoths (and startups) is the reduction of urban emissions. Sidewalk Labs, a subsidiary of Google's parent company Alphabet, is working on overhauling public parking and transportation in American cities. Sidewalk is offering its cloud software, Flow, to the city of Columbus, Ohio, winner of $50m from the 2016 Smart City Challenge.

Flow would use camera-equipped vehicles, such as Google's Street View cars, to count all the public parking spaces in a city and read roadside parking signs, combining this with data from Google Maps to estimate which parking spaces were still vacant.

Smart city innovation takes green (both the mindset and the monetary), and startups are disrupting the way that innovation is funded as well. Startups like the aforementioned Neighborly allow investors to put their money into local municipal bonds, enabling individuals to fund projects that they'd like to see in their communities. Another trend we see is the financing of smart city innovations using advertising dollars. Volta Industries is financing its physical infrastructure costs and services with their advertising platforms, the same way that Intersection was able to provide LinkNYC portals at no cost to New York ($500m in projected revenue for the city). This business model is not new, but now that it's been implemented in the context of smart cities, we see it picking up as a way to finance infrastructure for the cities of tomorrow.

Of course, real-time parking information represents just a sliver of the transportation revolution. For many, Uber's 2016 Pittsburg self-driving car rollout (and even the press surrounding its fiasco in San Francisco – what red light?) was a wake-up call: the autonomous driving era is *almost* nigh. Of course, this came as no surprise to investors, and to Silicon Valley boardrooms. Many are now claiming that this technology will be bigger than the smartphone, and that our ways of living in cities will change fundamentally. In the next few decades we could be saying goodbye to parking infrastructure, and hello to cheaper delivery, garbage, and transportation services. Flip back to the "Infrastructure & Transportation" section for more.

Accelerators and funds of urban innovation are also hotter than ever. SOSV and Hax are teaming up to produce Urban-X, an accelerator for startups looking to bring technological innovation to bear against cities' biggest challenges. Bloomberg Philanthropies has multiple initiatives to improve city life, through initiatives such as the Mayors Challenge and What Works Cities, and it has given $42m to help cities utilize data. One winner of a Bloomberg-era NYC government challenge, Urban Umbrella, is hoping to improve sidewalk strolls with better scaffolding, an overdue disruption if we've ever seen one. Outside of government actions and initiatives, we continue to keep our eyes on venture funds such as Urban.Us and its portfolio companies. In light of the 2016 results from the Smart City Challenge, we are also keeping tabs on specific cities, namely Austin, Columbus, Denver, Kansas City, Pittsburgh, Portland, and San Francisco (all finalists from the 2016 Smart City Challenge that have secured government funding to execute on their proposals).

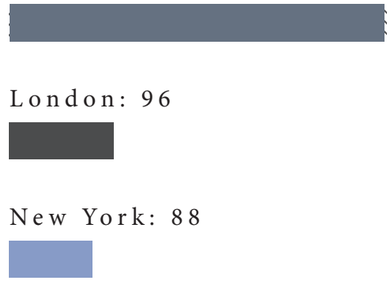
3.6 BILLION

PEOPLE LIVE IN CITITES

21

CITIES WITH > 10M PEOPLE (UP FROM 3 IN 1975)

Top IOT Cities: Number of IOT company HQ's (2015)



Spotlight: NSF Smart Cities Initiative

In September 2016, the National Science Foundation announced more than $60m of Smart Cities grants, with additional investment planned for FY 2017. The breakdown of these funds sheds light on the initiative's central priorities.

$25.4m for "Smart and Connected Communities," with a focus on collaboration between researchers and comunity members.

$10m for next-generation internet technologies.

$8.5m for high-risk research within the Smart and Connected Communities category.

$4m for cyber-physical systems (think self-driving cars).

$2m for "spokes" that expand regional innovation hubs, e.g. improvements to electricity and transportation infrastructure.

$1.5m for health and science research.

$1.4m for community-focused big data.

$1m for the 2016 NIST Global City Teams Challenge (includes funds for real-time flood monitoring in a handful of Maryland cities).

WE ARE

THE WORLD

Q: WHERE DO WE GO FROM HERE?

Contrary to popular "slacktivist" belief, hashtagging #NotMyPresident isn't going to start the revolution needed to supercharge our country. The good news is that many private companies and funds are holding steadfast in their principles by investing in the next positive revolution. Guess what? You can too.

Canada has resisted Trumpian slash-and-burn-style immigration policies, but other governments have struggled to adequately respond to the massive flows of displaced people entering their countries. The flows of refugees and immigrants have fundamentally altered the recipient countries, in some cases for the worse, and in the vast majority of cases for the better.

Of course, we're capitalists first and foremost. Setting aside the moral and humanitarian imperative that we all face to help our fellow man in need, organizations such as the Tent Foundation and Open Political Economy Network have shown that investing one euro in refugee assistance can yield nearly two euros in economic benefits within five years. That equates to about a 14.4 percent investment return compounded annually .

If you still don't see the opportunity, perhaps legendary investor and famed contrarian George Soros can convince you. He pledged $500m in investment (not grants) to refugees. In his own words:

> *"Our collective failure to develop and implement effective policies to handle the increased flow has contributed greatly to human misery and political instability– both in countries people are fleeing and in the countries that host them, willingly or not. Migrants are often forced into lives of idle despair, while host countries fail to reap the proven benefit that greater integration could bring... I will invest in startups, established companies, social-impact initiatives and businesses founded by migrants and refugees."*

According to Soros, some of the most interesting sectors for investment benefitting refugees are Emerging Digital Technology, Consumer FinTech (specifically money transfer), and TeleHealth. Here are two promising impact startups that both fit 2 of these categories:

VSee started as a simple desire to create a group video chat app that didn't drop calls or freeze video like Skype, and to protect privacy by not going through servers like Google Hangouts. The result? A simple, low-bandwidth video conference and fast screen share tool initially used only in niche circles like NASA and the Navy SEALs. Now VSee is becoming a favorite tool for social change and doing business within the BoP (Base of the Pyramid) model. VSee has been especially appealing to those who care about global health care.

mPower has created an innovative mobile healthcare application that connects rural patients to doctors. The founder, Amader Daktar, aims to "improve rural health care and reduce the number of people whose illnesses are aggravated by a lack of, or delay in, proper diagnosis and treatment."

In its Social Investment Insights series, UK-based Big Society Capital explores several recommendations for how impact investors can help promote the integration of refugees through innovative investment structures. Two of these recommendations are listed below:

- Housing Plus for Resettled Migrants - Cheyne Capital launched a property fund that owns and leases affordable and bespoke housing for vulnerable communities. Commonwealth aims to accommodate 210 vulnerable migrant families and 126 individuals.

- Immigrant Access Fund - Many refugees and asylum seekers are highly qualified (e.g. architects, lawyers) in their home countries, but are not recognized in new country. Canada launched IAF has already provided $13m to thousands of migrants, with a 98% repayment rate.

In London, Transitions was created as a recruitment agency focused on refugees. This social enterprise recognizes that there are many refugees that are highly educated and were professionally accomplished in their home countries, and that these refugees need more assistance than the domestic job seeker in order to transition to employment in their new countries. Employers benefit from diversity and access to the best talent available. Transitions benefits society and its bottom line, seeing opportunity where others saw a problem.

Is immigration needed for GDP growth? According to the United Nations Department of Economic and Social Affairs, Europe actually needs immigration to slow or reverse the shrinking trend in the working age population. For example, Germany's working age population is expected to shrink by 13 million between 2010 and 2050. Economic growth is driven in part by the number of workers; a shrinking labor pool makes achieving economic growth even harder. The influx of refugees seeking work could help to alleviate this long-term threat to economic growth in Europe.

IN THE END - Socrates & Plato

Plato's theory of democracy differentiates between necessary and unnecessary desires. Food and shelter are necessary, while desires we are able to overcome, yet choose not to, are unnecessary luxuries. These types of desires are a result of a rapid influx of liberty into the population – most often driven by... yup, *democracy*. Plato predicts that the people in a democratic society will demand increasing amounts of liberty. Freedom becomes an obsession, jeopardizing social order and structure.

Socrates believes that tyranny is established under no other regime than democracy. Democracy is a political system that maximizes two things: equality and freedom. The longer a democracy lasts, the more democratic it becomes – a "many-colored cloak decorated in all hues." Animals have rights, children boss their parents around, the rich try to look just as the poor, and foreigners can come and go as they please. Soon every kind of difference is loathed, and the elite are especially despised. Plato argues that when a democracy evolves into this, a would-be tyrant, often from the elite but in-tune with the times, makes his move. He takes over a particularly obedient mob and attacks his wealthy peers as corrupt. Eventually he stands alone, offering a type of relief from democracy's endless choices and insecurities. Democracy devolves into tyranny.

In the big picture of the universe, individual political outcomes are single stars that eventually fade, while mass movements are supernovas. When you look at stars, you are gazing up at history; light takes so long to travel that the physical star you're looking at may no longer exist. This mimics the reverberations of political outcomes: often the repercussions are not felt until after presidential candidates have left office. A supernova is an explosion caused when a star reaches a certain point in its life cycle. These events can briefly outshine whole galaxies. They can destroy anything within a hundred plus light years of the event. They are also the most important type of event for the development of complex matter and, by extension, life.

It is clear that Plato's theory of democracy has played out in 2016 – a supernova type of event in political theory – and 2017 may be the phase where complex matter is created. It's not 'impact investing' that can help us choose what 'matter' we create – it is smarter investing decisions that align our values and the world we create.

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