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# *SPECIAL REPORT*

# Global Overview: The Milken Institute Global Conference 2019

## *Measuring the Winds of Change*

By: Jim Altenbach, CFA

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# Measuring the Winds of Change

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In May of this year, over 4,500 attendees and 700 thought-provoking panelists from around the world gathered in Los Angeles, California, for the 22th annual Milken Institute Global Conference. Speakers included Nobel Prize winners, top industry leaders, scientists and heads of state, including, U.S. Commerce Secretary Wilbur Ross, Christine Lagarde, SoftBank's Rajeev Misra, Paul Kagame, and other luminaries. Almost 200 panel sessions offered a global overview of pressing questions facing investors and decision-makers. There were numerous panels on technologies that are fundamentally changing society, business, and investing. We present topics of interest to those with an eye toward growth, progress, and innovation.

MILKEN INSTITUTE GLOBAL CONFERENCE 2019

# A Conversation with Christine Lagarde

The 22nd annual Milken Institute Global Conference kicked off in Los Angeles with an onstage conversation between Christine Lagarde, Chair of the International Monetary Fund (as of November, President of the European Central Bank), and Gerald Baker, Editor-at-Large of the *Wall Street Journal*.

**Sustained Growth Potential**

Baker started the discussion with the global economy. Asked if Lagarde thinks the United States seems to have moved into an elevated phase of growth, she responded that we need to analyze where the growth is coming from. However, "given the investment in new technologies and capital expenditures (CapEx) we've seen in the last four quarters, we expect to see some improvement in productivity." A productivity improvement would increase sustained growth potential, according to


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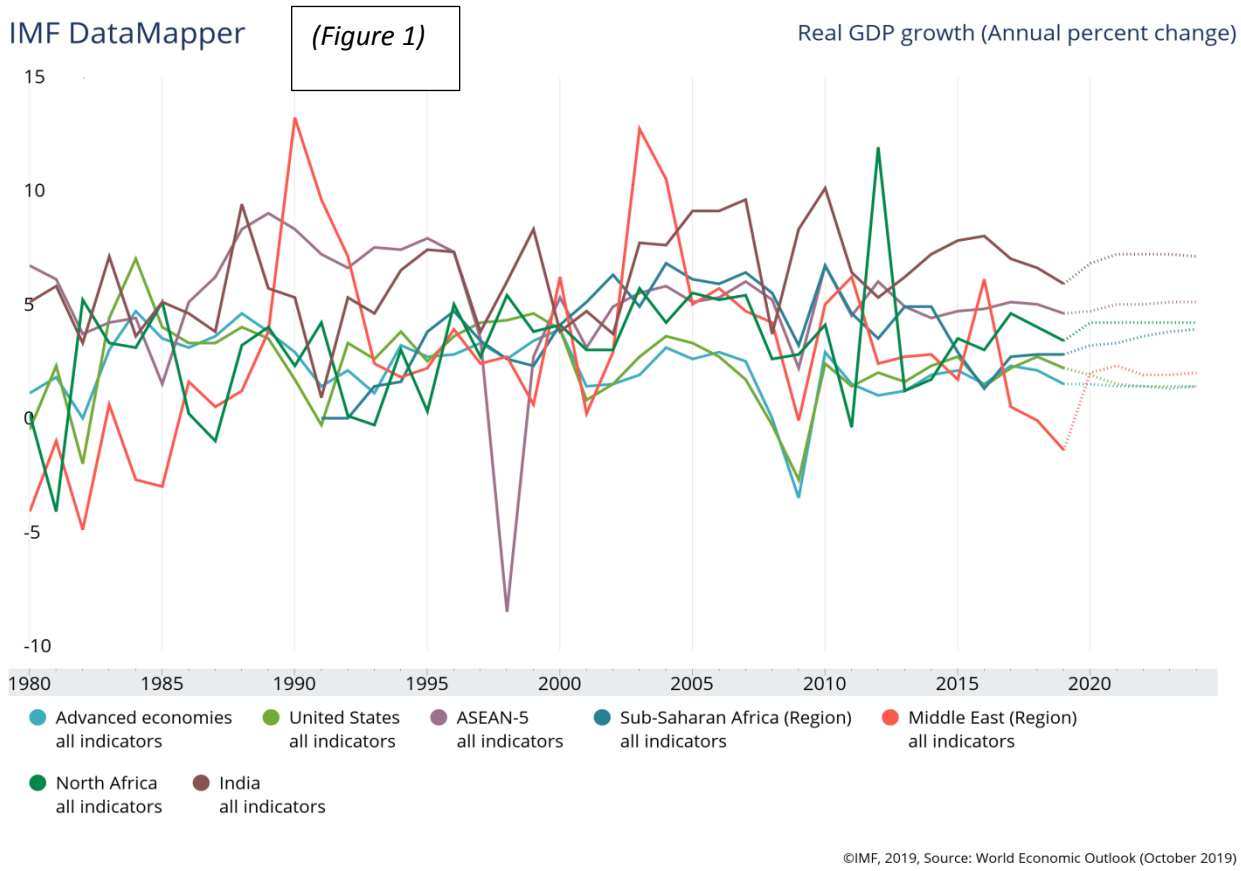
**A Supply-Side and Market Based Perspective**

Lagarde over-emphasized the importance of consumption. It would be prudent for her to evaluate the Gross Output (GO) model, which does not recognize consumption as a majority component of output, nor does it weigh government spending as much as is the case with the GDP measure. GO is a natural measure of the production sector.

**What Do the Markets Tell Us?**

David Ranson, Director of Research at HCWE Worldwide Economics, uses market prices and Supply Side statistical models to give us reliable data of where the economy is headed. Since Global Conference, a persistent rise in the gold price indicates a moderately inflationary growth scenario going forward. Also, we've had spates of volatility in credit markets. However, Ranson maintains as long as business friendly policies toward taxation and regulation remain, that long term real GDP potential can still reach 3 percent. (For a full account of Lagarde's discussion at the time including the Philips Curve, as well as, tax and trade policies, please see author's RealClearMarkets pieces for 2019, 2018, and 2019 respectively.[1,2,3]) On 11/30/19, Ranson noted that equity indexes adjusted for implied volatility forecast real GDP of 2.9% for first 10 months of 2020 (See "Figure 1" below).




**Inflation and the Phillips Curve**

Baker turned the focus of the discussion to inflation, stating despite low levels of unemployment and high growth in many countries, especially in the United States, "suppressed inflation" exists. He asked Lagarde to explain the "suppressed inflation."

She replied: "It's a bit of a mystery. The famous Phillips Curve should lead inflation up given we have very low unemployment."

Actually, there really isn't a mystery. The Phillips Curve no longer has statistical power. Former Fed Chair Paul Volcker views the Phillips Curve as unreliable and believes its use should be discontinued. Alan Greenspan shares this view. Nevertheless, Fed staffers still use it as do many members of the New York Fed and other policy makers.

The late economist Jack Treynor believes its continued use can potentially cause drastic consequences through bad policy decisions. Indeed, Treynor postulated the potentiality of the extreme. Treynor cited Japan of the 1980's. E.g. Japan's central bankers "went with the Phillips

Curve and expected inflation. By the time they could reverse their policy it was too late. The result was a classic liquidity trap, with negative inflation rates."

Notably, current Fed Chairman, Jerome Powell, recently discounted the Phillips Curve. Lagarde should do the same.

**Inflation Targeting**

Inflation has underperformed the Fed's expectations every year for about seven years. When asked "have the monetary policymakers got this wrong?," Lagarde commented:

"I wouldn't say wrong. They have a mandate of price stability. The number set for decades is around 2% in order to have growth in the economy." This mandate is called "Inflation Targeting," and Lagarde rightfully questioned whether the mandate is justifiable.

Many experts argue the target rate should be increased to 4%, something Lagarde doesn't see the logic of, especially since we can't even get inflation to 2%.

There is ample evidence the mandate of inflation targeting is flawed. The Federal Reserve Board studied countries that adopted "Inflation Targeting" and indeed found that core price inflation dropped, including in the United Kingdom, New Zealand, and Canada. However, the definition of inflation can be too narrow. By ignoring inflation of the money supply and assets such as real estate, stocks, and commodities, asset bubbles can lead to a collapse in real estate or stocks (e.g. 2008-2009,) explained Mark Skousen in his text book "Economic Logic."

In addition, the presumption of the need for any "built in inflation" – that is inflation targeting – is itself an issue. Zero inflationary growth is possible and desirable as was demonstrated in the 1980's.

The moderate inflation portended by a rising gold price which manifested since June in no way revalidates the Philips Curve. The rise is easily traced to the tensions that started in The Strait of Hormuz in June.

## Panel: Global Overview: Measuring the Winds of Change

While global policy continues in a state of flux—surrounding trade, recession fears, and geopolitical turmoil —living standards continue to rise as technology leaps forward and economies continue their slow but steady growth. But how can we ensure that we engage and deal with the issues that could unsettle society while expanding opportunities across countries?

**The West, Africa, and China's Outreach:** The West often has anxiety about China's presence in Africa. Ask if the West is overreacting to China's Africa outreach, His Excellency Paul Kagame, President of Rwanda, allayed fears and concerns by a section of Western countries. He explained: "the problem of anxiety by the West relating to China's involvement in Africa, has more to do with the West than with Africa. And therefore, that means the competition between the United States, or the industrialized world with China, finds Africa caught in between. But Africa has its own needs and its own interests as well, whether we want to see it that way or not."

The African continent, he said, ought to be viewed as a party with its own needs and interests.

**AFRICAN DEBT:** Asked about the purported "African Debt trap," due to the huge debt that Africa is taking from China, Kagame downplayed the fears: "I would rather think the concern should come from, first and foremost, Africa, not from outside of Africa. The question to be raised is why is Africa taking on this huge debt? It's important that Africa, if it is taking debt from anywhere, it is debt that is going to be invested in productive assets that will enable Africa to repay the debt in the first place." Africa has not had debt just from China, it has had it from the traditional investors, even though in the recent past, there was debt forgiveness. The question is always going to be, what has Africa been doing with this debt? And that can only be answered by Africa." Statistics show that the continent borrows from multiple parties on different terms.

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“Rwanda and the rest of the continent consider Western Countries as partners or investors of choice for Africa. If the West was doing investments that are required in Africa, then Africa will stop being caught in this trap or competition,” he said.

**Africa and CORRUPTION**: Kagame also addressed fallacies that corruption is only limited to the two parties –Africa and China. Kagame stressed: “The assumption here is that corruption is confined to China and Africa, and that the west does not get involved in corruption, which is not true. Nobody should give an excuse for corruption, it should be fought wherever it comes from and that is what we have been trying to do in our countries and in other African countries.”

**Michael Pillsbury: U.S. and WESTERN Foreign Policy toward China**: It's striking that, in foreign policy, President Trump's policy towards China is one of those areas where there’s actually fairly broad support. Many people wished that on trade, that he were more multilateral. But the idea of being tougher on security in the South China Sea, being tougher on trade, is popular.

Asked to discuss his perspective on how we can manage the China relationship, and whether the world adequately appreciates the risks, **Michael Pillsbury, Director of the Center on Chinese Strategy, Hudson Institute, and Author, "The Hundred-Year Marathon**," observed: “there is strong bi-partisan support to be tough on China. Seven members of the Democratic Party wrote a letter to Trump asking him to be tougher on trade matters.” For a discussion on trade issues, see author’s 2018 RealClearMarkets article on trade.[3]

“The question is, how far to go? Do we really want to demonize China completely to say they do no good at all, that when they loan money to Africa, it's really subversive and evil? Do we want to declare a new Cold War against China? I think not. I think there's very little support for going that far. But being too weak could also have its downside.”

Pillsbury explained: “Finding this magic area in between is what President Obama, started doing. Tony Blinken at state summit defense began to talk about returning to the great power of competition mainly

against China. Secretary of Defense Mattis went farther and gave a number of speeches where he said 'terrorism is not the main threat anymore. North Korea and Iran are not the main threat anymore. Our new defense department strategy puts China at the top'."

President Trump used a simple phrase: "Good China, Bad China." Very simple: It's certainly been known and for decades, when people have tried to nurture the "good China" (and ignoring the "bad China" tendency) by bringing it into the WTO, making it a stakeholder, it took advantage of other countries. Pillsbury called this thinking "Very naive in retrospect."

"Where's the magic spot?" pondered Pillsbury. "You have to think about cooperation first. If you don't think about cooperation with China, you lose a lot of players in our domestic political system. That said, the areas of competition have been terribly neglected."

**TECHNOLOGY TRANSFERS to CHINA:** Pillsbury then shared a fact that may shock many. ***"Who realized that we have over 100 agreements with China to transfer our scientific discoveries to them immediately?*** We had an office in Beijing that was funded by Congress. ***The National Science Foundation was to immediately transfer any new American scientific discovery to the Chinese government***. There's a long list of these areas of inadvertent support for China, for which China never gave us credit for. This is one of the areas President Trump, and legislation is also focused on this to cut back on inadvertent support."

"Henry Kissinger said he never anticipated this massive growth rate could be sustained for 30 years," Pillsbury said. The World Bank's largest office in the world was in Beijing. They helped design China's economic policy for the next 35 years.

"The head of the World Bank in 1980 was Bob McNamara. He was the first World Bank President to visit Beijing and start them on the right track for economic growth."

**INDIA:** On a panel on India, Ravi Kuma, President of Infosys Limited explained that India is the fastest growing major economy in the world today, having grown for 30 years at 6%. Few countries can match that. India's GDP is expected to grow 7% in 2020, verses 6% for China (See figure 1 above.) Asked "What does India need to do to sustain that growth?," Kuma responded: "India is a confluence of paradoxes; The opportunity for India to cater to a global market is broadly driven on three factors: 1) the demographic dividend; Not just the demographic changes in the country, but also across the world, 2) the pace at which globalization happens and that is free flow of capital and goods, 3) the embrace of New Age digital or industry and the ramifications of it as work moves between different countries."

Watch Video: India: http://milkeninstitute.org/videos/finding-opportunities-indias-next-chapter

## Transforming Economies: Investment in MENA:

On a MENA panel, speakers discussed the MENA countries' seismic shift from oil based economies to manufacturing and service based economies. Government revenues that used to rely on crude oil will increasingly be gotten from a VAT. Opportunities in infrastructure hard and soft exist, as well as in SME's.

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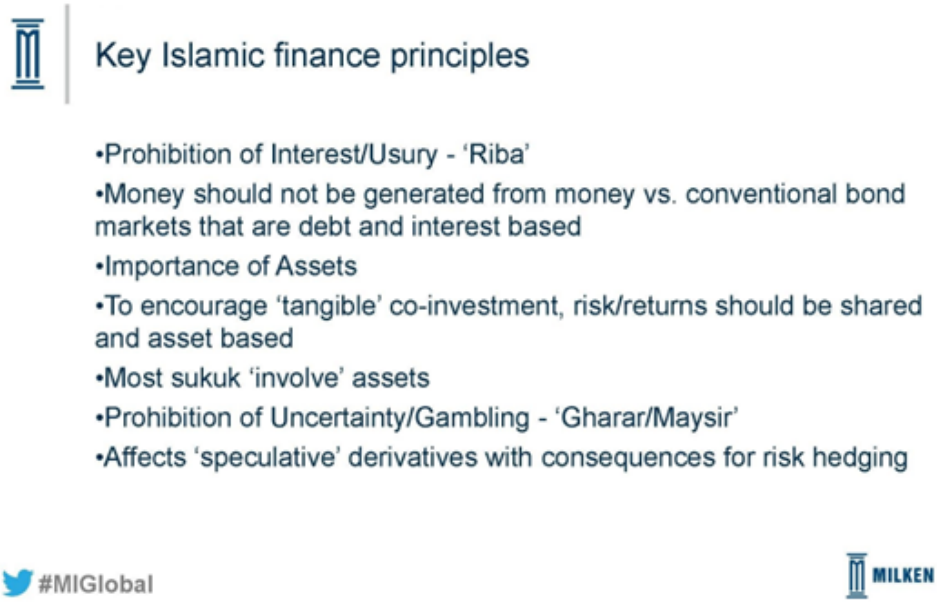
**Why Invest in MENA?**

Hazem Ben-Gacem, Co-CEO of Investcorp stressed that the GCC offers what many other emerging markets don't offer: ***High risk-adjusted returns due to stability, dollar peg, and vision.*** Few countries in the world actually have certain business plan he said. In the GCC, we "invest in the Vision." As an example he noted the average growth of his Saudi businesses in 2018 is 28%, with margins of 15%. Ben-Gacem is doubling investments in MENA including a billion in infrastructure.

The MENA region offers a unique economic stabilizer: Islamic Finance: The MENA region has the highest concentration of Islamic Finance of any region in the world, its national economies enjoy the risk adverse attributes of Shariah compliant banking and transactions, including prohibitive activities such as speculation, etc. (See Figure 2).




*(Figure 2) Courtesy: Milken Institute*

Economies with significant Islamic Banking systems better weather global contagion, academic evidence suggests.

## Panel: 50 Ways to Leave Your LIBOR Creating Alternative Benchmarks

More than $300 trillion in financial contracts—loans, mortgages, securitizations, derivatives, etc.—are tied to LIBOR, which is scheduled to end in 2021. Alternative benchmark rates such as SOFR (Secured Overnight Financing Rate) and Ameribor (American Interbank Offered Rate) have begun to operate, but significant transition challenges remain.

**HISTORY:** LIBOR's going away at the end of 2021. Richard Sander, Chairman and of the American Financial Exchange, is considered the "Father of Financial Futures." Asked to give a history of LIBOR, he explained:

"It's really a historical accident. In the late 60s, a group of European banks decided to issue floating rate notes. They wanted to make sure that if [rates] moved up, they could adjust the terms of the loans. They went to the Shah of Iran, and said, "We want to finance you, and we're going to do it on a floating rate basis." Then they said to each other, how do we ***fix*** an increase? ***Fix is the key word***. They agreed to call each other, and there was the birth of 350 trillion of derivatives." They meet to fix (set the rate every day.) Rate volatility and rising interest rates in the early 70s caused the [LIBOR] rate to become ubiquitous as banks needed variable rate assets.

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**2008 CRISIS:** Asked about the 2008 crisis aftermath, Scott O'Malia, CEO of ISDA, the International Swaps and Derivatives Association, and former CFTC Commissioner explained: "At the CFTC, there was concern during the financial crisis why LIBOR was so low. If bank credit is such a problem right now, and they're not lending, how is the rate remaining so low? The CFTC staff began to investigate, in around 2008, 2009, and collaborated with the FCA in the UK. They unpacked tapes and recordings and emails and chats that exposed manipulative behavior."

O'Malia said: "In 2010 we issued an order to all the 16 banks, saying we need to audit your process for this. Even then, ***during that time the banks were still continuing to submit faulty prices, even though they were under investigation which is quite remarkable***."

In 2012, those investigations resulted in new rules, multi-billion fines, and people went to jail for collaborating with colleagues across other banks to fix the LIBOR in a manipulative behavior in several currencies and in several jurisdictions. So this was a global problem. It was clear we needed a new transaction based system that is, an observable and transparent process in order to make sure that we have a good, robust LIBOR rate setting process.

**SOFR:** Brian Quintenz, current Commissioner at the CFTC, added: The New York Fed created the Alternative Reference Committee (ARRC.) SOFR (Secured Overnight Financing Rate) is based on overnight Treasury Secured repurchase agreements. In 2017, ARRC committed to develop and implement plan for SOFR cash and derivatives markets. Now LIBOR trades $500 million a day, compared to one $Trillion for SOFR. A risk posed during the transition is payments on over $200 Trillion dollars' worth of liabilities are still calculated on only $500 million of trade value a day; an upside-down pyramid!

**AMERIBOR**: Asked how his benchmark works, Sandor commented: “We set out with a different track. I'm 700 years old {laughter} so I've been knocking around the futures business for a long time. The first thing you need is a viable cash market. There's no way you can start a futures or a derivative without a viable cash market.

“So we said, let's focus on the 5,364 banks in the United States and leave the 10 big ones out of it.” We visited 125 small banks, regionals, mid-size, and communities. They have about Nine and a half Trillion dollars in assets, and about half of them are floating rate.”

Sandor offers multiple benchmarks. “Our theory was the best thing was to have choice, because different overnight unsecured rate benchmarks would fit bank’s needs better.”

Sandor continued: “Around the country. We built up consensus, and we spent four years researching. We patented a weighted average based upon transparency and {started} a self-regulatory organization, {to} make sure there were no spoofings. We built a 150 page rule book, and launched in December with four banks at the opening, and none of them had credit lines with each other. The big problem was, even though we had the biggest bank in Wisconsin, the biggest bank in Indiana, they had no credit lines. So the big challenge was to get a network of new credit established.”

Sandor started with 13 million dollars a day and four banks and now has 118 regional mid-size community banks, and 557 communities through a correspondent program. So we have about 700 banks that are members. We went from 13 million a day to last year 72, and traded 300 million a day, and we're up to a billion eight a day now. The average of those on a daily basis is AMERIBOR.”

“We have now recruited non-banks. Deere just joined. Cerberus, a non-bank financing firm, just joined. Jefferies, insurance companies, {etc.} so we have 26 non-banks.”

Sandor continued: “We're finding a big interest in the corporate C suites because they price commercial paper off LIBOR, and they're very nervous about doing it. They're also nervous that once their debt gets placed, they wonder what the implications of swapping it into a different rate, and if a different rate is no good, they get potentially embarrassed because it still sits as their name on it, and they are taking a big interest in the replacement. We think that's healthy. We should have corporate America, not the financial sector, being involved in decisions about benchmarks.”

Sandor stressed market development is a decade long process: “So we started out in '11. We built a cash market and built consensus among all of these banks…The American economy is rolling regional GDP, so we had to populate and be in all 50 states so that we could homogenize regional rate differences to come up with a national rate, AMERIBOR, which reflected unsecured borrowing costs.” Unsecured structure is attractive to its members because it helps index yield on borrowing and lending that reflects more vanilla banking activities like underwriting auto loans and corporate loans. SOFR is great for the major institutions, for leveraged loans, “but you got 5,000 banks out there that don't know what a repo is, with nine trillion in assets.”

The regional banks “disproportionately fund small businesses and create new jobs. The small and medium size banks really are the economic backbone, and they'll lend to the dairy farmer in Wisconsin or to a car dealer in Tennessee, or to a feeder company for Walmart and Bentonville.

## Panel: Driving Shared Prosperity

How do we best ensure that our citizens have the tools and training to capture today's economic opportunities, and to forge a thriving society for future generations?


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The panel focused on paving pathways for both early and late-career workers into high demand jobs that don't necessarily require an expensive education. Blue-collar trades currently have more openings than available workers. Former Google CEO Eric Schmidt opened the panel asking: "Why can't I find an electrician?"

Ivanka Trump, Advisor to the President, The White House and Co-Chair of the American Workforce Policy Advisory Board, has been working to re-orient the resources of the federal government from subsidizing four-year college degrees toward career and technical education.

Trump remarked: "Education and learning need to be rebranded. This idea that to achieve the American dream you need a four-year degree is so steeped in American education that it’s taking people away from very viable career pathways."

Trump also talked about her efforts to expand job opportunities and apprenticeships stating “200 plus companies have Pledged 7.3 Million new opportunities for career enhancement, on-the-job training & apprenticeships.” The apprenticeships are for young workers as well as re-skilling programs for their longer-term employees.

The panel supported the rise of flexible work opportunities, such as EY's GigNow platform, which the company uses to outsource short-term tasks. "There are people who would like to work but can't work in a traditional structure for a number of reasons," Schmidt said.

**Labor Participation:** Noteworthy is the challenge the country faces due to chronic labor non-participation, a problem exacerbated by an opioid epidemic. For further reference on labor participation, see author's 2017 RedChip Special Report.[4]

## Investing with Vision: A Conversation With SoftBank's Rajeev Misra

Michael Milken, Chairman of the Milken Institute, sat down with Rajeev Misra for an onstage conversation. Misra heads Softbank's Vision Fund, the world's largest venture capital pool.

Milken asked Misra about SoftBank's process for deciding which companies are worthy of investment. Misra observed that key attributes include a strong platform, and an ability to work in tandem with the Vision Fund's other existing investments.


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Misra, the head of SoftBank Group's $100 billion Vision Fund said he intends to soon launch a similar investment vehicle. The Fund backs tech startups engaged in business collaboration and cross-border expansion. The second fund is still in the concept stage but will be "the same size" as the Vision Fund.

The Vision Fund portfolio includes 80 companies that have received about $80 billion in funding, says Misra.

SoftBank's intends to double its investing staff from 400 to 800, and it may raise a second investment vehicle that will be "the same size" as its $100 billion Vision Fund. "We will hopefully start raising our

second fund in the next few months," Misra said. The fund is not only focused on searching for new deals, but also actively trying to grow companies it has already invested in.

Indian budget hotel operator Oyo is preparing a big Japan push and has announced the creation of a joint venture with SoftBank. The Vision Fund is also assisting Oyo's entry into the U.S.

The fund and the Toyota Motor group have decided to jointly invest $1 billion in Uber Technologies' autonomous-vehicle unit. The Vision Fund is the largest shareholder in Uber ahead of its initial public offering. "What is the biggest cost of ride-sharing?" Misra pondered. "It is the driver. Autonomous helps." The goal is to introduce autonomous driving to turn the operations profitable. [Update: Uber had an unsuccessful IPO two weeks after the conference.]

Misra said his portfolio companies, which include DoorDash and Uber, have added about 10,000 jobs in the US. He also highlighted the fund's geographical diversity — only 45% to 50% of the companies are American.

With $35 billion in the U.S., The Vision Fund is the largest foreign investor to the US.

## Invest in Platform Companies:

Milken asked Misra's for more specifics on his investment selection process. Misra described the Vision Fund as industry agnostic and defined its ***general hypothesis as "meeting demand with supply in situations where each individual supplier can't invest in technology."***

The fund supports promising businesses that can't achieve proper scale themselves.

"Platforms can invest in technology, can get the scale, and can get smarter with data over time and make decisions of pricing dynamically and providing quality," Misra said.

He continued: "It's across many industries, and the fundamental theme is that they're matching granular suppliers of products that are too small to have the scale and capital to invest in technology."

## Disruption and Synergies:

Misra seeks "Disruption" in every investment he makes, whether it's Automation Anywhere disrupting robotic process automation or Oyo disrupting the hospitality industry. But that's just the beginning. **Misra is keenly aware of how new entries into the portfolio will enhance existing holdings and get a boost themselves from the fund's infrastructure.**

"We invest in companies that, on a standalone basis, are great investments. But put together with our other 79 companies, there's additional synergies."

As an example, he told the audience about Cambridge Telematics, which received a $500 million injection from the Vision Fund back in December. Before the investment, the company already had a safe-driving platform with 4 million users and had 16 insurance companies as customers. It was already profitable.

Why were there common interests between Cambridge's platform and SoftBank's money? Because of the synergies, he pointed out; Softbank had more to offer than money.

"Our portfolio companies control the largest number of drivers in the world. We have four companies that control 90% of ride-sharing globally."

### The Transformative CEO:

Misra stressed: “No company could be truly great without a transformative leader at the helm.” In disruptive industry, “the CEO is critical in many ways.”

The attributes Misra values include: 1) Humility — "You have to make mistakes and learn. Arrogance is when it derails." 2) The ability to attract talent — "The biggest problem with our 80 companies is not financial capital. They have money. It's human capital." 3) Fearlessness — "It's a complete belief they're going to win."

Companies SoftBank invests into have regular meetings with Misra and his colleagues every six to eight weeks.

Misra also said he pushed his portfolio companies to grow faster than they could ever imagine. “Think big. We amplify their vision.”

# Part II: Technology and Innovation

# 5G: A Tech Revolution With National Security Implications

5G networks and their revolutionary data-transfer speeds will enable major advances in artificial intelligence, remote control of robots and cars, and an exponential increase in the connectivity among the Internet of Things. Chinese companies offer the most affordable equipment to power 5G, giving them control of global data.


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Moderator David Sanger, National Security Correspondent, The New York Times, opened the discussion by asking Jason Hoffman, Chairman, MobiledgeX, to explain 5G:

"In the case of 4G, we have these supercomputers in our pockets; the types of ***devices we still use by ourselves***…for like selfies, and pictures. They are windows to the world."

"Architectural features of 5G handle many different types of devices other than a smartphone," that have a common identity, and a common backend in a ***"collaborative social type of engagement around these devices."***

## Timeline and Costs:

Governments are allotting and selling their spectrum. Whose networks are going to win out and what countries are going to manufacture them, will "play out in the next 18 to 24 months," says Hoffman.

"Between 2009 and 2019, roughly $2.5 trillion dollars was spent globally rolling out 4G. 5G, standards get set by 2020. U.S., Europe, Japan, Korea, China, will largely be 5G by 2022; Estimates [forecast] that $3.8 to $5 trillion will be spent for the 5G roll out."

## Applications:

5G technologies enable devices to impact more industries including, healthcare, supply chain, logistics, and every other industry.

Asked non-cell phone applications of 5G, Vijay Doradla, Chief Business Officer, SparkCognition, explained: **"**Over the last decade, the digital economy has grown two and a half times faster than the global GDP. 4.4% of the global GDP is tied up with mobile services and applications. From 2016 to 2022, the amount of traffic on the network is forecasted to increase 10 times. We're at the early stages."

"Look at the convergence of the cloud, mobile network, connectivity, E-commerce, and social media. There's been an explosion in terms of new business models, which in many cases are asset-free," such as ridesharing market.

Also, "connectivity between the manufacturing line and the hub of the manufacturing facility using 5G exponentially increases, which translates into the ability to convert and repurpose a manufacturing line in a matter of hours."

## What are the National Security Risks?

Zvi Marom, CEO, BATM Advanced Communications Ltd. explained there are two keywords, 1) "**More**", and 2) "**Everything Internet.**" More applications, like autonomous flying drones (that need redundancy), precision agriculture, et cetera. It's not about mobile phones, but the second key word is the one. "Everything will be internet, ***everything. It means that whoever controls the internet or the ecosystem around the internet, controls the world of communication,"*** he emphasized.

**The Chinese:**

Marom explained: The Chinese are doing two things. **1)** ***Huawei, ZTE and other Chinese companies***, "**design** ***all their equipment so they are looking on the data stream and storage," for espionage purposes.***

Marom then cautioned: **2)** "***Far more dangerous. They put small dangerous midgets [sic] inside their equipment that can be called in time of conflicts, and will paralyze your equipment, to collapse your communication system. They can do it. Any Huawei or ZTE based network," can stop working, creating "danger to national security and to commercial networks.***"

## The Network Market and Industry:

Switching capability in 5G is mostly software. Also, the mobile (radio) part beams out from the towers to our mobile devices. E.g. Chinese makers, control half of the radio connection of the network in Germany.

Hoffman cautioned: "***Even if the equipment is cheaper, operating under those risk profiles is not right. You can make different procurement decisions. The U.S. is still at least a decent provider of base components***, many of the chips are still made by companies like Intel, as are the FPGA's, software components, and architecture parts. **What we've given up in this country is taking these parts and going up into full blown solutions that get operated and rolled out.**"

## Business and Financing of 5G:

Asked to comment on the capital markets, Doradla said: "In 5G: three of the five global players are Asian suppliers out of Huawei, ZTE, Samsung, Ericsson and Nokia."

For 4G, "there were 16 suppliers. The storied Lucent (Bell Labs), with nine Noble Prizes, the transistor, etc. essentially disappeared, replaced with Asian suppliers." Huawei's revenue this last year was $100 billion.

"How do you keep a competitive edge when you're in a capitalistic society, in a competitive environment, versus [an opponent that has] an unlimited balance sheet to build their technology? Would Huawei have survived if it was outside of China? No VC would have funded Huawei," he said.

## The U.S. Government Response:

Sanger noted: The Secretary of State, National Security Advisor, and Vice President are traveling the world, in Europe and parts of the Middle East, and they have one message***: "If you go with a Chinese design network, a Huawei design network instead of the Ericsson or Nokia, or even***

***Samsung, we're going to cut off your intelligence because we can't guarantee that the communications will be secure.***"

Asked if the threat is believable, Marom said: "If we look on companies like Huawei, basically they started by copying the Cisco Equipment, including the protocol, including the software, including doing reverse engineering and so on. There is no way any company in the Western world can compete when the government of China provides endless funding."

"Lots of know how that has been stolen. So in that aspect, the American government is 100% right. China and Huawei are too big to avoid. But they can be contained by threatening the Chinese that unless they will stop it, they will pay dearly, financially," and will be excluded from Western Society. "Huawei payed [fines] in the billions for what they did to Cisco. They are a threat to our way of life, not just a simple commercial threat. And in Israel, we take it very seriously. **We looked on the Huawei equipment to the level of every single chip there and what we found is not very pleasant.** I am limited in what I can tell."

Marom emphasized: "**This is not commercial company stuff. This is nearly military grade stuff.** To understand what the value proposal of Huawei is, 'they provide phones, infrastructure, and cheap financing. Five years later, you wake up."

**Chinese Investment in 5G and STEM:**

Doradia observed: "The question is the trajectory of where we're going. As 5G and artificial intelligence comes into the network, the implications could be staggering. In 2017, China spent $12 billion on AI and is expected to spend $70 billion by 2025. The number of research papers with citations from China is significantly higher than the U.S. in AI."

Look at the STEM. "In 2016, the World Economic Forum said that there were 4.76 million STEM graduates in China. India had 2.2 million, and the U.S. had 568,000."

Hoffman remarked, "5G networks are designed by people that have PhDs in the subject. Of the top 20 universities in the space, 13 of the top 20 are in China and Hong Kong. There is one in Sweden; KTH. In America, only two: University of Texas, Austin and Georgia Tech." Adjusting for populations doesn't explain the disparity. "Of the top 20 universities, KTH and the two U.S. schools generate 80 PhDs in a year in the subject, and China's graduates 7,000."

This brings us to our next panel, focusing on STEM.

## Panel: The American Workforce (…and STEM)

It is no secret that the United States has a workforce-development challenge. Human capital is the most important intangible asset, yet parts of the American labor force face's challenges amid structural changes in the economy.

Panelists agree that STEM (Science, Technology, Engineering and Math) is critical in an information economy.

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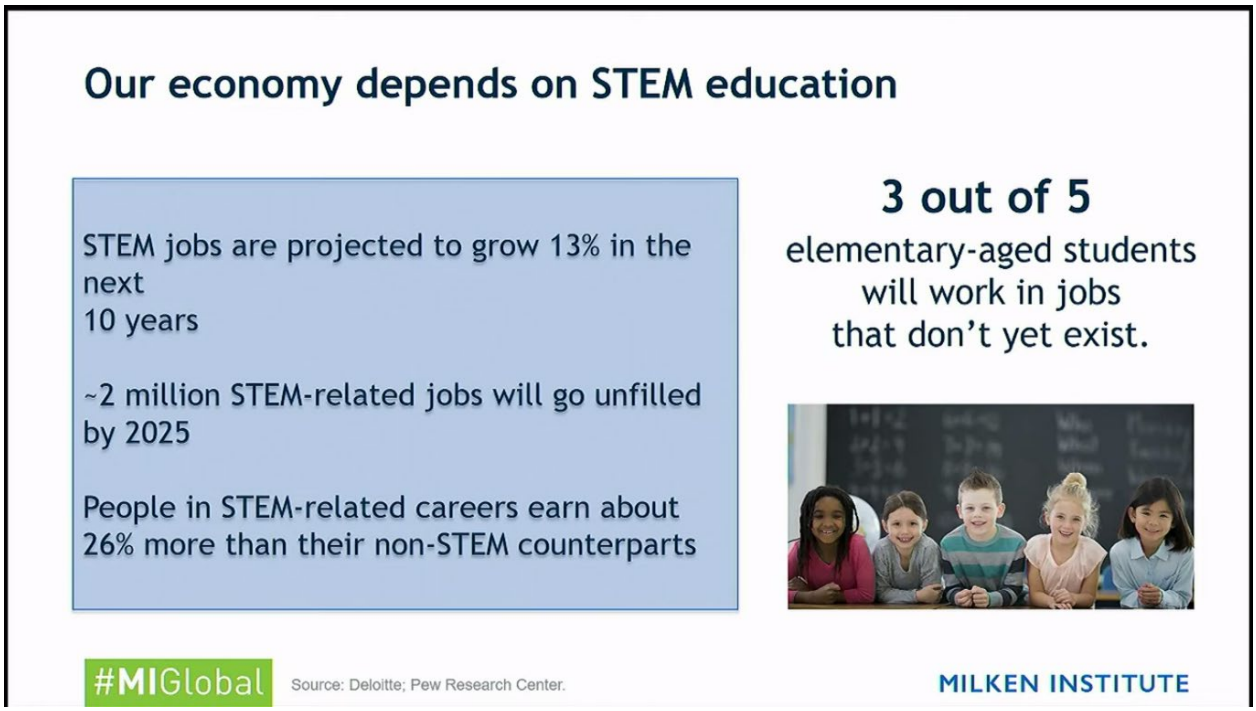
Dr. Bernard Harris, CEO of National Math and Science Initiative (NMSI), a former astronaut, explained NMSI is focused on the need to improve math and science skills at the school and educational level. Harris observed: The workforce is "will be going into jobs that require math and science education, and training. Whether they go to college, or whether they go into vocational schools." In these fields, "it's going to grow about 13% a year (***See figure 3 below***). There are going to be two million jobs that, within six years, are going require STEM. That means that we have a lot of work to do."




*(Figure 3) Courtesy: Milken Institute*

NMSI supports schools, teachers and students across the country with leadership training, teacher professional development, classroom and lab supplies, AP® exam subsidies and expert-led study resources for students.

"The STEM workforce continues to outpace other sectors and **many students today are likely to work in jobs that don't yet exist**," Harris said. "**It's about creating a workforce of knowledgeable individuals who will drive economic prosperity, compete globally** and actively participate in the growth of this nation."

## Immigration:

One way in which the US has traditionally filled a lot of its skills gaps is through immigration. U.S. Secretary of Commerce Wilbur Ross stated: “The administration is not against immigration, it's for lawful immigration, especially of those who have skillsets. We would like to see something change at the graduate level, we're deporting people that we have paid to educate with STEM knowledge that we desperately need. Yet, under the present system, we deport them so that we can import the products.”

Ross says the Administration likes the Canadian and Australian system, where it's more merit based, not lottery based.

## Panel: AI's Next Chapters: What to Expect from a Transformative Technology

The panel gathered at this year’s Milken Institute contained some of the world’s most notable CEO’s and Directors who are inventing and constructing Artificial Intelligence systems and software. The systems being designed have far reaching aspirations for the technology from business application to multilateral applications used in world-wide supervisorial and warning.

**Business Application**

The business applications for Artificial Intelligence were represented by Erkin Adylov, Founder of Behavox and Vijay Doradle, Chief Business Officer of SparkCognition with the latter aiming to build systems covering the Transportation and Energy sector. The systems will allow for intelligent aviation systems and energy generation; thereby, allowing the optimization of safety and efficiency. Behavox not happy with the mundane utility of engineering, is focusing on internal business communication monitoring internal employee communication interactions. Apparently, AI really understands why “grumpy cat” is so darn popular with those kids.


WATCH VIDEO

**World Problems**

**Health**

Mark Johnson, Co-Founder of Descart Labs intends on leveraging vast amounts of climate data to predict climate change and applying it to the global problems of energy and agriculture and their cross correlation with human health and welfare.

James Golden, CEO of WorldQuant Predictive, explained his firm will mine local social media data for deterministic action on possible suicide prevention of affected veterans coming home from war.

**Communication**

Golden of WorldQuant and Robert Kirkpatrick, Director of UN Global Pulse, expressed desire to monitor interpersonal communication from social media and cell phone use to determine human interactions and movement. These communications actively gathered from spoken media or human ephemeris data, gathered from cell phone towers, will allow for precise monitoring of human movement. The data gathered will allow for the correlation of movement and human interaction to determine when communities are in distress.

**Commerce**

WorldQuant Predictive is apparently looking to discover the butterfly effect of commerce. CEO Golden gave the example: “Mothers …buy this kind of baby formula over this kind of baby formula.
..But you can also take that data and look across the world at what else that data might be a proxy for.” Thus, the rippling effect on sales of baby formula may help to determine the move to when you might need help or need another set of tractor tires. One wonders if this may in fact be Adam Smith’s new bionic appendage manipulated by our cyborg masters!

**Development**

WorldQuant Predictive intends to use AI to allow the use technology to “leapfrog” economic development from current levels to much higher levels of output. Apparently, AI will solve all the infrastructure, education, governmental needs of a developing country freeing the occupants to codenew websites and thus save humanity from its pressing problems in getting a quality hot pastramis sent to your door!

**Data Pool**

UN Global Pulse’s Kirkpatrick is calling for “data philanthropy” where all data sources are gathered together and linked in a cost free clearinghouse. Apparently, all competitors are going to gather and share intellectual data; then, the low end generator of that data will now expand their opportunity to mine and use this data for their business.

The proposals of the quasi-governmental AI fail to determine realistic moral guidelines for data and who is the arbiter of these rules. There is an implied theme of the speakers that the producers and consumers of the data will use a free consensus for proper use. Last century is riddled with plenty of examples where free consensus was employed and the results were spectacular and disastrous.

**Work**

Using automated systems and drones to replace humans for labor and in both the developing and developed world could have major disruption. Additionally, white collar jobs such as doctors, lawyers and engineers will more prominently feel its effect.

On a related panel on AI ethics, Vivienne Ming, Co-Founder of Socos Labs, explained that one AI program at Columbia University included a team of lawyers challenging a computer AI system to search through legal contracts and identify the loopholes. The AI program “found 95% of loopholes, the humans found 88%.” But the real tale-of-the-tape was, the “humans took 90 minutes to read a contract and the AI took 22 seconds!” This removes the need for lawyers for such a task. Not many would find this objectionable! For those interested, the video link for that panel is: https://www.youtube.com/watch?time_continue=238&v=hDyxQ6865d4&feature=emb_logo

**Summary**

This presentation is very important to understand where Artificial Intelligence is finding application. The presentation is thought provoking, startling and engaging and should be viewed by everyone to discover what’s coming next.

# Pushing the Boundaries of the Final Frontier: Space

Space travel was once nothing more than a dream. Today, dozens of astronauts explore in and around Earth's orbit every year. Space is also becoming the next frontier in closing the gender gap and is the latest sector to experience significant business development and investment. What is it like to travel to space? What is the future of space travel? And how far off are we from vacations to the moon and beyond? “

Moderator Anousheh Ansari is CEO of XPRIZE, the third of four companies she built sold for 1.3 billion dollars. She funded the first Xprize, then flew the Soyuz privately to spend 11 days on the Space Station.

Ansari asked: How does your work expand the horizon for us in the final frontiers of space?

**Space Economic Opportunities**

Peter Diamandis, Founder and Executive Chairman, XPRIZE Foundation responded: Exponential Technologies are enabling small teams to do what was only possible by governments and larger groups before. Individuals can now actually capitalize and fund these efforts themselves.

There's more Venture Capital than ever in human history. In 2017 we hit all- time highs in VC, crowd funding, sovereign wealth investments. And then all- time highs again in 2018. And we'll probably hit all-time highs again in 2019. We’ve seen the emergence of Virgin Galactic, of SpaceX, of Blue Origin. There are on the order of six venture-backed small launcher companies. That's crazy.

Ansari injected: Yeah --- I knew the times have changed when I got an invitation to go to a Goldman Sachs space investment conference,

Diamandis added: Relative to Xprize, I was just on the phone with Ca. Governor Newsom about creating a fire detection and extinction Xprize: Can you detect it from space or from drones and then, within 10 minutes, put it out, before it spreads?

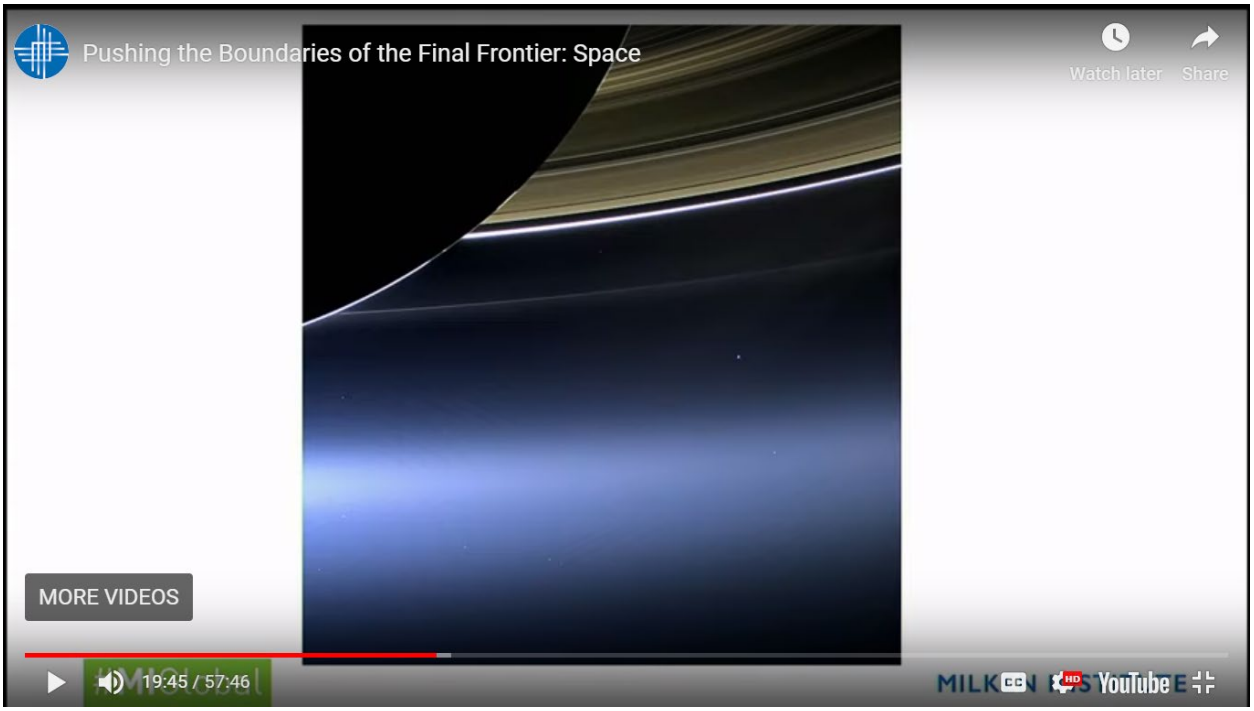
Diamandis projected: You're going to see the communications business continue to be a key economic driver for most of space. There will be an explosion of a multitude of 20,000 – 30,000 new orbital systems satellites which will exacerbate the orbital debris problem but at the same time generate demand for boosters and laser communication systems. We have Starlink from SpaceX, we've got One Web from Greg Wyler, we've got Jeff Bezos' Kuiper program

WATCH VIDEO

**Space Education and Medical Challenges**

Dr. Bernard Harris, Jr., CEO, National Math and Science Initiative, Medical Doctor, Former NASA Astronaut and veteran of two space missions, a crew medical officer, a payload commander, and a spacewalk injected: I've been a big advocate for making sure that our kids have the tools that's necessary for them to fulfill their dreams. And I think that STEM education is the heart of everything we do. See “STEM panel” above.

***Figure 4*** below is a picture of planet Earth, that pale blue dot down there at the bottom, below the rings of Saturn. And we're about 900 million miles away. And so the things that we're talking about now is not only going to the moon, and going on to Mars, but perhaps even one day leaving the solar system.




*(Figure 4) Courtesy: Milken Institute* (Planet Earth as seen below the Rings of Saturn)

There are a lot of [medical] challenges to humans in space such as the acute effects of fluid shift, scotomas, and muscle and bone loss. Immediately when we get on orbit we experience the effects of fluid shift. As you get into microgravity, fluids shift from your lower extremities toward your head causing an astronaut to **get fullness of the face and those of us who have wrinkles, those wrinkles go away.** The body then sees it as a fluid overload and over time you will reduce your blood volume**. Your heart will shrink in size as your body senses a fluid overload, and you will develop atrophy. You will lose about one percent of bone per month.** And there are changes in the immune system. The NASA twin study [referring to astronaut Mark Kelly and his twin brother Scott who is married to Gabby Giffords] shows changes in the genetic system. So microgravity has a tremendous effect.

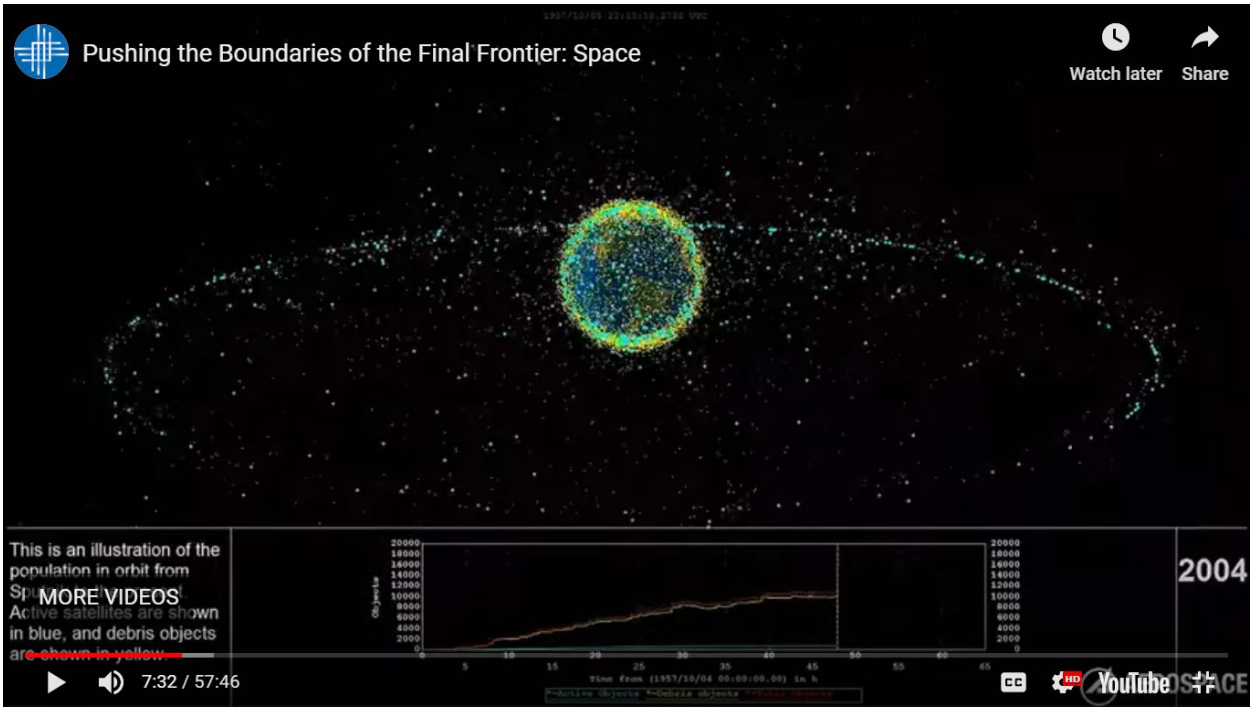
About 30% of the astronauts have [developed] holes in their visual fields **called scotomas.**

## Technology Advances and Space Debris

Steve Isakowitz, President and CEO, The Aerospace Corporation added: One of the hardest things a satellite has to do is point in the right direction and some of them were the size of a school bus. Today, we're actually building satellites, about the size from my elbow to my hand, that do the same thing. And they point with such accuracy that for the first time we're actually able to use laser communications, where you have these little cube sats that can point a laser to the ground and do high data rates, not only with the ground, but with each other.

Objects are creating a congestion problem in space. ***Figure 5*** below, is a simulation of the over 40,000 objects in space [depicted as dots], of satellites we have put in space since 1957 and debris. The beehive

of the greatest amount of activity is those satellites that are closest to Earth, which is where we have our astronauts and our space station. The outer most ring is geosynchronous satellites.




*(Figure 5) Courtesy: Milken Institute* Orbiting Space Objects

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**Youth Opportunity**

Leland Melvin, Former NFL Football Player, NASA Astronaut and Author of "Chasing Space: An Astronaut's Story of Grit, Grace, and Second Chances" expanded: I recalled the moment that blew my mind during my first mission in 2008: I'm flying over Lynchburg, Virginia, my home town. Five, seven minutes later we're flying over Paris and Leo Eyharts is looking down where his parents are probably breaking bread with some wine and cheese, and Yuri's looking off to Russia, maybe his parents are having borscht.

I remember when I first started giving public talks to kids about space, and I went into a classroom and I asked the kids in the class to raise their hands if they wanted to be an astronaut. And only the boys raised their hands. And I asked the girls, "Why didn't you raise your hands?" They said, "Well, you said it's for the manned space program and I'm not a man." So the language that we use is so important to ensure that our kids have these opportunities to see themselves as these space explorers.

And I'm working with an organization called Base 11, to have the equivalent of an Xprize to give students, a million dollars **if they can get to the Von Karman line with a liquid propelled rocket**.

**Space Tourism and Reusability**

George Whitesides, CEO of Virgin Galactic [Richard Branson's space company] observed: Only 571 individuals have been in space. We fit that many people on board an airbus 380. At Galactic we have more than that already signed up to fly. High schools are now building their own satellites. So people

can fly on a secondary ride to space and almost anyone now can get involved in space in a real way. He stressed: *The big revolution going on in space transportation is re-usability.*

## Panel: Things That Will Blow Your Mind

In our coverage of the popular annual "Things That Will Blow Your Mind" panel at Global Conference, three visionary entrepreneurs will let you in on their breakthrough technologies: From programming organisms, organic blockchains that verify global transactions, to a virtual-reality tour of the human brain, they will blow your mind!

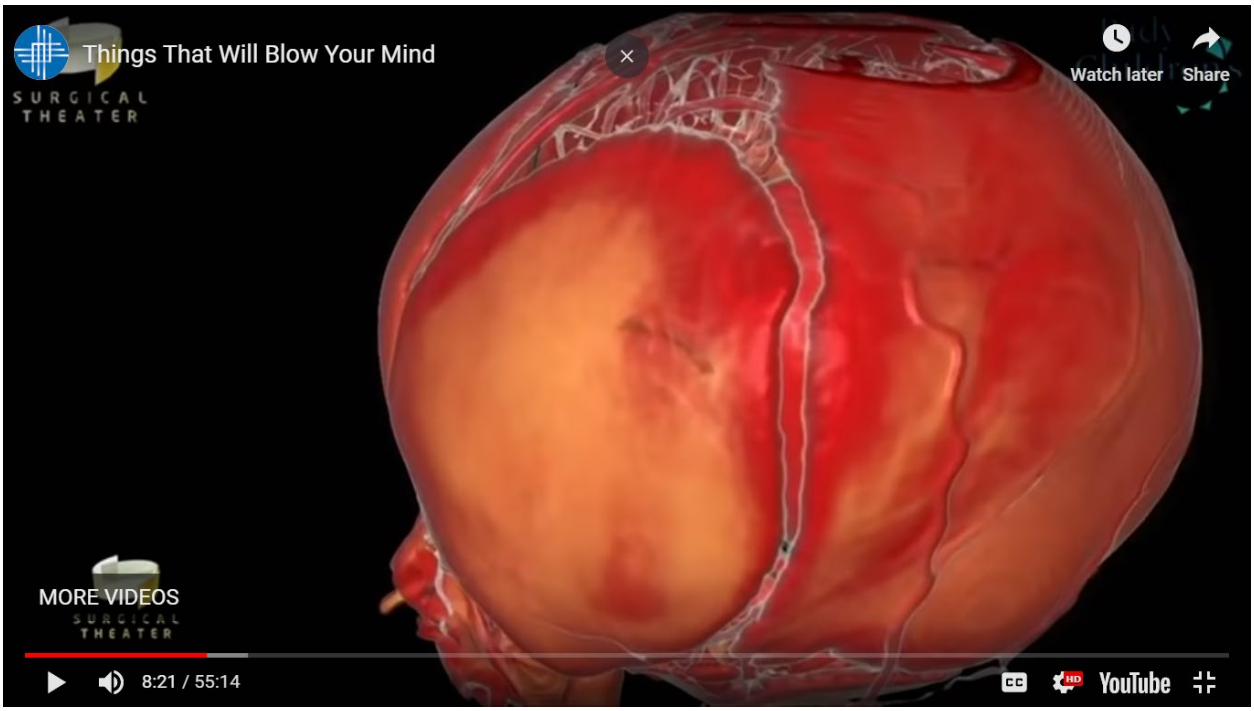
Moderator, Richard Sandler, Executive Vice President, Milken Family Foundation, asked Modi Avisar, CEO and Co-founder of the Surgical Theater, "Tell us about your work at the Surgical Theater."

### Surgical Theater

Avisar: We've developed the equivalent of a flight simulator for surgeons where we process MRI and CT scan data into a system that allows surgeons to do pre-surgical simulations. They can "fly" in behind a patient's tumor and see the vessel behind his back. This enables them to help identify the best surgical modality, confirm the need for surgery, and circumvent potential threats all of which leads to improved surgical success rates.

Avisar then described the work of Dr. Michael Levy, UCSD Professor and Division Head of Pediatric Neurosurgery at Rady Children's Hospital of San Diego, that demonstrates one of his cases using Surgical Theater technology where a 32 week term baby had excessive blood around his brain. Dr. Levy explained his experience with the technology.

Dr. Levy: We're looking at the baby's skull ***Figure 6*** (below) and you can see the skull overlaying the aneurysms. We found, after dozens of simulations using the Surgical Theater software ***Figure 7*** (below) that we needed to change our approach to surgery to preclude the need to mobilize the aneurysm at all and this led to a successful surgery. Were we to have mobilized the aneurysm and got intraoperative bleeding, the child wouldn't have survived. If I didn't have the 3D visualization and relationships that were available with the technology it could've been disastrous.




*(Figure 6) Courtesy: Milken Institute* Baby's scull overlaying the aneurism

**WATCH VIDEO**


*(Figure 7)* Dr. Levy practicing surgical procedure with 3D virtual reality headset

Avisar: I am going to tell you about a second case: A young, 30 year old, one day realized that he can't feel his legs, and within days he became a cripple on a wheelchair and this guy was playing professional sports. And he goes to multiple hospitals and nobody wants to operate on him because they can't get to the pathology without touching the nerves. The surgeons had a legitimate concern that they may kill him if they operate. Long story short, this individual found himself in NYU consulting with a surgeon that had our technology and he showed him the simulator and how you can "fly" very delicately between the nerves and remove this pathology. Every nerve is a half millimeter. This individual went into NYU in a wheelchair, after five or six days he walked out.

Avisar: Regarding commercialization of Surgical Theater --- Studies have shown that hospitals that deploy our virtual reality Surgical Theater are more likely to increase the capture rate of new patients from 50% to 80 to 90%.

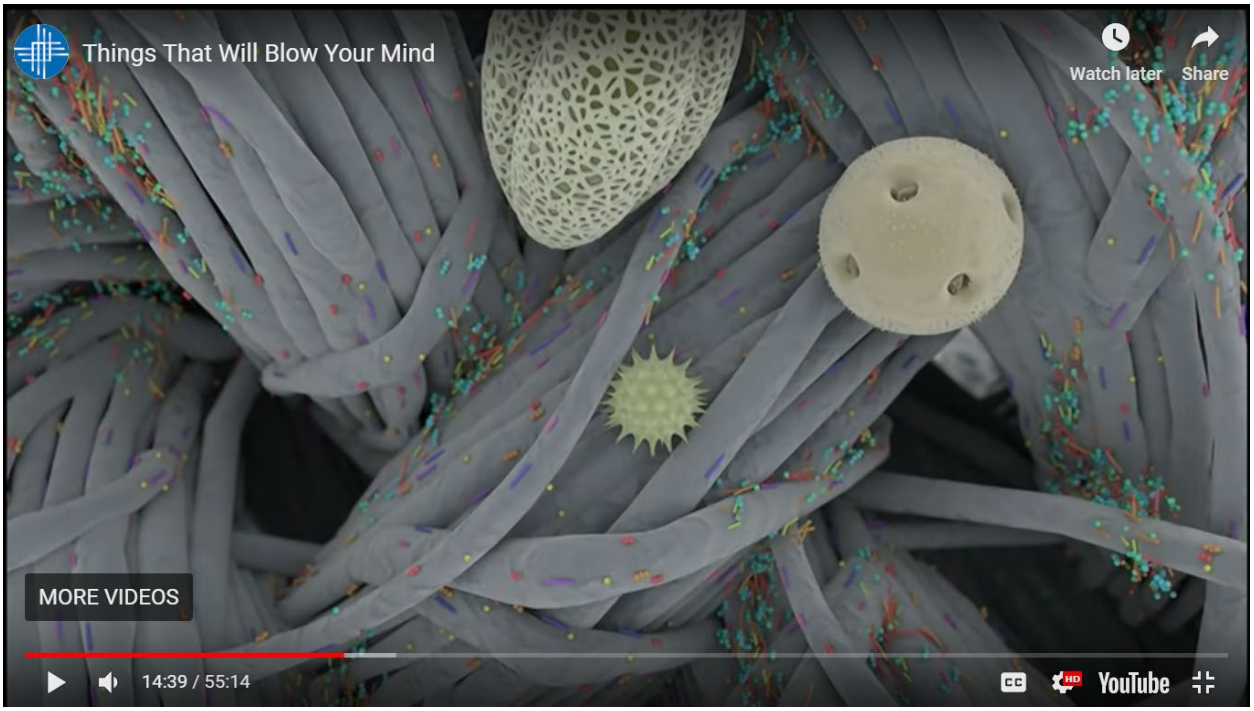
Moderator Sandler asked Dr. Jessica Green: Tell us what you're doing with Phylagen with respect to the 99% of life forms that we actually cannot see.

## Phylagen

Dr Jessica Green, the CEO and co-founder of Phylagen Inc. explained:
We're a venture backed company based in Silicon Valley. We just closed a $14,000,000 series A financing. I'm going to talk about the environmental microbiome, which is the collection of microorganisms everywhere on Earth that are outside of the human body.

You can think of the microbiome as a naturally occurring RFID (Radio Frequency Identification) tag.

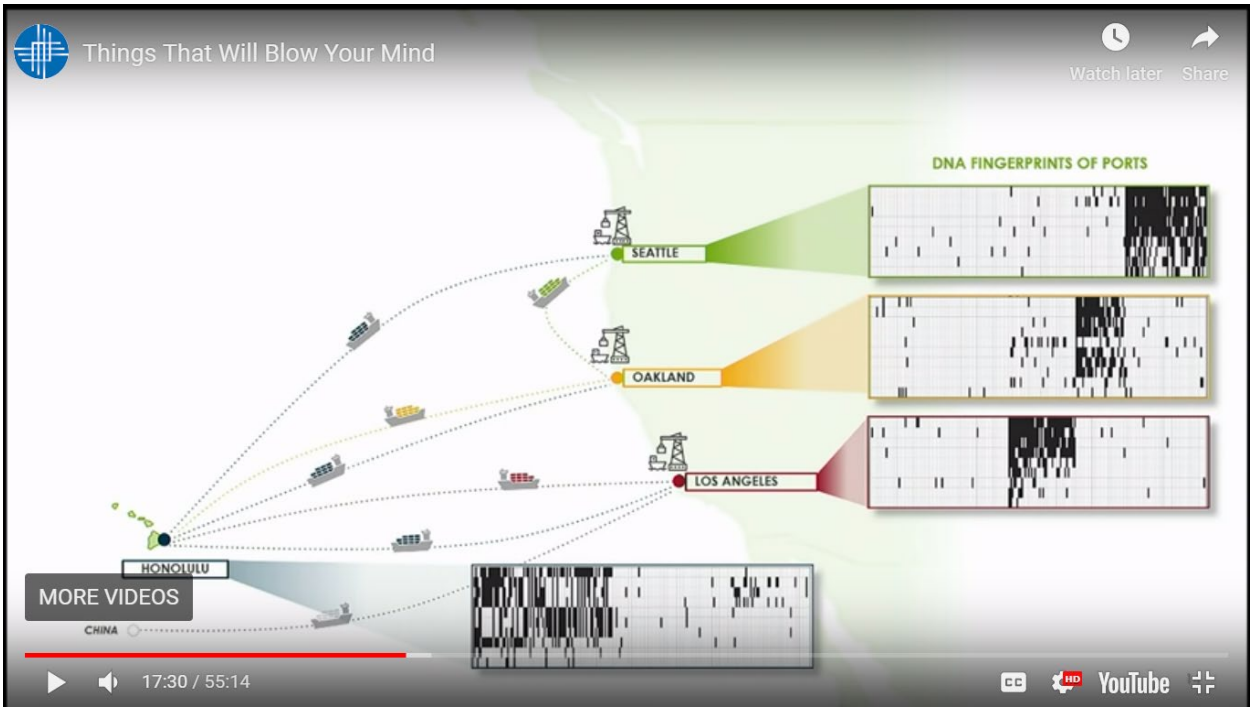
Every inch of the planet is covered with invisible life forms. See ***Figure 8*** below.




*(Figure 8) Courtesy: Milken Institute* Invisible Life Forms – bacteria, fungi, virus

and it's become incredibly cheap to sequence the DNA of microbes. What we've learned is that different places have unique genetic signatures. Really any environment has distinct DNA barcodes.

This caught the attention of DARPA who wanted to know if you could use the microbiome to track how ships move around the world. Apparently it's not that challenging to falsify a shipping log and this poses a threat to national security. So we conducted this work and what we found was remarkable. In ports around the world we did indeed find that ports have unique genetic signatures (see ***Figure 9*** below).




*(Figure 9) Courtesy: Milken Institute* DNA Fingerprint of Ports

Every port has a unique DNA fingerprint which we call postage stamps. Every row in one of these fingerprints is a dust sample and every black line represents a type of microorganism that is in that port. And what you can see is that you have different microbial communities at different ports.

We have found is that even boats that are traveling up to seven days across the ocean carry the microbes from that port and if you sample a boat on the gangway, you can then predict what port that boat was at most recently.

We are also involved in microbiom studies for other uses. To name a few --- food traceability, air quality, infectious disease, crop performance, antibiotic resistance, drug discovery and the identification and origin of counterfeit products.

The moderator asked Dr. Jason Kelly, the CEO and co-founder of Ginkgo Bioworks: You're also working with molecules and microbes, and so tell us what's going on at Ginkgo Bioworks.

## Ginkgo Bioworks

Dr Kelly: Synthetic Biology has caught the attention of venture capital because technology is increasing exponentially (***Figure 10*** below) and costs are decreasing faster than Moore's law (***Figure 11*** below) which accelerates applications.


(*Figure 10) Courtesy: Milken Institute* Funding for Synthetic Biology Companies

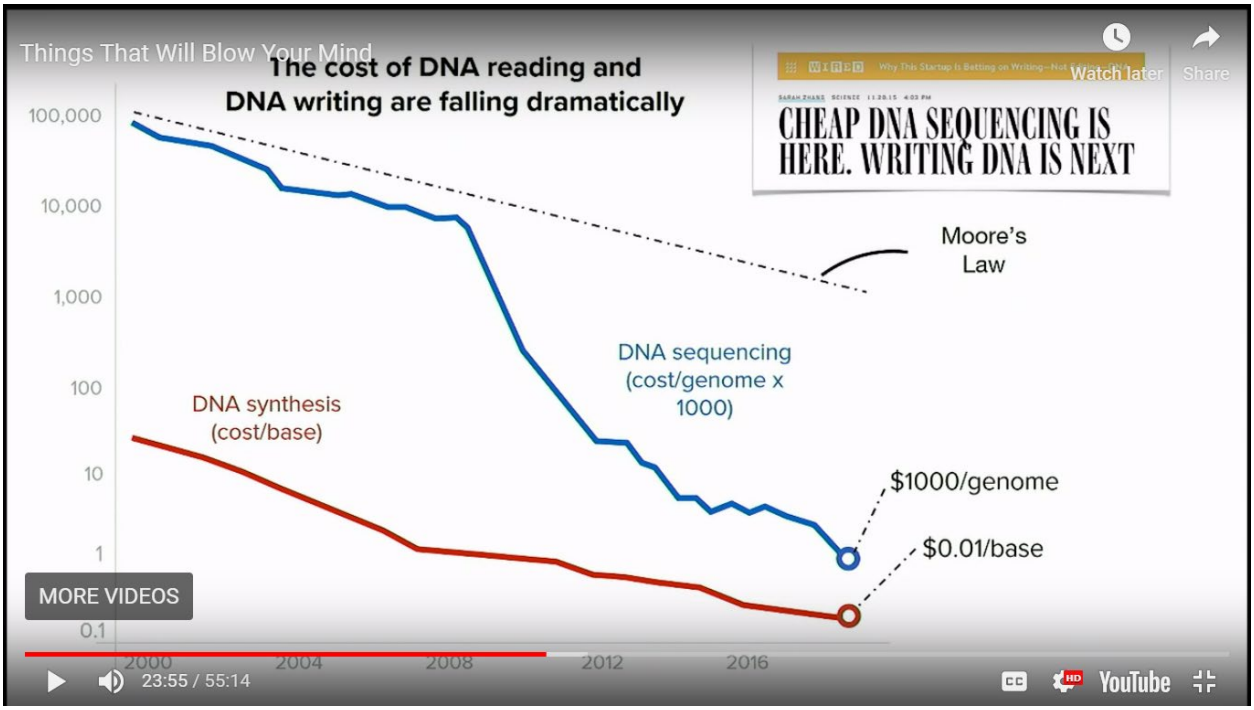
**Technology is improving exponentially**

Biology or cells are fundamentally programmable and that's because they run on digital code in the form of DNA. Synthetic technology builds the tools to program cells and deploy them across markets.

It's not zeros and ones, it’s codes of ATs, Cs and Gs. We can program the code by reading the code with DNA sequencing, and writing it with DNA printing. And CRISPR, a little machine that reads that code and executes functions, now allows us to choose a location on the genome, open it and then insert DNA or make a change in that location

**Costs are falling faster than Moore’s law**

The cost to sequence a human genome in 2000 was $100 million and today it is less than $1000; A cost reduction of 100,000 fold. Robotic automation and software technology coming into the world of biotech R&D are helping to facilitate this cost reduction.




*(Figure 11) Courtesy: Milken Institute* The Cost of DNA reading and writing are falling dramatically

**Here are some examples of Synthetic Biology Applications:**

**Nitrogen Fertilizer:** Corn, wheat and rice need nitrogen fertilizer, about half of the $80 billion a year production, to grow. Certain plants like soybeans don't need fertilizer because there's microbes in their roots that do that same reaction. They take nitrogen out of the air and they make fertilizer for free. So what do we do? We use DNA reading to look inside the microbes on the soy, we find the code that does that taking the nitrogen and making the fertilizer and we redesign it to work inside that corn microbe. So then we print it, put it in and then you can deploy that on the seed, plant the corn an have it not need that nitrogen fertilizer.

**Burger King Impossible Whopper:** **T**hey print the gene for hemoglobin which is what makes your blood red, move it over into Brewer's yeast, the kind of yeast you use to brew beer, brew it up then add it to the veggie burger to make it bleed and taste, smell and cook right.

**Cannabis:** We look inside the plant, we find the code that produces the CBD or THC, we move it over into Brewer's yeast, you brew it up and you can produce those same molecules at a lower cost. Cannabis is fundamentally going to be a fermentation process rather than a farming industry.

**CAR-T therapies in oncology:** T cells (immune system pathogen hunting cells) are taken from a patient with cancer, genetically engineered to target the tumor then put back in their body.

In closing Avisar offered this insight: We talk about AI and the concern that we develop this robot and intelligence that's going to be smarter than us and it won't take too much time until they understand that humans are the problem and we need to get rid of them!

Citations:

1) For a full discussion of the Philips Curve, see: Jim Altenbach, "The Global Economy In a Time of Transition," RealClearMarkets, https://www.realclearmarkets.com/articles/2019/07/25/the_global_economy_in_a_time_of_transition_103833.html (July 25, 2019)

2) For a discussion of the then pending tax proposal, see: Jim Altenbach, "The Trump Tax Plan: Cutting the Gordian Knot of Tax Policy Debate?," RealClearMarkets, https://www.realclearmarkets.com/articles/2017/05/15/the_trump_tax_plan_cutting_the_gordian_knot_of_tax_policy_debate_102687.html (May 15, 2017)

3) For a discussion of the Trump trade policy, see: Jim Altenbach, "Trump Trade Policy: Navigating a Changing Paradigm in Global Trade," RealClearMarkets, https://www.realclearmarkets.com/articles/2018/06/12/trump_trade_policy_navigating_a_changing_paradigm_in_global_trade_103300.html (June 12, 2018)

4) For a discussion of the challenges of labor participation, see: Jim Altenbach, "Globalization in the Crosshairs?," RedChip Special Report, RedChip Companies, https://www.redchip.com/articles/920/globalization-in-the-crosshairs "Panel: Labor Participation and Underemployment" (Fall 2017, p.5)

Also see:

5) David Ranson, "Synopsis: Briefing Points on the Global Market Outlook as of April 2018," HCWE & Co., April 24th, 2018

6) Altenbach, "Globalization in the Crosshairs?," Panel: Beyond the Dollar, op. cit., p. 22.

7) David Ranson, "Brexit: policy errors, political terror, economic opportunities," Economy Watch, HCWE & Co., July 15, 2016, p.2-3.
8) Wayne Jett, "The Fruits of Graft: Great Depressions Then and Now," Launfal Press (2011), p.93
9) Gwynn Guilford, "Everything we thought we knew about free trade is wrong," QUARTZ, https://qz.com/840973/everything-we-thought-we-knew-about-free-trade-is-wrong/ (2016)
10) Nathan Lewis, "China Is Laying The Foundation For The Next World Gold Standard System," Forbes.com, https://www.forbes.com/sites/nathanlewis/2016/05/05/china-is-laying-the-foundation-for-the- next-world-gold-standard-system/#2b44bd72689e (May 5th, 2016)
11) W.J. Mason, "What We Get Wrong When We Talk Trade," Jacobin, https://www.jacobinmag.com/2017/01/trump-mexico-trade-tariff-import-pena-nieto (2017)

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