



# The Rising Strategic Value Of Global Technology Assets And Its Impact On Sino-Israel Relations

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# Introduction

The year 2017 commemorates 25 years of diplomatic relations between China and Israel. In March of this anniversary year, China hosted Israeli Prime Minister Netanyahu in Beijing. Accompanied by a high-level entourage<sup>1</sup>, that historic summit saw 10 bilateral agreements and business agreements signed, valued at \$25 billion. This followed an outstanding year in which \$16.5 billion of Chinese money poured into Israeli technology (a ten-fold increase from 2015)<sup>2</sup>. One third of Israel's total foreign investment was from Sino funds.

As Premier Xi Jinping stated, Israel is a “*world-renowned innovative country... pushing forward innovation-driven development ... a priority for our cooperation.*”<sup>3</sup> Israel's technology leadership and achievements are astounding.<sup>4</sup> Facing seemingly unsurmountable odds, Israel has transformed into a global technology powerhouse, with leading innovations and companies in fields as diverse as Artificial Intelligence, communications, military, energy, transportation, robotics, agriculture, water, medical technology and more. Israeli technology companies on NASDAQ are worth \$100 billion, compared to the \$1 trillion value of China's companies on the exchange.<sup>5</sup> And yet, the population of Israel is 0.6% of China's. Israeli investment in R&D (“Research and Development”), as a proportion of GDP, is the second highest in the world.

For China, co-operations with Israeli technology companies can help economic growth and advance long-term ambitions to close the “technological gap”. Co-operation with China is equally important for Israeli innovators. It helps to maintain and expand a formidable domestic hub of multinational R&D centers and technology partnerships. Israelis recognize the important value of China to augment exports.<sup>6</sup> In the last few years the technology asset growth the world over has been phenomenal. Though the growing trend in Sino-Israel technology trade far outpaces other regions, it is not disassociated from the bullish global technology market. This raises the question- are Sino-Israeli relations, strongly based on technology, vulnerable to a fall in the value of global technology asset?

The strategic value of technology is set to increase in the medium term, due to four fundamental drivers.<sup>7</sup> The following discussion uses the metaphor of a “perfect storm”, invoking four allegoric winds to explain the fundamental drivers supporting that view:

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1. Prime Minister Netanyahu was accompanied by leading officials, industrialists, academics and influencers (such as SIGNAL)

2. By comparison, Chinese investment in US technology over the same period was \$26.4 billion. <http://www.ynetnews.com/articles/0,7340,L-4960618,00.html>

3. (Baikie,2017)

4. The land mass of Israel is barely 30% larger than Beijing province. On the basis of NASDAQ data (April 2017) the market capitalization of Chinese companies stood \$1 trillion, compared to Israel's \$110 billion.

5. According to the World Bank, the population of Israel in 2015 was 8.38 million and of China was 1.371 billion.

6. CEOs of Israeli startup companies have come to understand and appreciate the value of Chinese investors. Tomer Bar-Zeev, CEO of technology company IronSource in 2015 related to the investment community that China is his third largest and fastest growing market. When IronSource opened offices in China, their monthly revenues there were \$1 million; these quickly grew to over \$4 million, every month. <http://www.viola-notes.com/how-to-launch-your-startup-in-china-tips-from-ironsource-co-founder-ceo-tomer-bar-zeev/>

7. The world has seen many market bubbles before, most notably the 2000 technology dot-com bubble. Yet average annual growth in the NY NASDAQ technology index over the last five years was 14%, far less than the 45% in the five years that preceded the 2000 dot-com bubble. Stock market indicators do not currently point to the technology market crashing. Thus the perspectives I present in this paper relate to the longer term potential for technology based on more fundamental factors.

### **The North Wind: Artificial Intelligence (“AI”)**

AI is a revolutionary new paradigm that will be an increasingly critical asset and accelerate technology convergence.

### **The West Wind: Geo-economics in America**

President Trump’s growth target and plans to resuscitate US manufacturing will spur high demand for technology assets.

### **The East Wind: Geo-economics in China**

Aside from Sino ambitions to close the “technology gap”, the Belt & Road Initiative policy, at the current juncture of technology convergence, will solidify the strategic value of technology.

### **The South Wind: Globalization Version 2**

As the technological gap between advanced economies closes, this will bring a re-order in global economic structures, making both technology assets and access to natural resources - previously disassociated - more critically strategic than ever. This phenomenon, coined by the author as “Globalization Version 2”, may disrupt the current narrative of economic development.

This perfect storm will increase the strategic value of technology in the medium term, opening an exciting new era for Sino-Israel relations. Furthermore, this author posits that Israel has the potential to meet the challenge and continue to lay the golden technology egg. It is therefore probable that foreign companies will double down on efforts to cooperate with Israeli technology companies. Israel may increasingly find itself in the middle of a bidding war for its technical know-how and innovation. Chinese companies that today create productive, deep relationships in the Israeli technology ecosystem - particularly from the bottom up- will benefit the most in the medium to long term.

## North Wind: Artificial Intelligence

*This section stems from a futurist framework developed by the author as part of a workshop series to empower business leaders to navigate rapidly changing technology trends.*

### The Internet of Things

Consider Israeli mobile application Gett, which lets passengers order Gett-connected taxicabs. Gett supplies and optimizes its network of people (passengers) to objects (taxicabs).<sup>8</sup> Gett is part of a wider phenomenon known as the Internet of Things (IoT), a disruptive emerging field where objects (transport, goods, services, appliances) are networked and connected. Haller, Karnouskos, and Schroth (2009) define the IoT as: *“a world where physical objects are seamlessly integrated into the information network, and where they, the physical objects, can become active participants in business processes. Services are available to interact with these ‘smart objects’ over the Internet, query their state and any information associated with them, taking into account security and privacy issues”*.<sup>9</sup>

8. Founded in 2010, Gett is now available in more than 100 cities and is used by more than half of London’s black cabs. <https://www.linkedin.com/company-beta/1514929> retrieved May2017

9. Haller, Stephan, Stamatis Karnouskos, and Christoph Schroth. “The Internet of Things in an Enterprise

The Internet of Things (IoT) today is nascent. The ability to use a mobile smartphone to buy a cinema ticket, order a taxi ride and reserve a restaurant table is an early stage manifestation. China's WeChat, closely observed by Western technology companies, is considered the global leader in the consumer-centric IoT. The future development of the IoT is vast and exciting. A relatively more seamless IoT would profoundly integrate the front and back ends of supply chains - from manufacturing to energy to transportation to entertainment - that today are fragmented, diverse and distinct. Long term IoT development may be profoundly disruptive, consolidating between and inside vertical industries. It is useful to consider simple metrics indicating the growth potential of the IoT, even at this early stage. Consider:

**The number of objects to “join the IoT party”.** 6.5 billion objects were connected globally in 2016. That's projected to grow to 21 billion in 2020. (Gartner Consulting)

**The increasingly proliferating number and variety of sensors.** Sensors are electronic devices that detect changes to the environment, sending that data to other electronics.<sup>10</sup> They enable IoT connectivity. The global sensor market was worth \$124 *billion* in 2016. Its value is set to double by 2020.

**Upside potential of people to “join the IoT party”.** Today, the mobile smartphone is the current dominant connectivity gateway. As of January 2017, nearly half the planet carried a mobile telephone,<sup>11</sup> indicating a potential to more than double, especially as the global population increases.

## The Slowing of Moore's Law (1965) - the “theory that defined the tech industry”<sup>12</sup>

Back in 1965, Gordon Moore predicted – correctly - that computer processing power would increase exponentially over time. Technologies rolled out in the last fifty years were contingent on available processing (which roughly doubled every two years); this in turn was contingent on improving hardware and software developments. **Moore's Law - exponentially higher processing power - has been crucial for innovation.** *Consider Israeli company Compugen, a bioinformatics pioneer. Compugen merged two previously distinct fields, biology and mathematics, to yield a new field, bio-informatics.<sup>13</sup> The backbone to Compugen's coming of age was a computer dedicated to bio-informatics that, in accordance with Moore's Law, had 1,000 times more processing power than its peers and in accordance with Moore's Law.*

However, at time of writing, the signs are that Moore's Law is slowing. Chips cannot get much smaller; pushing higher processing requirements risks physical over-heating.<sup>14</sup> As MIT Technology Review stated bluntly in 2016 “Shrinking transistors have powered 50 years of advances in computing—but now other ways must be found to make computers more

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Context, Future Internet---FIS 2008: First Future Internet Symposium, FIS 2008 Vienna, Austria, September 29-30, 2008 Revised Selected Papers.” (2009).

10. <http://www.prnewswire.com/news-releases/global-markets-and-technologies-for-sensors-300430105.html> Retrieved April 2017

11. Though not all are smartphones. Source: Amdocs Open Markets, Presentation at Monage San Jose, March 2017, Oison Lunny

12. <http://www.wired.co.uk/article/wired-explains-moores-law>

13. Interestingly, Compugen was born of a real-life marriage. In the early 1990s, Liat Mitz, a geneticist, commented to her mathematician husband Eli that limited processing power was holding back DNA sequencing. Eli picked up the gauntlet. Eli and his team created a computer platform with processing power 1,000 times faster than its peers, and powerful enough to sequence genes. Seven years later, Compugen listed on the NASDAQ.

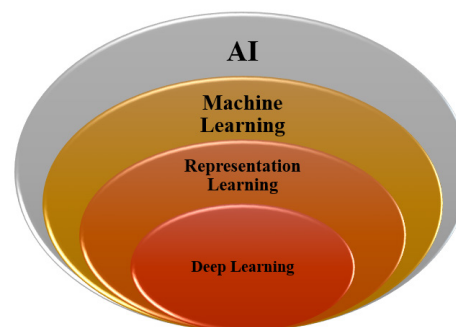
14. See <https://www.technologyreview.com/s/601441/moores-law-is-dead-now-what/> Retrieved May 2017

capable.” This “roadblock” in Moore’s Law is a huge concern for technology advancement, which requires increasing processing power.

## Artificial Intelligence - A Critical Factor to Augment Processing Power and the IoT

The IoT is particularly vulnerable to a slowdown in processing power. Consider that by 2025, more than 100 billion devices will be installed and connected on the IoT<sup>15</sup>, generating huge quantities of unstructured data. Insufficient processing power will emasculate the potential of the IoT to harness that data. Artificial Intelligence (AI) is a doubly critical component for the IoT. Firstly, AI is part of a suite of solutions (the cloud; specialist computing architecture: AI software<sup>16</sup>) putting Moore’s Law back on track to yield ever increasing processing power. Secondly, AI can unlock deep insights from big data<sup>17</sup> by machine learning. Advanced pattern recognition can ultimately alleviate net demand for brute processing power, which is in relatively short order, due to the slowing of Moore’s Law.

### Artificial Intelligence Landscape



Source: Reproduced by author based on graphic from the book *Deep Learning*, MIT Press, November 2016 <https://mitpress.mit.edu/books/deep-learning>

## Has Artificial Intelligence Come of Age?

The AI field has been around for many years, with ups and downs, such as the AI winters of 1974-1980 and 1987-1993, when research efforts almost dried up. AI has advanced greatly of late. But has this critical component to make the IoT work come of age? Possibly the strongest affirmative answer comes from the AI experience with Go, the ancient Chinese game. Go has more possible moves than atoms in the universe; in other words, no computer can rely on brute processing power to play it well. Highly advanced AI pattern recognition is the key to winning Go. In 2016, Google’s AI company Deep Mind, after a series of games, began to consistently beat Lee Sedol, reigning Go champion. Experts had forecast 3-10 years before Deep Mind would emerge victorious. Instead, it took just months for Deep Mind to advance from learning the game from Sedol to beating him. This AI achievement shocked many. AI taught itself to be better at Go than the world champion; and the nature of the AI experiment means that no human can assess how perfect Deep Mind’s game is.

15. In 2025, 100 billion devices would generated revenues close to \$10 trillion [Gartner, 2017].

16. At this juncture, the market generally agrees on three possible paths to overcome the slow-down in processing power.

1 - The “cloud”, the network of inter-connected data centres. 2 - Specialist computing architecture. This includes specialized chips designed for cloud computing, neural-network processing, computer vision and other tasks. 3 - Software, namely Artificial Intelligence (AI) - computer self-learning. Successful AI increasingly converges on mimicking natural human intelligence.

17. <https://www.wired.com/insights/2014/11/iot-wont-work-without-artificial-intelligence/> Retrieved May 2017

The next step for AI, having surpassed humans, is for different AI systems to play and learn from each other. No wonder many assert AI is the new technology revolution in town. And if AI can win at a game which has more potential moves than atoms in the universe, AI will surely cope with an IoT data explosion.

## The Strategic Value of Artificial Intelligence

The potential revenue value of AI is substantial. In 2016, global revenue forecasts were \$644 million; by 2025 this is set to increase more than 60 times, to \$39 billion.<sup>18</sup> Yet as Andrew Ng (former Head of AI at Baidu) intriguingly stated “AI is the new electricity.”<sup>19</sup> It therefore is interesting to review the strategic value of AI. There are several aspects contributing to AI’s long term strategic value:

*AI: part of a suite of solutions replacing a paradigm*

AI is part of a suite of products that may put Moore’s Law back on track. This suggests AI may have embedded strategic value for its potential role in the new technological paradigm that increases computer processing power.

*AI: enabling big data insights and alleviating the need for greater processing power*

The Compugen example and countless others illustrate the critical role of computer processing power - without it, innovations could not come to market. If better AI (such as pattern recognition in big data) makes processing power less critical then some strategic value in the computer processing domain may ultimately transfer to AI.

*AI: a catalyst for economic activity, such as industry consolidation and M&As*

A relatively more seamless IoT, enabled by AI, would profoundly integrate the front and back ends of supply chains that today are fragmented, diverse and distinct and may trigger convergence in or across markets. This implies a possible strategic value embedded in AI, as a catalyst to economic activity such as Mergers and Acquisitions.

*AI: a non-linear multiplier effect on the value of a more unified and advanced IoT.*

Metcalf’s law states that the value of a (telecommunications) network is proportional to the square of the number of connected users of the system. The author posits that when AI enables the IoT to grow and function more seamlessly, it effectively adds more nodes and so greatly increases the overall economic value of the IoT network, in parallel to Metcalf’s Law. Thus, AI has very high strategic (and economic) value as a non-linear economic multiplier of the IoT network.

The discussion up to this point has centered around the IoT. However, the IoT may be considered one piece in a global technology trend termed “Cross Merging,” a proprietary futurism model designed by the author for clients, capturing macro technology trends. It may be summarized as the collapse of boundaries between disciplines, cognitive functions and objects (contrasting with Kurzweil’s Technological Singularity<sup>20</sup> by the perspective on Technology Evolution). In the same way that AI pattern recognition is critical to the IoT’s unstructured big data, AI is also critical to the advance of technology predicted by the Cross Merging model. To sum up, AI is a revolutionary technology with very high strategic value. AI is potentially a new paradigm that will become an increasingly critical asset and accelerate

18. Consulting firm Tractica See <https://globenewswire.com/news-release/2017/03/09/933837/0/en/Artificial-Intelligence-Market-Forecasts-2016-2025-Across-27-Industry-Sectors.html> Retrieved May 2017

19. <https://medium.com/@andrewng/opening-a-new-chapter-of-my-work-in-ai-c6a4d1595d7b> Retrieved May 2017

20. Raymond Kurzweil, Publisher Viking, 2006, The Singularity is Near

technology convergence. Companies and countries that acquire good AI will benefit from technological and economic growth for years to come.

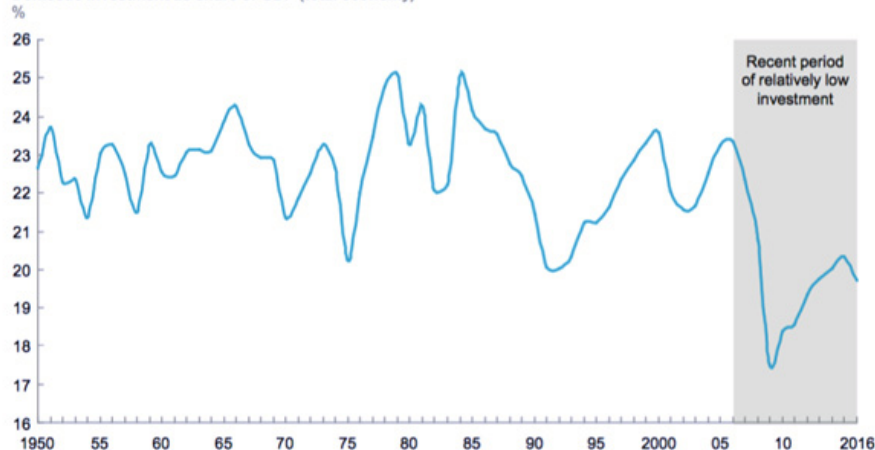
# West Wind: Geo-Economics in America

Assuming the Trump Administration will be stable, endure the next four years and fulfil campaign promises related to the economy, what might lie ahead for technology demand emanating from the US? The US may be unlikely to engage in a trade war with China. A 2017 analysis by Deutsche Bank notes that, despite figures showing China's contribution to the trade deficit at around 50%, other countries are the ultimate source of about 37% of China's exports to the US (2015). Accounting for that would put China's share of the deficit at just 16%. This suggests that a trade war with China would be undesirable since it would involve other participants in the global supply chain, even including US companies. Manufacturing is arguably the most important sector in the US economy, contributing the most to total output and employment (around 21% of total). With both labor productivity and manufacturing employment in long-term decline, manufacturing has good potential for improvement. A revival of US manufacturing is key to stimulating growth in the US economy, supporting the President's May 2017 announcement of a 3% economic growth target.

Strategically, the US may have little choice but to double down on technology upgrades of its current manufacturing facilities. As of 2016, the US ranked second place on Deloitte's Global Manufacturing Competitiveness Index, behind China. As China's wealth dissipates, pushing up workers' wages,<sup>21</sup> US investment in and adoption of advanced manufacturing technologies is the primary way the US might displace China's number one position. As consulting firm Deloitte reported from its survey of CEOs from global companies- "*CEOs say advanced manufacturing technologies are key to unlocking future competitiveness.*"

Investment has been declining in the US despite ultralow interest rates

Domestic investment as share of GDP (total economy)



SOURCE: BEA; McKinsey Global Institute analysis

The Productivity Puzzle, March 2017 Discussion Paper, McKinsey Global Institute

Advanced manufacturing technologies include a plethora of technologies, in fields as diverse as the IoT, AI, robotics, advanced materials, 3D printing, augmented reality, energy and others. Although upgrading existing enterprises with automated processes creates "technological unemployment,"<sup>22</sup>

21. <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Manufacturing/gx-global-mfg-competitiveness-index-2016.pdf> 2016 Global Manufacturing Index

22. "We are being afflicted with a new disease of which some readers may not yet have heard the name, but of which they will hear a great deal in the years to come- namely, technological unemployment". Economist John Maynard Keynes, *Essays in Persuasion*, New York: W. W. Norton & Co., 1963, pp. 358-373.

it also promotes positive economic spillovers, stimulating secondary technology demand (such as cyber) and service industries. New advanced manufacturing enterprises create new jobs without the disadvantage of technological unemployment. There are currently positive early signs in the US manufacturing technologies sector. Consider the May 2017 announcement of Apple CEO Tim Cook, that the company is investing \$1 billion into a US Advanced Manufacturing Fund.

*“In manufacturing, we ask ourselves: How can we get more people to do advanced manufacturing in the United States? And I’m proud to tell you that we’re creating an advanced manufacturing fund. We’re initially putting \$1 billion in the fund... if we can create many manufacturing jobs around, those manufacturing jobs create more jobs around them because you have a service industry that builds up around them.... How do we grow our employee base? How do we grow the developer base? How do we grow manufacturing? And you will see us bring things to market in all of those areas across this year. We’re really proud to do that.”<sup>23</sup>*

To summarize, technology assets are set to be particularly strategic for the US manufacturing sector in the medium term, increasing demand for technology assets in the years ahead.

## East Wind: Geo-Economics in China

According to Euromonitor, average hourly manufacturing wages in China trebled from \$1.20 in 2005 to \$3.60 in 2016. That wage pressure may threaten growth. It risks manufacturing migrating from China to countries with lower labor costs, such as Brazil, Mexico or South Africa, (where hourly wages in manufacturing fell over the same period - \$2.90 to \$2.70, \$2.20 to \$2.10, \$4.30 to \$3.60 respectively). The 13th 5 Year Plan (2016-2020) (see: “An Optimized Modern Industrial Systems”<sup>24</sup>) specifically targets the upgrade of Chinese manufacturing facilities, which would offset wage pressures. Indeed, China recently launched a \$30 billion venture capital fund aimed at upgrading technology in the industrial sector.<sup>25</sup>



Countries covered by BRI

*Source: Hong Kong Trade Development Council based on Chinese Academy of Social Sciences, Graphic from Future Watch Report, Team Finland*

23. <http://www.cnn.com/2017/05/03/tim-cook-on-jim-cramer-complete-transcript.html> Jim Cramer interviews Tim Cook: the complete transcript

24. <http://en.ndrc.gov.cn/policyrelease/201612/P020161207645766966662.pdf>, PART V AN OPTIMIZED MODERN INDUSTRIAL SYSTEM, THE 13TH FIVE-YEAR PLAN FOR ECONOMIC AND SOCIAL DEVELOPMENT OF THE PEOPLE’S REPUBLIC OF CHINA 2016–2020)

25. <https://www.ft.com/content/fb06343e-6520-11e6-8310-ecf0bddad227> Retrieved April 2017



The Belt & Road Initiative (“BRI”) - the New Silk Road initiative - aims to link more than 60 countries physically, commercially and culturally. BRI goals include<sup>26</sup> infrastructure connectivity, increased trade and investment flows, financial integration, policy coordination and better relations. BRI covers about 60% of the global population, and 30% of global GDP- yet only seven BRI countries are developed economies.<sup>27</sup> Hence the BRI has a huge upside for investment in infrastructure technologies. The “Digital Silk Road” (DSR), introduced in 2016 by Lu Wei, China’s Cyberspace Administration director, is set to coordinate cooperation in 5G, cloud computing, the IoT, e-commerce, digital investment and smart energy. The DSR would create a global connectivity platform and by doing so drive technology acquisition, since efficiency in the BRI makes the project viable and economically competitive.

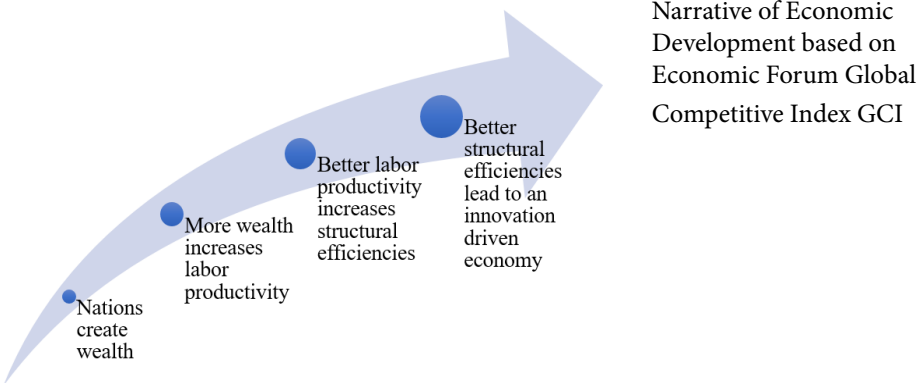
The BRI and DSR is set to drive technology demand across the board and particularly boost demand for technologies related to IoT, infrastructure and AI.

# South Wind: “Globalization Version 2”

The BRI involves economic expansion; Trump’s focus on domestic manufacturing and job creation is more inward-looking. Both China and the US rely on technology to achieve their goals. As the two countries progress towards their respective goals, they will stand in more direct competition in the globalized economy. This author defines Globalization Version 2 as a critical future point when a critical mass of countries run their economies on advanced technologies and widespread automation. The trigger may be the roll-out of the IoT, BRI and / or Digital Silk Road. In terms of critical mass, consider that America, China and the BRI countries total about 70% of global GDP (2015 figures). Globalization Version 2 may bring a seismic shift to the dynamics in the global economic system. Widespread automation is likely to make the absolute contribution of labor costs a less significant contributor to a country’s comparative advantage for economic productivity. That’s a change from the current economic narrative for global competitiveness whereby better labor productivity leads to an innovation-driven economy.

**Globalization Version 2 may disrupt the current narrative of economic development**

*(source: World Economic Forum global competitiveness index GCI)*



26. National Development and Reform Commission, Ministry of Foreign Affairs and Ministry of Commerce of the Peoples’ Republic of China, Vision and Actions on Jointly Building the Silk Road Economic Belt and the 21st Century Maritime Silk Road, March 28, 2015  
 27. Israel, Singapore, Slovakia, Slovenia, Estonia and the Czech republic

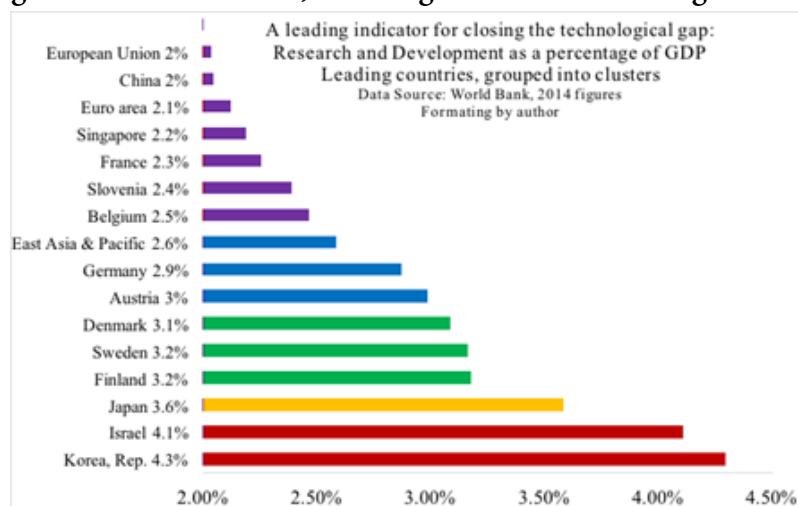
In Globalization Version 2, both advanced technology and access to natural resources may have far greater weight for countries in their bid for global competitiveness. Furthermore, if future improved AI truly unifies the IoT, then the strategic importance of natural resources may be even greater. Globalization Version 2 could ultimately manifest a counterintuitive scenario whereby the more technology advances, the more strategic natural resources may become.

Some suggest<sup>28</sup> that differences in national technological competencies are the main driver of international trade. It is possible to foresee a future where the technological competency of IoTs associated with country blocs would be the main driver of international trade. Instead of trade wars, struggles may emerge over who determines the technology standards in the emerging IoT hegemony. In the journey towards Globalization Version 2, in the nearer term, technology acquisition would be a strategic imperative for global competitiveness.

## Israel as a technology leader

So technology will remain a highly strategic asset to countries, economies and institutions, and AI even more so. Countries that acquire cutting edge technology will gain a cutting edge in economic competitiveness for years to come. Consider the view of Microsoft founder, Bill Gates: “Israel is a major player in the high-tech world... there is a greater concentration of high-tech manpower here in comparison to other countries- almost to the extent of Silicon Valley.” At the same time, China’s societal advances in the last decade are astonishing. Closing the technological gap is important for China. China has the opportunity in the decade ahead to continue its accelerating investment in R&D.

### Clusters of global leaders in R&D, a leading indicator for closing the technological gap



Source: World Bank data, 2014, Unbounded Research.co

Overall, Israel is the second most innovative nation in the world<sup>29</sup> with a leading global position in R&D as a percentage of GDP, as the graph above shows. Forward-thinking policies of the Israel Innovation Authority reflect the high importance, support and prioritization of the technology sector by the Israeli government. In 2016 alone more than

28. Dosi, Giovanni, Freeman, Christopher, Nelson, Richard, Silverberg, Gerald and Soete, Luc, (1988), Technical Change and Economic Theory, Laboratory of Economics and Management (LEM), Sant’Anna School of Advanced Studies, Pisa, Italy, <http://EconPapers.repec.org/RePEc:ssa:lembs:dosietal-1988>.

29. World Economic Forum’s Global Competitiveness Report 2016-2017

\$4.8 billion was invested in Israel-based high-tech startups.<sup>30</sup> Consider too Intel's 2017 acquisition of Israeli company Mobileye for over \$15 billion. (Its product is AI-enabled machine vision, the company is part of the transport IoT). The increasing proportion of foreign funds investing in Israeli high tech (graph below) and other indicators attests to robust market confidence in Israel's technological and innovative capacities. Yet the question remains- will technological cooperation with Israel in the far future continue to be fruitful? After all, past success is no guarantee of future success.



The author posits that the answer is affirmative due to three factors.

Firstly, Israel retains its national characteristic of creativity and resilience, which helped transform the country from an agricultural economy in the 1940s to a global technological powerhouse today. Creativity and resilience account for a considerable number of Israeli innovation success stories that emerged from severely constrained natural and monetary resources. (Case studies span diverse fields, including solar power, water and food technology, defense, and more<sup>31</sup>). In the long game of highly competitive and fast moving technological fields<sup>32</sup>, resilience and creativity are highly advantageous. Secondly, Israel is culturally accepting of diverse opinions and of entrepreneurial failure. This lowers social barriers to a high innovation churn, which statistically increases the overall probability of entrepreneurial success. A third factor is Israel's very specific national circumstance. Israel's population is very small (8 million), highly educated, highly socialized and dispersed on a very small land mass. Together, these circumstances help organically grow hubs of geographically close and highly connected intellectual capital. Such an ecosystem is fertile ground for cross-pollination of ideas, technology spill-overs and rapid reactivity to market developments. In the light of the author's Cross Merging Model, such an ecosystem is ideally geared towards productive future innovation. Thus, there is a strong case for predicting that Israel will maintain and grow its technological leadership in the years ahead.

30. Forbes, <https://www.forbes.com/sites/deborahweinswig/2017/03/10/retail-tech-innovation-is-booming-in-israel-top-three-insights-from-our-innovation-technology-tour/#148aae242078> retrieved June 2017

31. Netafim was founded in the 1930s by a farmer pointing out to Blass, a prominent member of a communist farm (kibbutz) a "tree growing without water". Blass noted that a dripping leaky pipe was letting the tree survive in harsh desert conditions. He later wrote a patent for drip irrigation and founded the irrigation company Netafim. As of 2014, Netafim's revenues were in excess of \$750mm, with operations in 150 countries, 13 factories and 3,000 employees.

32. Some suggest this resilience stems from survival of historic hardships pre-dating and including the establishment of the State, though this is subjective.

# Conclusion

Technology's strategic value is set to greatly increase in the years ahead. The North Wind of Artificial Intelligence points to a new technological era that will be profoundly disruptive. The West Wind in America points to a limited period of economic insularity coupled with an upsurge in investment, particularly manufacturing technologies. The East Wind of China similarly blows towards technology - Artificial Intelligence and manufacturing - with the ambitious Belt & Road Initiative and Digital Silk Road policy, which may greatly accelerate a unified Internet of Things. Finally, this author hypothesizes the South Wind will be "Globalization Version 2", a future point at which a critical mass of the global economy will experience a critically high level of technological unemployment due to automation. This is likely to cause profound global economic disruption in the long term. In the medium term, it is likely to increase strategic demand for technology, as countries jostle to consolidate their global competitiveness.

This perfect storm would make technology more strategic than ever in the years ahead. Consequently, Chinese companies that properly place themselves in the Israeli innovation eco-system will reap great benefits in the medium to long term. Israel has the potential to meet the challenge and continue to lay the golden technology egg. Israel may expect to see foreign companies doubling down on their efforts to cooperate. Israel may increasingly find itself in the middle of a bidding war for its technological know-how and innovation. In game theory jargon, successful repeat games between two players create loyalty and trust. It is no coincidence that Intel, which has had a substantial Israeli R&D presence for many years, bought out Mobileye for \$15 billion. Its long-term presence signaled to the Israeli technology eco-system that Intel is a trusted commercial partner. Israel has a strong preference for international R&D centers, which can facilitate cross-pollination in the ecosystem and provide Israeli technologists with valuable insight into trends in export markets, to which their innovations can cater.

If the perfect storm hits- from the winds of the AI revolution, of American and Chinese geoeconomics, and Globalization Version 2- there may be an unprecedented demand for valuable Israeli technology in the medium term. As a technology leader, Israel may find itself in the middle of a bidding war for its know-how and innovation. If so, its innovation policies may evolve accordingly, further prioritizing co-operations with long game international players. Israeli innovation and enterprise tends to function on a bottom-up model, in contrast to the Chinese top-down model. The deals signed in March 2017 in Beijing are significant -they signal a growing maturity in a new era in Sino-Israel relations, in which the bottom-up and top-down approaches of both countries are converging, following five years of accelerating cooperation:

Top-down, consider academic cooperation: such as the 2013 joint venture between Israel's prestigious Technion University with Shantou. Or the 2017 investment by Chinese billionaire Zhou Qinghou in Haifa University's Artificial Intelligence capabilities. Bottom-up, consider the investments of Robin Lo (Baidu Chairman) in four Israeli start-ups, publically announcing his appetite for more; or, market enthusiasm for Chinese CreditEase's second venture fund, which focuses on Israeli technology<sup>33</sup>, and had more than \$32 million in commitments in January 2017 alone.

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33. Fields of interest: virtual and augmented reality, artificial intelligence and machine learning, digital healthcare, the Internet of Things, cloud and data storage and advanced manufacturing.

Chinese companies that today create productive, deep relationships in the Israeli technology ecosystem - particularly from the bottom up- will benefit the most in the medium to long term. For some companies, establishing a multinational R&D center may be too far off. Playing the long game may mean starting off by working with a well-connected start-up expert in Israel. Learning the market, having an intermediary for the cultural differences and creating a program to feed information back to the Israeli ecosystem as to what the Chinese market is looking for may be a fruitful strategic approach.

In all events, Artificial Intelligence, Geo-Economics and Globalization Version 2 will increase the strategic value of technology in the medium term, opening an exciting new era for Sino-Israel relations.

*Ariella Berger runs UnBounded Research, a strategic consultancy based in the heart of Tel Aviv Israel, with deep connections to the multidisciplinary networks, institutions, start-ups and technologists that make up Israel's high-tech hub. A keynote speaker and seasoned Start-up Advisor, from 2009 to 2016 Ariella was Head of Energy and Oil Alternatives Research at IEP, an influential economics think tank where she worked closely with government, academia and industry. Prior to this she held senior positions in finance, business and investment.*

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