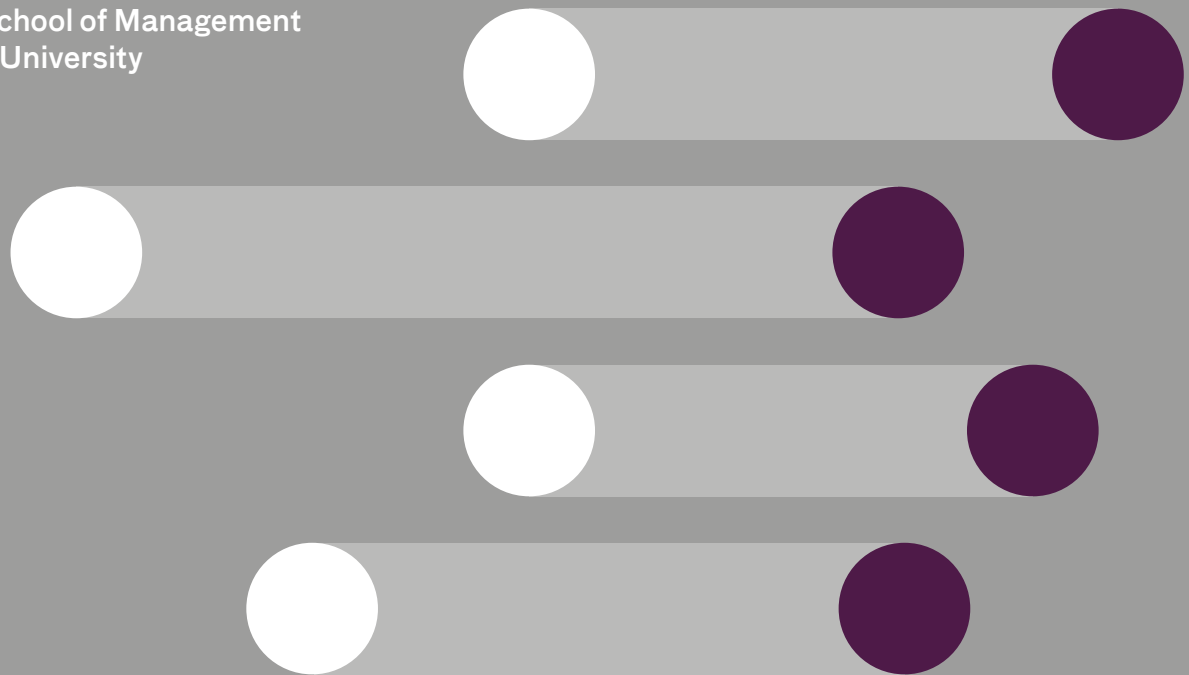


Coller Venture Review²⁰²⁰

Coller School of Management
Tel Aviv University



Venture Policy and Management

Are IP Restrictions Killing the Venture Economy?

Deep Innovation

Is AI more Artificial than Intelligent?

Virtual Roundtable

The COVID-19 Crisis for VC –
Death Knell or Springboard?

Trends in Venture

What are the Entrepreneurship Myths
that Deter Entrepreneurs?

Industry Analysis

A Shot in the Arm for Digital Health Innovation

Venture Digest

Some of the Year's Best Reads

**Bridging Theory and Practice
in Venture**



Coller School of Management
Tel Aviv University

Letter from the Editor

Coller Venture Review, the flagship journal of the Collier Institute of Venture at Tel Aviv University, continues its mission to help bridge theory with practice in the areas of venture, innovation, and entrepreneurship.

In this issue, we draw on the insights and expertise of a range of contributors across changing technology paradigms and industries. Our articles continue to articulate emerging trends, extract generalizable themes, and lend insights associated with the codification of new ways of thinking linked to action in the conceptualization, financing, and execution of innovation and new venture creation.

As 2020 ends, I write with profound recognition of the challenges that the COVID-19 pandemic has brought. Consequently, the articles included in this issue of the *Collier Venture Review* indeed reflect the global challenges and opportunities across the changing venture landscape. We have attempted to address the profound changes we have absorbed globally in every aspect of our lives, from digital health to fintech in a post-COVID-19 world. For entrepreneurs, investors, academic leaders, and CEOs the impact will transcend how we invest, what we invest in, how we work together, and the impact we can reasonably expect. We know that the choices will necessarily be practical as well as moral.

Over the last year, our Editorial Board has become more involved and we are grateful that they have contributed to our Venture Digest, highlighting some of the year's best reads in areas ranging from entrepreneurial team formation to social entrepreneurship. Many thanks to Prof. Shai Bernstein in particular for his leadership of our virtual roundtable with VC investors. Many thanks as well to Dr. Leslie Broudo, our Managing Editor. We appreciate the input of all our contributors, colleagues, and collaborators worldwide for their dedication and vision.

We invite our colleagues to continue to follow us. As always, we remain focused on our mission bridging theory and practice in venture in service of a shared and bright future ahead. While the results of our work will not be measurable in weeks or months, we hope this first step can help guide our future. We welcome any comments and suggestions from our readers that will help us improve the value of the *Collier Venture Review* to its readership.

Sincerely,



Moshe Zviran
Editor-in-Chief

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IP, Power, and the Pandemic

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The Curious Case of Patent Balance Sheet Invisibility

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Company Practice,
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David N. Lawrence, Esq.
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Overview

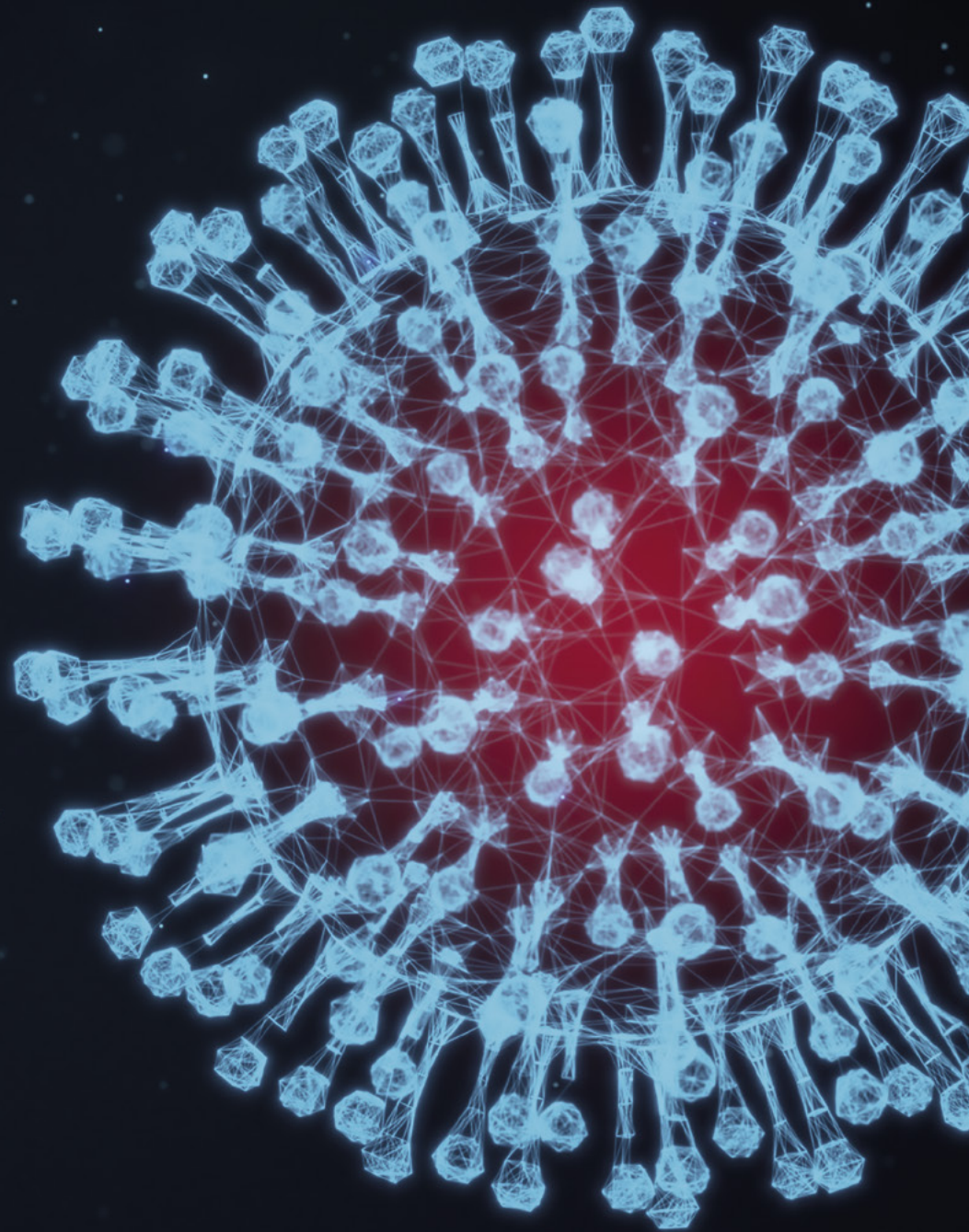
Our *Venture Policy and Management* section frames questions at the intersection of new venture creation and policy globally. In this issue, we address some of the questions surrounding intellectual property, including those brought about by COVID-19.

Joseph Stiglitz and his co-authors, Arjun Jayadev and Achal Prabhala, address the potential benefits of patent pooling to support the more efficient development and delivery of vaccines.

John A. Squires and David N. Lawrence, formerly of Goldman Sachs, address the non-systematic valuation of patents on the balance sheets of technology startups.

Together, these articles combine theory and practice to help us consider how seeming individual-level changes become aggregated and amplified. They suggest both promise and shifts in policy and regulation to ensure the distribution of benefits. From the perspective of both public health and global M&A, it appears clear that intellectual property measures of efficacy call for a systematic revaluation across current geographic, demographic, and economic boundaries.

Looking forward, future discussions in the *Venture Policy and Management* section will continue to raise important policy questions in keeping with trends in innovation and new venture creation globally.



IP, Power, and the Pandemic

Professor Joseph E. Stiglitz
*University Professor,
Columbia University
Nobel Memorial Prize Laureate
in Economic Sciences*

Mr. Achal Prabhala
Fellow, Shuttleworth Foundation

Dr. Arjun Jayadev
*Associate Professor of Economics,
University of Massachusetts, Boston*

Imagine a world in which a global network of medical professionals monitored for emerging strains of a contagious virus, periodically updated an established formula for vaccinating against it, and then made that information available to companies and countries around the world. Moreover, imagine if this work were done without any intellectual-property (IP) considerations, and without pharmaceutical monopolies exploiting a desperate public to maximize their profits.

Imagine too a world in which a global network of scientists searched for vaccines and therapeutics to combat COVID-19, with only an ambition of getting the medicines to as many people as cheaply and as quickly as possible—a world in which the drug companies see COVID-19 not as an opportunity for unprecedented profits, but as one for providing unprecedented benefits to a world immersed in a pandemic.

This may sound like a utopian fantasy, but it is actually a description of how the flu vaccine has been produced for the past 50 years. Through the World Health Organization’s Global Influenza Surveillance and Response System¹, experts from around the world convene twice a year to analyze and

discuss the latest data on emerging flu strains, and to decide which strains should be included in each year’s vaccine. As a network of laboratories spanning 110 countries, funded almost entirely by governments (and partly by foundations), GISRS epitomizes what Amy Kapczynski of Yale Law School calls² “open science.”

Because GISRS is focused solely on protecting human lives, rather than turning a profit, it is uniquely capable of gathering, interpreting, and distributing actionable knowledge for the development of vaccines. While this approach may have been taken for granted in the past, its advantages are quickly becoming clear.

The world has changed a lot since Jonas Salk’s polio vaccine, which was made freely available immediately. Today most vaccines that come to market are patented. For example, PCV13, the current multi-strain pneumonia vaccine administered to babies, costs hundreds of dollars because it is the monopoly property of Pfizer. And although Gavi, the Vaccine Alliance subsidizes some of the costs of the vaccine in developing countries, many people still cannot afford it. In India, more than 100,000 preventable infant deaths³ from pneumonia are recorded every year, while the

US\$5 billion

Annual revenue for Pfizer from pneumonia vaccine

“

As public-health advocates and scholars have long argued, monopolies kill, by denying access to life-saving medicines that otherwise would have been available under an alternative system

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vaccine brings in roughly \$5 billion in revenue⁴ for Pfizer annually.

We need to acknowledge that the current system—in which private monopolies profit from knowledge that is largely produced by public institutions—is not fit for purpose. As public-health advocates and scholars have long argued, monopolies kill, by denying access to life-saving medicines that otherwise would have been available under an alternative system—like the one facilitating the yearly production of the flu vaccine.

There is already some movement in favor of alternative approaches. For example, Costa Rica’s government recently called on the WHO to establish a voluntary pool of IP rights for COVID-19 treatments, which would allow multiple manufacturers to supply new drugs and diagnostics at more affordable prices.

Patent pooling is not a new idea. Through the Medicines Patent Pool⁵, the United Nations and the WHO have for years sought to increase access to treatments for HIV/AIDS, hepatitis C, and tuberculosis, and have now expanded that program to cover COVID-19. Patent pools, prize funds, and other similar ideas are part of a broader agenda to reform how life-saving drugs are developed and made available. The goal is to replace a monopoly-driven system with one based on cooperation and shared knowledge.

In the current climate of cooperation in the name of societal well-being, it is easy to forget that in the pharmaceutical arena, what we have seen in the past is the very opposite of this. Pharmaceutical companies have been involved in what can be called the “Enclosing of the Knowledge Commons”, extending control over life-saving drugs through either frivolous or secondary patents, preventing production and use of generics, in an attempt to indefinitely extend



their monopoly profits—leading to less access and higher prices, and in some cases, to unnecessary deaths. The insulin crisis in the US is only one example of this. A drug that has been well-known for decades is unaffordable for many primarily because of the indiscriminate granting of follow on patents. While there are instances where drug companies have seen remarkable advances, almost always their products rest on advances in basic science financed by governments, foundations, and education institutions. Most importantly, we don’t need to pay the enormous price that our broken system of intellectual property extracts to get these advances.

Of course, some will try to argue that dealing with COVID-19 is a matter that is sui generis. They want to fall back just on pressuring the drug companies to behave well, not to charge excessively, with the threat of using compulsory licenses if they don’t. But that would be a mistake: The COVID-19 crisis is simply exposing, in a dramatic way, the flaws in our current system. At a time when cooperation is critical, we have an IP system that encourages secrecy; at a time when having the widest dissemination of drugs at the lowest prices is essential for the public health and societal well-being, we have an IP system that encourages charging what the market would bear—and right now, that’s an enormous amount. Fortunately, the scientific community has seen beyond short-term concerns about profits, but it is not clear that our pharmaceutical companies will, and even if they do for the moment, ➔

“

Patent pools, prize funds, and other similar ideas are part of a broader agenda to reform how life-saving drugs are developed and made available. The goal is to replace a monopoly-driven system with one based on cooperation and shared knowledge

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it is unlikely that they will do so over the long run. For example, only after some public pressure did Gilead rescind its “Orphan Drug”⁶ status for Remdesivir, which would have given it an additional 7 years of monopoly.

We trial vaccines, hopefully one or more will generate a plausible cure, and current results are promising. But these will also be patentable. It is sobering to note that while we think of Salk’s polio vaccine as the archetypal example of a vaccine—made freely available, so that polio was soon brought under control—many vaccines are coming to market after being patented, which means that originator companies will have the right to charge high prices and to decide who will obtain the patent. Oxfam recently reported⁷ that the richest countries, with 17 percent of the world’s population, have already cornered over 50% of the promised doses available from the promising vaccine candidate producers. The organization estimates that the UK have obtained commitments of five doses per capita, while Bangladesh

by contrast has only been able to obtain a commitment of one dose per 9 people. Some vaccine producers have already announced that they will charge prices that are high enough to seriously deter usage in poorer countries. Apart from the obvious ethical concerns of this situation, the fact that doses are not available for a contagious disease is likely to be deeply socially inefficient since it would prolong the pandemic with all its attendant spillover externalities to production.

The obvious solution here, too, is to promote what has come to be known as a ‘people’s vaccine’⁸—the widespread and free usage of vaccines, treatments and tests with a priority given to the vulnerable, frontline workers and poorer countries with limited capacity to save lives. But once again, that would require overhauling the current IP status quo.

For too long, we have bought into the myth that today’s IP regime is necessary. The proven success of GISRS and other applications of “open science” shows that it is not. With the COVID-19 death toll rising, we should question the wisdom and morality of a system that silently condemns millions of human beings to suffering and death every year.

It’s time for a new approach⁹. Academics and policymakers have already come forward¹⁰ with many promising proposals¹¹ for generating socially useful—rather than merely profitable—pharmaceutical innovation. There has never been a better time to start putting these ideas into practice. ■

“
For too long, we have bought into the myth that today’s IP regime is necessary. Academics and policymakers have already come forward with many promising proposals for generating socially useful—rather than merely profitable—pharmaceutical innovation
”

¹ www.who.int/influenza/gisrs_laboratory/en/

² <https://scholarship.law.cornell.edu/clr/vol102/iss6/3/>

³ www.business-standard.com/article/health/pneumonia-kills-one-child-every-39-seconds-127-000-died-in-india-2018-pneumonia-cause-data-119111300489_1.html

⁴ www.axios.com/pfizer-vaccine-prevnar-top-selling-drug-161f7f05-c68e-4deb-93bb-c121664b7f15.html

⁵ medicinespatentpool.org

⁶ www.fiercepharma.com/pharma/gilead-asks-fda-to-rescind-remdesivir-orphan-drug-tag-after-public-backlash

⁷ www.thehindubusinessline.com/news/covid-19-vaccine-wealthy-nations-have-secured-over-50-per-cent-of-promised-doses-says-oxfam/article32640307.ece

⁸ www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2020/may/20200514_covid19-vaccine

⁹ D. Baker, A. Jayadev and J. Stiglitz, *Innovation, Intellectual Property, and Development: A better set of approaches for the 21st century*, accessibsa.org, 2017, <https://cepr.net/images/stories/reports/baker-jayadev-stiglitz-innovation-ip-development-2017-07.pdf>

¹⁰ A. Jayadev, J. Stiglitz, *Two Ideas To Increase Innovation And Reduce Pharmaceutical Costs And Prices*, Project HOPE: The People-to-People Health Foundation, Inc., 2008, www.healthaffairs.org/doi/full/10.1377/hlthaff.28.1.w165

¹¹ A. Jayadev, J. Stiglitz, *Medicine for tomorrow: Some alternative proposals to promote socially beneficial research and development in pharmaceuticals*, Macmillan Publishers Ltd, 2010, www8.gsb.columbia.edu/faculty/jstiglitz/sites/jstiglitz/files/2010_Medicine_For_Tomorrow_pub.pdf



About

Professor Joseph E. Stiglitz is an award-winning American economist and a University Professor at Columbia University. He is the co-chair of the High-Level Expert Group on the Measurement of Economic Performance and Social Progress at the OECD, and the Chief Economist of the Roosevelt Institute. A recipient of the Nobel Memorial Prize in Economic Sciences and the John Bates Clark Medal, he is a former Senior Vice President and Chief Economist of the World Bank and a former member and chairman of the Council of Economic Advisers and named by *Time* magazine (2011) as one of the 100 most influential people in the world. Known for his pioneering work on asymmetric information, Professor Stiglitz’s work focuses on income distribution, risk, corporate governance, public policy, macroeconomics and globalization.

Dr. Arjun Jayadev is Associate Professor of Economics and Co-Director of the Asian Political Economy program at the University of Massachusetts Boston and a faculty member at Azim Premji University. He is a consultant to the Institute for New Economic Thinking where he is Deputy Director of the Political Economy of Distribution Program.

Mr. Achal Prabhala is a fellow at the Shuttleworth Foundation and the Coordinator of the AccessIBSA project, which campaigns for access to medicines in India, Brazil, and South Africa. He is known for his work on intellectual property rights.



The Curious Case of Patent Balance Sheet Invisibility

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David N. Lawrence, Esq.

Founder and Chief Collaborative Officer of the Risk Assistance Network + Exchange (RANE). Former Associate General Counsel, Managing Director, and Head of Business Intelligence at Goldman Sachs & Co. and Assistant United States Attorney in the Southern District of New York.

PO's and M&A are back on Wall Street, and a slew of tech IPO's at that. And while companies polish their balance sheets in hopes of capital markets success, try as you might a company's patents are virtually invisible on corporate books. Despite this, patents have been identified as potentially playing a key role in invariably promoting or retarding deals subject to regulatory review in cases of technologies critical to national security or in response to public health crises such as by pooling. In the age of transparency, wouldn't it be important to know the economic value of what is at stake? Economically speaking as to patents, if you can't measure it, you can't control it. That is a sad statement to make as to an entire class of modern society's most valuable assets.

Indeed, patent invisibility is all the more puzzling when you consider that, since 1995, the predominant component of market capitalization of companies comprising the S&P 500 is not the green-shade favorite of plant, equipment and tangible assets, but

rather *intangible* assets – generally, intellectual property protectable as copyrights, trademarks – and, yes, patents¹. Trade secret protection for companies remains a viable option – such as the formula for Coca-Cola – yet as between patents and trade secrets, government patent programs incentivize patent protection, and the markets prefer it. Patents in-and-of-themselves may have value for licensing, yet they are at their most valuable when they cover a real economy good or service produced under it, allowing for government sanctioned monopoly profits. Yet, look at any balance sheet of any technology company lining up to go public or even those that have been long public and, with few exceptions, you'll see nary a patent, let alone any disciplined accounting treatment of it.

In the M&A context, particularly when it comes to international investment in U.S. companies that requires approval by the Committee on Foreign Investment in the U.S. (known as "CFIUS"), lack of

“And while companies polish their balance sheets in hopes of capital markets success, try as you might a company's patents are virtually invisible on corporate books”

“While patent licensing is revenue derived from a company’s completely legal means of ordering the market, it doesn’t tell us the ‘price’ or the value of a patent as an asset *per se*. As a result, licensing revenues do not fully inform or provide a price discovery mechanism”

Source: Ocean Tomo, LLC Intangible Asset Market Value Study, 2020
*Interim study update as of 7/1/2020

accounting treatment for patents makes the evaluation of so-called ‘critical technologies’ raising national security issues all the more difficult because it’s unclear how a company values its intellectual property covering those technologies.

Commercially, without transparency as to a company’s marked-to-market reports of what its patents are worth makes concerted collective action – such as standard setting and patent pooling – all the more difficult. Indeed, as Nobel Laurate Joseph Stiglitz suggests on these companion pages, if patent pooling and ready rights access can hasten technologies to the public in response to public health crises, such as the current COVID-19 global pandemic, then transparency as the value of rights contributed to the pool, can promote deal making. In this way, sunshine can be both the best disinfectant and deal-accelerant.

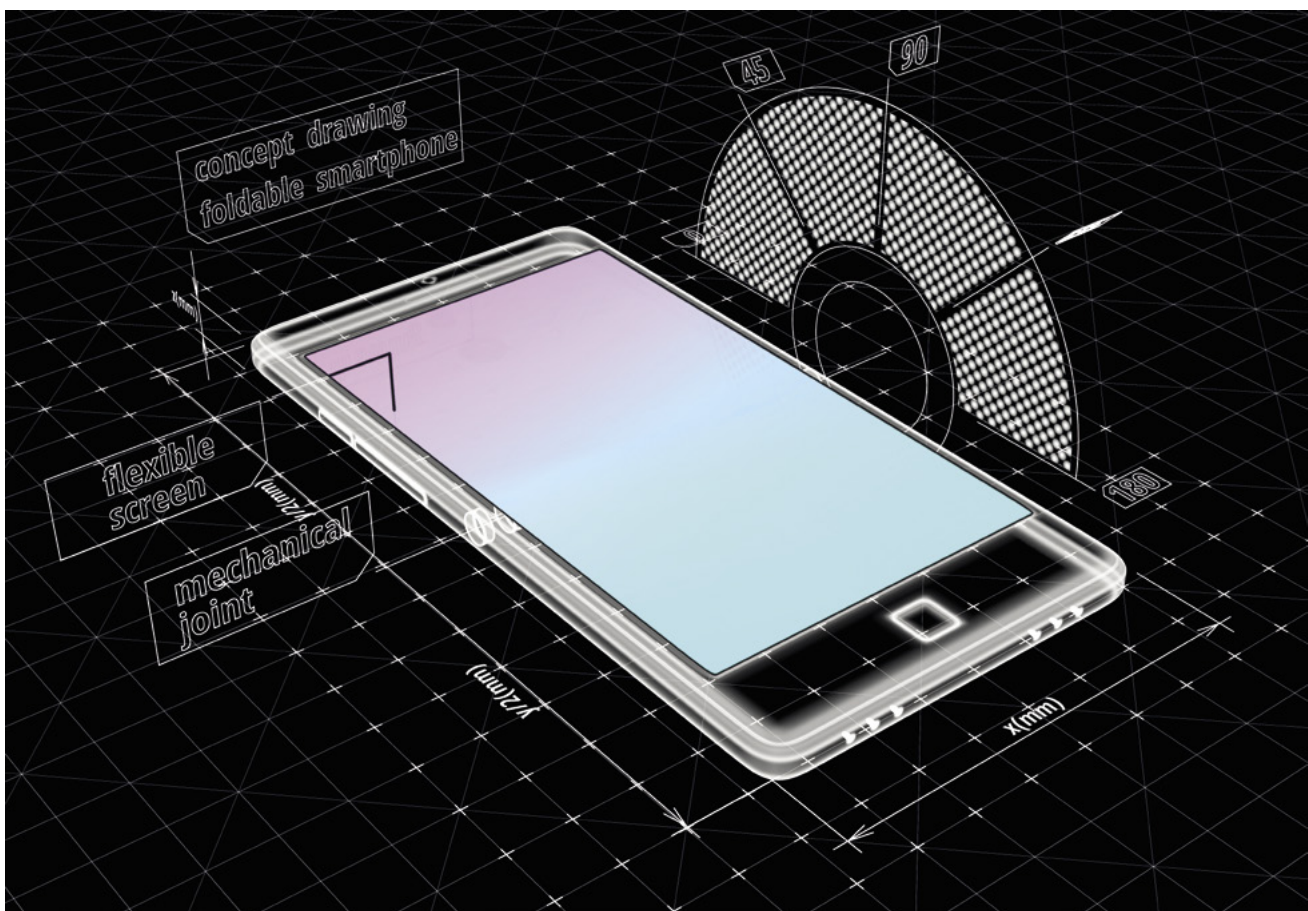
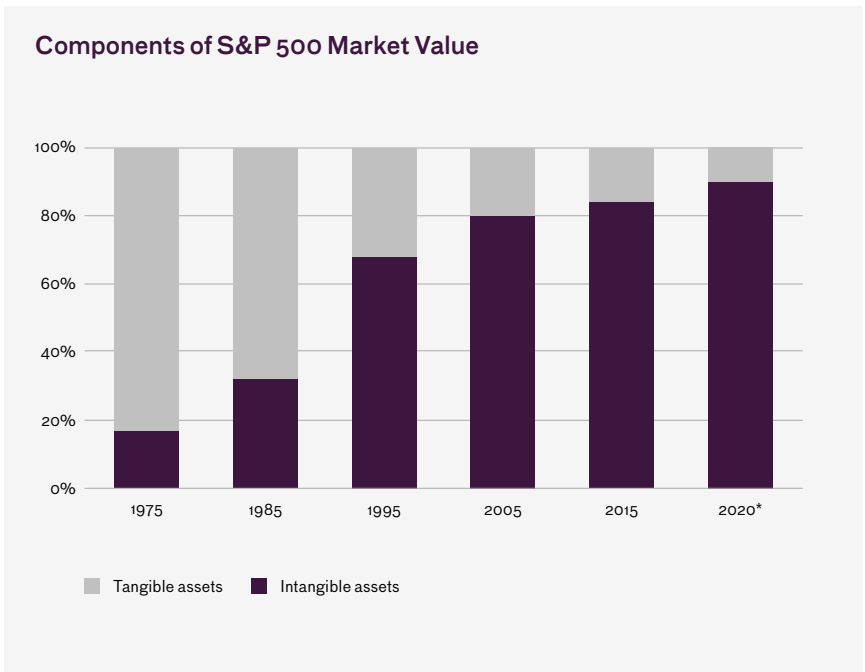
Accountants would tell you that lack of GAAP² standards is the culprit conveniently enough, but to a large extent that merely begs the question. While Wall Street can wax eloquent about strange beasts called non-priced alternative investments, when it comes to patents, accountants and bankers alike are tongue-tied. It is time for that to change.

The Patent-curious Case for Treatment Alternative Investments

Ocean Tomo, an intellectual property merchant bank, has tracked the relative percentage of value of tangible assets (land, plant, and equipment) to intangible assets (copyrights, trademarks, and patents) over the last four decades. The results are remarkable; the inversion of intangible assets overtaking tangible as a matter of corporate value occurred between 1985 and 2000.

Indeed, Ocean Tomo updated its study to account for the measurable economic impact of COVID-19 and found that the pandemic in fact *accelerated* the trend toward intangible assets, with intangible assets now presenting over 90% of the S&P500 market value.

In Asian markets, however, including in China, Japan, and South Korea, their observation has been a decline as evidenced by the Shanghai Shenzhen CSI 300, the Nikkei 225, and KOSDAQ Composite Index, respectively. As to the decline, reporting differences as to COVID-19 cases stemming from various countries and difficulties in economic correlation were noted.



Might such analysis – and even positive collective action, such as pooling, fueled by measurable metrics such as the effect of the global pandemic on intangible assets – be aided by consistent accounting treatment and balance-sheet transparency?

Patents Un-Siloed:

As to patents, some companies, notably IBM, consistently drop billions of dollars in revenue to the bottom line from its global licensing program. As to licensing, legendary IBM, then Microsoft’s IP lawyer Marshall Phelps has famously recounted the story of open innovation and licensing at IBM, whereby he informed his new CEO – Lou Gerstner – that he planned to license IBM’s massive patent portfolio to the marketplace. Mr. Phelps’s team then exposed an IBM laptop circuit board and inserted a flag into every component representing someone else’s patent. Mr. Phelps’s story vividly illustrates the interdependence and interoperability of patents and

products they cover in complex value chains. Mr. Phelps ran out of flags – and room to insert them – at 100.

While patent licensing is revenue derived from a company’s completely legal means of ordering the market, it doesn’t tell us the ‘price’ or the value of a patent as an asset *per se*. As a result, licensing revenues do not fully inform or provide a price discovery mechanism (for example, what if the patents are not licensed?) as to the intrinsic value of the patent – as an asset *per se*.

In the financial world, ‘price discovery’ is normally difficult for alternative assets. For patents, it has been virtually non-existent and that has led to a speculation-laden arbitrage swamp, which in turn has led to the vilification of entities that do not produce products or services under their own patents as ‘trolls’. This is a result where patent holders provide no direct economic contribution at all – where there are no operations directed to real economy goods and services. The U.S. Supreme Court noted this valuation

conundrum well over a decade ago in the U.S. when evaluating the so-called ‘automatic injunction’ rule believed to be the inexorable result of a court finding of infringement. Justice Kennedy noted valuation difficulties in a famous concurrence in the *eBay v. MercExchange* case that:

[i]n many cases now arising... the nature of the patent being enforced and the economic function of the patent holder present considerations quite unlike earlier cases. And industry has developed in which firms use the patents not as a basis for producing and selling goods, but, instead, primarily for obtaining licensing fees.

In more mature and research development intensive industries – such as manufacturing or pharmaceuticals – patent valuation tends to bear a tighter correlation to economic value. But in less mature and especially more ‘hard’ and ‘soft’ technology-intensive industries, the economic equation – even if ➡

there is one – falters and remains virtually balance-sheet invisible as a corporate intangible asset.

If patents are to be considered an asset, then they are an asset that is off-balance sheet and, non-priced, as an “Alternative Asset,” one that does not conform to traditional asset class notions like stocks and bonds. Because alternative assets are not very liquid, valuation can be difficult.

An Investment Lens For Patent Transparency

What makes patents ‘alternative’ in the realm of financing is their nature as a legal property right of sorts. To enforce a patent is to incur steep litigation costs to try your action in court and hope for a favorable but *post-facto* infringement determination by a deciding court.

If a patent holder successfully enforces its patent, notably the legal ‘valuation’ occurs AFTER – sometimes years – a trial on the merits.

As a result, early notions of this time-warped ‘patent market’ looked and felt like an enormous arbitrage play. That is, with the sticker-shock-high cost of patent litigation and the inherent *post-facto* timing of a court outcome, patent market ‘forces’ remain untethered to any real economy underpinnings.

Currently, however, banks, private equity players and hedge funds have started to provide financing strategies which move beyond royalty securitizations and treat, deploy, and realize sustainable returns on patents as assets-*per se*. For example, patent-backed loans can be structured due to a better, up-front and more ‘market friendly’ valuation mechanism – based upon credit-return models – to become effectively more ‘liquid.’

“
As to promoting desirable collective behavior, such as cross-licensing or patent pooling, a GAAP-like, consistent accounting treatment would provide a market-based view and valuation of the patent rights being contributed
”

Models are being developed that analogize patent rights asset as a quasi-financial instrument in and of itself. The instrument? Well, derivatives, of course (this is Wall Street, after all) since the very essence of patent is that it *derives* its value from its enforceability against real-economy produced goods and services.

Such market-friendlier monetization alternatives have become available because patent-as-derivatives can be valued *in absentia* of a transaction. This approach relies on market forces and calculating compensation to the patent owner. The patent maps (recall Mr. Phelps’ flags) that need to be created for patent valuation can and should highlight the correlation between the ‘patent rights world’ and the ‘real-economy’ goods and services world that patent claims cover. If this is done right, then better patent ‘price discovery’ and market efficiencies will result since such a mapping process ‘prices’ patents granularly relating to specific claim sets’ derivative-based fundamentals (that is, the real-economy value driver).

This in turn would beget more consistent accounting treatment and allow for more balance-sheet transparency of intangible assets. And this would benefit investors not only in U.S. public companies but also corporate deals on the international front.

Particularly with the U.S. and China international agreements as to intellectual property, patent balance-sheet transparency could aid in U.S. CFIUS review of international mergers, acquisitions or takeovers by enabling better determinations of the drivers of the deal rationale. With such transparency, valuation could become more standardized as to the illusive intangible assets that patents represent.

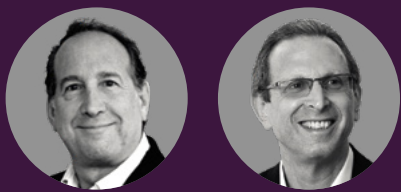
This, in turn, could aid in determining more precisely national security risks as presented by investment and exactly which intangible assets are valuable and to what extent by the putative international investor.

Finally, as to promoting desirable collective behavior, such as cross-licensing or patent pooling, a GAAP-like, consistent accounting treatment would provide a market-based view and valuation of the patent rights being contributed. The market confidence that would arise from such valuations would reduce deal friction by promoting transparency and tighter correlation as to both rights and hard technologies pooled.

Consistent balance-sheet accounting treatment of patents as corporate assets would increase comfort and confidence across the board, be it in a CFIUS review or a pooling negotiation. It would provide current, market-based information that has heretofore been largely guesswork. ■

¹ Ocean Tomo report: <http://www.oceantomo.com/intangible-asset-market-value-study/>

² Generally Accepted Accounting Principles: <http://www.investopedia.com/terms/g/gaap.asp>



About

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Artificial Intelligence: Sifting the Facts

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Professor Kartik Hosanger
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The Surprising Role that AI Plays in Management

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Overview

Our *Deep Innovation* section frames questions related to technology-led transformation. In this issue, we address artificial intelligence, and dig deep into an innovation characterized by a lack of consistent understanding about what the technology is, including discussion on the potential benefits and risks.

In a spirited interview, we are joined by two leaders in the field: Kartik Hosanagar, the John C. Hower Professor of Technology and Digital Business at the Wharton School of the University of Pennsylvania; and Aya Soffer, Vice President of AI Tech at IBM Global Research.

The section is complemented by a commentary by Lior Zalmanson and Gal Oestreicher-Singer, both faculty in Technology and Information Management at the Coller School of Management at Tel Aviv University. Their discussion clearly underlines both the technical and management challenges of bringing ground-breaking artificial intelligence applications into practice.

Together, our contributors clarify an important emerging technology, the advantages it promises, and the reality in practice.

Looking forward, it seems clear that the tension between reality and practice, between reality and future promise, are related to many technologies beyond artificial intelligence. Future versions of *Deep Innovation* will continue to bring together varied perspectives on such new technologies, with the aim of promoting new syntheses and insights.



Artificial Intelligence: Sifting the Facts

Artificial intelligence continues to attract strong interest from investors and entrepreneurs alike, even during the global pandemic. But where is the sector headed? Which recent developments have been most overhyped or underplayed? In this AI Roundtable, *Coller Venture Review* speaks with IBM’s Aya Soffer and Wharton’s Kartik Hosanagar to do a reality check.

Despite the global COVID-19 pandemic and economic crisis, artificial intelligence (AI) continues to attract strong interest from investors and entrepreneurs alike. According to CB Insights, a New York City firm that monitors startups and venture capital, while AI deals declined in the first quarter of 2020, funding “jumped by 51% from the previous quarter to hit \$8.4 billion.” Successful IPOs by AI-powered startups such as the insurance firm Lemonade—whose market cap soared to \$3 billion when it went public in July—have added more sizzle to the sector.

As this momentum continues, several questions arise about AI and where it is headed. Among them: Will AI be as transformational as, say, mobile or cloud computing? Which recent developments in AI have been most overhyped or underplayed? What challenges in AI deployment are unique to enterprises as compared with consumer applications?

Coller Venture Review discussed these questions and more at a recent AI Roundtable meeting with Dr. Aya Soffer, Vice President of AI Technology at Haifa Research Lab in Haifa, Israel, and Professor Kartik Hosanagar, John C. Hower Professor of Technology and Digital Business at the Wharton School of the University of Pennsylvania, who oversees the school’s AI for Business initiative. Dr. Leslie Broudo, Head of the Coller Institute of Venture at Tel Aviv University’s Coller School of Management, moderated the conversation. Following greetings and brief re-introductions, an edited version of the discussion appears below.

This article is associated with a companion piece by Dr. Lior Zalmanson and Professor Gal Oestreicher-Singer, both lecturers in Technology and Information Management at the Coller School of Management at Tel Aviv University. ➡



“
AI touches almost everything we do from the core of creating the technology all the way to user interfaces

” Aya Soffer

Broudo —

Will artificial intelligence be as transformative as mobile or cloud computing?

Soffer —

I think AI will be as transformational as mobile and cloud computing but maybe in a slightly different way. That is because AI touches everything. Part of the transformation in cloud and mobile—and enabling all that—is due to AI. AI is the underlying capability that has made all these things transformative and will continue to do so even more moving forward.

If you consider mobile, there are things we like and others that we may not like as much but are very

necessary. One reason that mobile has taken off more than we had envisioned is because we can now know people’s locations. That is AI in the mobile environment. That is why “mobile” technology can now provide users with an experience that is personal. Even though sometimes we are surprised (or possibly dismayed) at how much these technologies know about us, that is what makes them extremely useful. That is on the front end.

If you think about the back end, AI holds the key to a lot of what we see that enables the miniaturization of mobile devices and what we see on how the cloud runs. We use AI to make sure the cloud is running smoothly; we use AI to predict failures and fix them in advance. In my view, AI touches almost everything we do from the core of creating the technology all the way to user interfaces. In the future AI will be even more transformative when it will allow everyone—even those without computer skills—to interact with technology.

Hosanagar —

If we rewind back the last 20 to 25 years, we can look at technologies that have had a huge impact on business and society, such as the Internet, the Cloud, and Mobile computing. There also have been other technologies that may have received a lot of hype but which have failed to deliver. To me, AI belongs in the first bucket with the Internet and Mobile computing.

When we ask whether AI belongs in one bucket or the other, I think about it in a couple of ways. First, how relevant is the technology across multiple industries or modes of our life. On this count, AI is fundamental. We see AI applications in health care, finance, education, professional services, manufacturing, retail and so on. The scope is extremely broad. Second, over the last 20 years we have seen an explosion of data in all aspects of our lives. We could not have mined that data 20 or 25 years ago. Now, we not only have data generation happening at an amazingly fast clip, but we have also seen machine learning progress so much that we can analyze that data and make sense of it.

A lot of factors have come into play at the same time, ranging from data generation to data processing to progress in machine learning algorithms to the fact that this is happening across industries. If you look at Cloud

or Mobile or the Internet, they have been transformational in terms of touching many industries and many aspects of our personal lives. AI is similar. It is advancing so rapidly that there is little doubt in my mind that it is significantly transformational.

Broudo —

To summarize, from both your perspectives—the technology-enabling component and the change in industries it is affecting—you believe that AI is highly significant. When you read the popular press coverage of AI, what do you think is being overhyped? And what is being downplayed to the degree that we do not appreciate what is going on?

Hosanagar —

If we look at the popular press, I believe where there is lack of understanding is the view that AI is almost magical and sentient, and it can be viewed in the same way as human intelligence. There is also this concept of super intelligence. In reality, AI today is what we can refer to as weak AI or artificial narrow intelligence. That means we give a machine learning algorithm good data on one specific task and we can figure out the patterns that allow us to make predictions on that task. For example, we can give data on whether an email is spam or not, and it can do a great job of figuring that out. But that does not mean it can be truly intelligent and transform itself into a robot that starts moving about in the physical world. You might have an autonomous vehicle that drives around, but that does not mean it can do other things. That is where we are.

Sometimes, when you read articles in the popular media, you start to see the discussion around AI suggesting that we have created something that is truly intelligent and mimics human intelligence. We are nowhere near that. We might get there in the future but we are not there yet. Similarly, there is a misperception that AI can beat doctors or trump their medical knowledge. Here, too,

AI is good at narrow tasks such as reading X-rays and other such tasks in radiology. But to believe that AI is smarter than doctors makes it seem like general intelligence, which it is not. That, to me, is the biggest myth that needs to be exploded.

Soffer —

I whole-heartedly agree with Kartik. This is a question I get a lot. People are so anxious about AI. Will it make decisions for us and take over? People get these ideas when they read the popular press. Then you go to the lab and see the gap between what they believe to be close to general intelligence and where we really are. That is what I think is overhyped.

Recently an idea that has received a lot of coverage in the popular press concerns a text generator—GPT-3 (generative pre-trained transformer), as it is called. The risks of this technology relate to what has come to be known as deepfakes. These things, on the surface, can seem very real—and that is why they are overhyped and get a lot of attention. It seems like a computer can write a poem or a news article. There have been a lot of articles about that.

When you look at what the computer is doing, you can see that it is not truly intelligent as we think of intelligence. But it is getting there, and it raises what I think are interesting questions about what intelligence is. Anybody who understands the technology behind it knows that it has ingested so much information that no matter what you ask, it can come up with what seems like a reasonable answer. That happens until you start asking it things it does not know. That is when you see that its response is nonsensical.

I do think something interesting is happening, and a lot of it is exciting. But on the other hand, it is far from what we would consider intelligence in the sense of understanding the rules or laws of the world

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and being able to reason or reach conclusions in a meaningful way. It is confusing, in that sense.

Broudo —

To turn now to the second half of the question, what are we not seeing? What do you think is around the corner, that people are not seeing yet and is getting lost?

Hosanagar —

For me, that would be the fact that when you look at AI, in practice, 90% of it is machine learning—and 90% of that is supervised machine learning. That is the idea that you have massive data sets which relate to what you are trying to predict. You learn from those data sets so that you can start making predictions. One of the exciting things that could happen is that there are other approaches as well. One of them, for example, is reinforcement learning. That is the idea that an AI system observes what happens and learns from it—and you do not need massive data sets to do that. The idea that you can create intelligence without massive training data sets is interesting. Reinforcement learning has been around for a long time—but in terms of industry applications and business settings in which it can be used, those are not as well understood. ➡

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Aya Soffer

Supervised machine learning is focused on its learning from the past, where lots of historical data exists. In contrast, reinforcement learning is about acting after observing what happens, and it allows us to learn from the past without training data. For example, imagine drug discovery. You could apply this concept to find drug molecules in situations where you do not have much training data. There are many interesting applications. The idea that you can learn even in situations where we do not have a lot of data from the past is super interesting.

Soffer —

To me, the future developments that look promising are in what people are calling neuro-symbolic AI. If we look at the history of AI, originally the concept was that we were somehow going to codify all the knowledge in the world. We had expert systems, we had logic reasoners, but that never really took off because it is impossible to codify all the world's knowledge and rules. Plus, it does not scale because it is hard to prove these things.

Instead, along came the paradigm of machine learning, which has turned out to be highly successful.

This was because, as Kartik has pointed out, it dealt with narrow tasks where, with enough examples, we could predict or classify things in a fairly good way. However, the issue we have today is that it is impossible to machine-learn everything.

First, this is because we do not have all the data; and second, because some things are much too intricate. This is also how we learn as humans. We learn some things through patterns: If you see enough images of cats, you know what a cat is. Second, we learn other things because we go to school, and somebody explains them to us. If you are taught that a cat goes “meow,” you know that a “meow” sound means a cat. Where we need to go now is to combine these two.

The neural architecture and machine learning can help us to learn better. We can use neural networks to perform logical reasoning on the data in the knowledge bases. That is what will help us go to the next level of being able to understand language as well as rationalize and reason. Adding knowledge and rules is where we want to go.

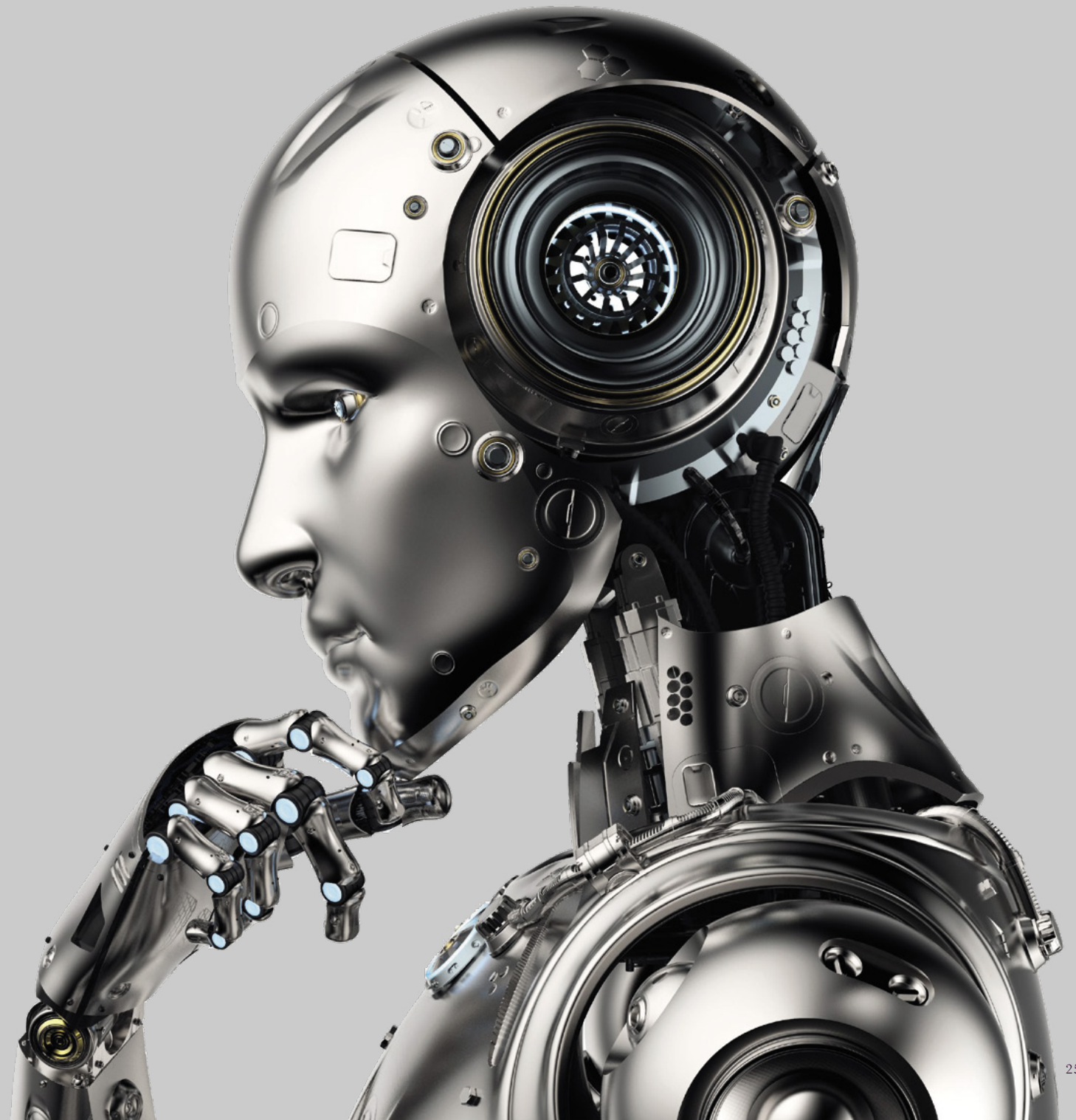
Broudo —

What challenges in AI and its deployment are unique to enterprises as opposed to AI in consumer applications? What critical differences should we be aware of when we think about AI in the B2B model versus the consumer model?

Soffer —

We at IBM work predominantly in the B2B model, so I will tell you what I have observed. The first thing to note is that B2B is B2B2C eventually. When you deal with businesses, you realize they have many issues around deploying AI. They care a lot, of course, about the outcome but they also care about the infrastructure. For example, questions can come up, such as, “How much it will cost to run AI?” or “Will those costs create enough value compared to the alternative of not running AI?”

A lot of economic considerations come up because running AI not only requires a lot of data but also computing power. It is important to understand the KPIs or key performance indicators around AI. It must deliver outcomes that are accurate, and it is equally important that AI must help a





company achieve its goals. The goals can range from functional ones—such as increasing sales—to non-functional ones, like the necessity to invest millions of dollars in computer farms. Those are some of the practical aspects.

Such considerations make AI deployment different than software engineering. How to deploy new software is relatively easy and now well understood; with AI, that is not yet well understood. We have this notion of AI life-cycle management. You train your models on data, then you test them—though no one knows yet how to test AI the way you test software. Unlike software, the performance changes if the data changes. In software engineering, the software does not change with the data. But in AI, if you have new data with other statistics, your models may no longer be relevant. These are some of the issues around deployment.

Another area I would highlight is explainability. For example, if a

borrower has been denied a loan [based on an AI recommendation], we must be able to explain why the loan was turned down. Companies are not happy with black-box AIs. We may develop more and more sophisticated black box neural networks, but people tell us, “No, please bring me back my rules and things that I can explain to people.” There is friction between what businesses want and feel comfortable with, versus the way AI really works. That makes it harder to deploy AI at the enterprise level.

Hosanagar —
Aya mentioned that B2B is often B2B2C. I would like to add a point from the end-user standpoint—whether that user is sitting in an enterprise or at home. An interesting question that often comes up is what it will take for that user to trust AI. Would a doctor be willing to trust the judgment of a diagnostic AI or would end-consumers be willing to trust a prediction from an AI system and apply it to their

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life? That issue has not received as much attention as it deserves.

In fact, several studies in the social sciences and psychology show that people tend to have some algorithm aversion, especially when they see an algorithm fail. And no AI is a perfect system. It might on average be better than human performance, but an AI system can go wrong. How will people react when it fails?

Aya brought up explainability, but if you don’t even understand the system and you have seen it fail and you continue using it, what will it take for such an AI system to be adopted? Do we know if it is performing universally well for all people? Maybe it is beating lay people, but it is not beating experts. Some questions that relate to human psychology will start to matter a lot when it comes to designing the interface between humans and AI. It will also matter what information is shared with humans and what information is withheld to make it easy for them to understand and encourage adoption.

Broudo —
We turn now to natural language processing (NLP). Where is the field headed in the next couple of years? Why does it stand out in your mind as an area we should care about?

Soffer —
Let me begin with the second question about why we should care about NLP. Most of AI today is machine learning and analytics, but AI is about machines exhibiting

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” **Kartik Hosanagar**

behavior that seems intelligent. If we look at human beings, what differentiates us from others and what makes us intelligent is the ability to develop human language to communicate. That is part of everything we do—whether we are talking with our family at home, in school getting an education, or at work. With a machine, that is not the case. I believe that as the field of AI matures, it will help machines to communicate with people using plain language. That will create the ability for every single person on earth to use computers and language. Humans can communicate through language by the time they are two years old, but computers still cannot do that.

The question that arises is, why has that been so hard? Where are we on the journey of trying to do better? Anyone who has used personal assistants [such as Alexa, Siri, etc.] or chatbots can understand that those programs are codified. They provide responses based on simple questions. That is where we need to go.

Technology in recent years—like GPT-3, which I mentioned before, which again stands for generative pre-trained transformer—has taken a big step forward. It can help with understanding words that are used in a certain context, but it does not help with the nuances of the language. That takes us back to the challenge of reasoning. That is what we will have to do to crack language. ➡

I do not think you can learn a language just by seeing more and more examples [of how it is used]. Reasoning in a meaningful way cannot be learned simply by crunching more and more data, but that will be necessary before computers can converse with us. Ultimately, natural language interfaces will do everything we do and completely change the way we interact with computers. For example, if you are a doctor, the computer should be able to recommend the next thing to do to help the patient. And it will also have explainability; the algorithm will be able to explain itself. It is all about understanding and generating language. Like AI, it will impact many applications in many industries.

Hosanagar —
I agree with everything Aya said, including what she said earlier about GPT-3 and the progress being made. It is an extremely exciting space—and one in which we will see a lot over the next few years.

Broudo —
In September *The Guardian* published an opinion piece titled, “A Robot Wrote This Entire Article. Are You Scared Yet, Human?” The newspaper claimed that the article—which was generated by GPT-3 — took less time to edit than many human op-eds. Is that why there has been such a buzz over GPT-3 compared with other instances of natural language generation? Where are the limits to what these technologies can do?

Soffer —
The reason people are paying more attention to GPT-3—compared to the previous version GPT-2, which was also amazing—is because of the amount of data it was trained on. Its full version has a capacity of more than 175 billion machine learning parameters. As a result, it can generate language that on the surface seems very natural. That is the reason why it has received so much attention. But if you were

to ask the algorithm to write about something new—such as COVID-19, before the pandemic was out there—it would not be able to write about something it did not know. It would not be able to write about a new vaccine, for example. It cannot do that. You would have to reprogram it with many, many articles about COVID-19 before it could write an article about COVID-19.

One strong feature of GPT-3 is that it has been able to pick up style. That is why people are getting excited about it. But several articles about GPT-3 have also pointed out its deficiencies. Often the words make sense, but the content does not always make sense. It is written in exceptionally good English, and it sounds like something that a highly educated person might write, but that doesn’t mean the content itself makes sense. It is interesting, and we will see where it goes. On the syntax, GPT-3 is excellent. On the semantics, it is still lacking. Still, it is a powerful NLP tool that will help us build better systems in the future.

Hosanagar —
In practice, creativity often means combining things in interesting ways. We should not assume that these systems are unable to come up with things that are novel and even creative. They will combine things in interesting ways. The scope of their creativity may be limited, but that is not in the same way that a lay person looking at it would rate it as being creative or not.

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” **Aya Soffer**

A problem with these systems sometimes is that each sentence may make sense, but the paragraph may not make sense. At the same time, if you know what you are doing, you may be able to fine-tune GPT-3, give it very specific training data, and then tune it to produce the kind of result you want. If you think in a very narrow, targeted manner, you may be able to get it to do the kind of writing that seems almost human.

Broudo —
Kartik, since you are in the entrepreneurship space, how do you view investors’ approach to AI? Does every deal have to have an AI component? If so, does it drive a higher valuation? How well does the startup world understand AI, and is that different than what you have seen before?

Hosanagar —
AI is a big buzzword in the startup world. If a startup claims to have AI, that bumps up its valuation and increases the chances that the venture will be funded. As a result, lots of startups claim to have AI. When I said 90% of AI today is machine learning, I should have clarified and said that 90% of real AI is machine learning. The truth is that 90% of what passes for AI is not really AI—people claim that everything is AI if it touches data even slightly. A lot of that is going on.

That said, however, investors are starting to get savvy about AI. Some AI-specific venture funds have been created; some of them invest only in AI startups. As this happens,

I believe we will see more maturity in the market. Some investments are being made in pure-play AI startups—but those are becoming increasingly hard. Large players like Microsoft, Amazon and others are creating AI-enabled tools and giving them away almost for free as part of their cloud infrastructure. A startup that comes in with a horizontal AI application that can be applied across many industries will find it increasingly difficult [to generate revenues]. If Google or Amazon comes along with a free AI product as part of its cloud infrastructure, then it becomes extremely challenging for a startup in that space.

As a result, while there are some startups in the horizontal space, more are coming up in the vertical space and bringing AI to deal with a specific problem. For example, it could be AI for a personalized medicine application or for fraud detection in the credit card industry. We see a lot of that kind of activity. That is a little more defensible for the startup.

Broudo —
Aya, is IBM buying some of these startups? Do you see value in investing rather than

building? If so, what kind of companies are you looking for?

Soffer —
Generally speaking, many startups are building horizontal capabilities or tooling for the AI world. I agree with Kartik that they will find it hard to remain independent and grow that business. Companies want to run their AI on the cloud or the hybrid cloud, which is a combination of on-premises (or private) cloud and the public cloud. On the other hand, there are many ways a small company can innovate faster than a big company can. I do believe these smaller companies will be absorbed eventually by some of the larger ones. Eventually these capabilities may become part of the big platforms. The startups that will become large in AI will be those that focus on specific industry use cases.

Broudo —
Finally, as a last question: Investors can throw their money in places that change our world but one could say there is no clear governing authority. What should guide us in the absence of global standard rules?

Soffer —
Education is important; I would augment that with transparency. Regulation may help AI to become more transparent so people can make better decisions. In IBM, specifically, we are doing our best to pursue an idea—in partnership with other companies, of course—that we call AI FactSheets. If you think about nutrition labels for food, those were not there in the beginning. Over time, more and more regulations dictated that companies had to display labels on food packaging so that people could know what they were eating or drinking. Similarly, with AI factsheets, we will have a form that says you need to describe your model, how you trained it, how accurate it is, and things along those lines. That transparency, which is something that can be regulated, will let people know what is healthy and what is unhealthy in the ➡



“ Governments must start getting savvy about how AI can be regulated without stifling what is innovative

” Kartik Hosanagar

consumption of AI—just as they do today with food consumption—so that they can make better and more informed decisions.

Hosanagar —
We spoke about how AI can be transformative, and it is progressing at a rapid pace. We also discussed how we are in a world of artificial narrow intelligence and are inching towards general intelligence. We are going to have situations where AI can be used for good, but it can also be used irresponsibly.

Aya mentioned technologies such as GPT-3 and the fact that in the wrong hands, fake news articles can be produced at scale without any human beings being required to generate them. Photos and videos can be doctored to produce deep fakes. There is also the business of using AI for loan approvals or in the judicial system to make parole decisions. We do not need someone to have nefarious intentions for things to go wrong. All that is required is a slight oversight—and you may end up with a biased algorithm that makes discriminatory loan decisions that impact millions of people. It is not that humans are not biased; I do believe that, on average, AI will be less biased than humans. A biased judge might affect the lives of 200 or 300 people; a biased HR manager may make poor decisions about a few thousand people; but if an AI system is deployed to make decisions at scale, bias in those decisions may impact millions of people.

I do believe we need governance standards. The industry is participating in forums such as Partnership on AI to discuss best practices. My observation is that scientists from leading companies are coming together to discuss how to use AI responsibly. Still, when push comes to shove and decisions are made higher up in these organizations with a view to meeting quarterly targets, some of these conversations might not matter.

The governance frameworks should not be limited to companies self-regulating, in my opinion. Governments must start getting savvy about how AI can be regulated without stifling what is innovative. This will require participation by consumers, who will need to be educated about the technology and its risks. AI should be part of the curriculum in schools, so people understand what AI is and what it can and cannot do. For example, if they apply for a loan, they should know what assumptions have been built into an automated system. Or, if they read an article online, they should know how to assess whether the information they are consuming is truthful. Most importantly, education will need to change so that people know how to function in a world where AI is an active participant. ■



About

Dr. Aya Soffer is VP of AI Technologies for the IBM Research AI organization focusing on natural language understanding and conversational systems and their application in customer care and other enterprise applications. In this role Dr. Soffer is responsible for setting the strategy and working with IBM scientists around the world to shape their ideas into new AI technology, and with IBM’s product groups and customers to drive research innovation into the market.

In her 20 years at IBM, Dr. Soffer has led several strategic initiatives that grew into successful IBM products and solutions in the Big Data and AI space including the original Watson system and more recently Project Debater. She has authored over 50 peer-reviewed papers and served as an invited speaker in numerous conferences.



Professor Kartik Hosanagar is the John C. Hower Professor of Technology and Digital Business and a Professor of Marketing at the Wharton School of the University of Pennsylvania. His research focuses on the digital economy, in particular the impact of analytics and algorithms on consumers and society, Internet media, Internet marketing and e-commerce. Professor Hosanagar serves as a department editor of Management Science and has previously served as a Senior Editor of *Information Systems Research* and *MIS Quarterly*.

Professor Hosanagar cofounded and developed the core IP for Yodle Inc, a venture-backed firm that was acquired by Web.com.

The Surprising Role that AI Plays in Management

Dr. Lior Zalmanson

Senior Lecturer of Technology and Information Management, Collier School of Management, Tel Aviv University

Suppose we are to form our AI business strategy based on how Artificial Intelligence is being portrayed in popular media. In that case, we will probably be limited to one of the two common notions. The first is AI as a servant, embodied in the human environment through robotics, helping humans in their daily needs. The second is AI as a superintelligence, a replacement for any human, an all-knowing being, controlling and overseeing anything and everything. However, the notions and roles that AI will probably play in our society, as discussed by Aya and Kartik in the Roundtable, are very different, and in a way, much more interesting.

Research conducted at the Collier School of Management at Tel Aviv University might shed further light on the matter, particularly as related to a set of practices also known as “Algorithmic Management.” In this type of management, algorithms take over the traditional roles of middle management. This term doesn’t represent a futuristic scenario. For Uber drivers, for example, this is very much a current reality. Such drivers work under tight supervision by a machine learning algorithm, guiding their actions and sanctioning them if they do not follow the firm’s policy. They do not have

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other direct bosses and officially are not even considered employees but rather freelancers. In reality, however, they are being managed by artificial intelligence algorithms.

When AI algorithms become “your boss,” new tensions emerge. Drivers experience tensions related to the manner they conduct work since, on the one hand, they are autonomous agents who choose to work at will. ➡

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As COVID-19 provides a catalyst for remote work, many firms will have to decide how they control work from afar. It is likely that we would see different implementations of AI algorithms taking middle management’s traditional roles

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On the other hand, they are being surveyed and micromanaged by pervasive technology. Drivers enjoy the reliability of AI algorithms that constantly match them with riders but at the same time feel frustrated from the lack of transparency of the complex algorithmic calculations which are in charge of their wages. Working under algorithms means personalized treatment and a lack of solidarity as any worker is being treated differently based on their unique case history. In the end, many drivers reported feeling isolated and “robot-like.” They resorted to ad-hoc online communities to socialize and try to make some sense of these algorithms and their behavior. In some cases, drivers even go further and choose to reject and revolt against the algorithms by blocking or gaming them.

Thus, a firm that chooses to manage by AI algorithms shouldn’t rush to take the human element out of the equation. Over the 20th century, we learned the importance of investing in human resources. The support,

guidance, mentoring, and rapport between humans is not likely to be replaced soon by machines. In ride-hailing, drivers seem desperate for voice support, precisely when they run into tension-inducing situations that the algorithm cannot solve. In those cases, drivers appreciated the fact that the firm has built a 24-7 human-led support line for them.

It is important to note that algorithmic management isn’t restricted to these new gig workers. As COVID-19 provides a catalyst for remote work, many firms will have to decide how they control work from afar. It is likely that we would see different implementations of AI algorithms taking middle management’s traditional roles. Therefore, the tensions observed in the Uber drivers’ research are likely to be expected in these future scenarios.

However, even if many firms won’t adopt AI as bosses, they might install them in the role of non-human workmates. In their research, Erik Brynjolfsson and his colleagues at MIT note that most current occupations won’t be replaced by AI (or specifically, as Kartik and Aya mentioned, machine learning) but instead the augmented and re-engineered by the introduction of such capabilities. Humans and AI will not work as substitutes but rather complement each other’s weaknesses. Thus, the burning question is how to design, engineer, and manage these new human-AI work hybrids.

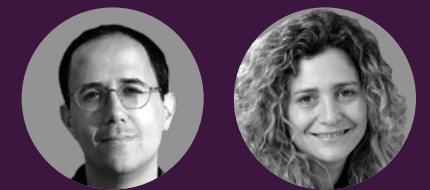
In an ongoing research project, Lior presented in the international conference of information Systems (together with a Ph.D. student, Yotam Liel), we study the risk of humans blindly conforming to the algorithms’ decisions without properly weighing them against their better judgment. The paper follows Salomon Asch’s seminal conformity research in which

“There are great possible benefits of human-AI collaboration for optimal decision making; however, if humans conform to AI decisions without exercising their judgment, the results could be anywhere between sub-optimal to plain dangerous”

he brought participants to a class and gave them simple perceptual tasks. When participants were alone, they gave correct answers quickly. Still, when he added other “fellow participants” who cited wrong answers aloud, many participants confirmed the majority decision and shared the same erroneous responses.

Our research finds that the same phenomenon is at play in the encounter between a human worker and an AI agent. In this case, the presentation of an AI’s advice changed the worker’s answer in a statistically significant number of cases (15-25% compared to always answering correctly in the control group). When we presented them with multiple AI agents, all citing the wrong advice, the percentage grew even higher. These findings provide a warning sign regarding the design of human-AI hybrid decision-making processes and calls for better work processes. There are great possible benefits of human-AI collaboration for optimal decision making; however, if humans conform to AI decisions without exercising their judgment, the results could be anywhere between sub-optimal to plain dangerous.

In this aspect, we agree with Kartik’s notion that “AI can be used for good, but it can also be used irresponsibly.” Behind the words “use” in this case lies more than AI’s purpose and work context. Putting AI to good use means designing responsible and transparent AI processes with humans in mind. ■



About

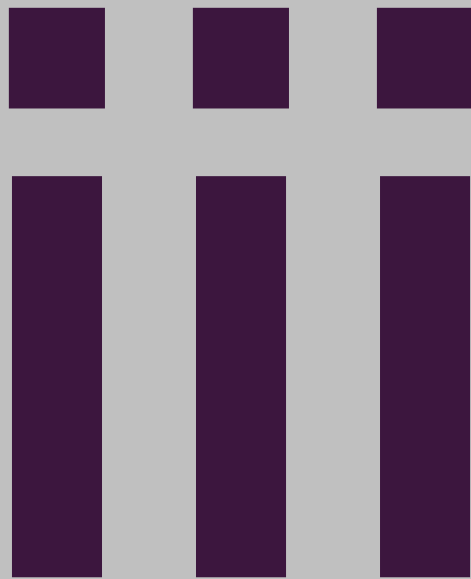
Dr. Lior Zalmanson is a Senior Lecturer of Technology and Information Management in the Collier School of Management at Tel Aviv University.

Dr. Zalmanson’s research focuses on online engagement and commitment, the sharing economy, algorithmic management, and the future of work. His award-winning research has been recognized by and received grants from the Fulbright Foundation, Google, Marketing Science Institute, Dan David Prize, and has been featured in Fast Company and across Israeli media.

Previously, Dr. Zalmanson was a research fellow at the Metropolitan Museum Media Lab and a visiting Assistant Professor at NYU Stern.

Professor Gal Oestreicher-Singer is a Professor of Technology and Information Management in the Collier School of Management at Tel Aviv University.

Professor Oestreicher-Singer’s research focuses on the effects of social media, consumer engagement and peer influence on electronic commerce. She is a recipient of the prestigious Sandy Slaughter Early Career Award and of the European Research Council Grant in 2018. She serves on the editorial boards of *MIS Quarterly*, Information Systems Research and Management Science.



Virtual Roundtable The COVID-19 Crisis for VC – Death Knell or Springboard?

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How the COVID-19 Crisis Ignited and Accelerated Venture Capital

Fiona Darmon

*General Partner,
Jerusalem Venture Partners*

Felda Hardyman

*Partner, Bessemer Venture Partners
Professor of Management Practice,
Harvard Business School*

Shai Bernstein

*Associate Professor in
Entrepreneurial Management,
Harvard Business School*

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A New VC Fund Rides the Silver Tsunami

Abby Levy

*Managing Partner & Co-Founder,
PrimeTime Partners*

Overview

Our *Virtual Roundtable* brings together global leaders and thinkers from top venture capital funds to address an area of significant change in venture, innovation, and entrepreneurship. In this issue, we examine the early stage funding ecosystem, and the ways in which leading funds are meeting the imperative to adapt and are being transformed.

In this discussion, we bring together leaders from Jerusalem Venture Partners, Bessemer Partners, and PrimeTime Partners. Fiona Darmon (Jerusalem Venture Partners) and Felda Hardyman (Bessemer Partners) are long-time investors who share their views in weathering through another storm to bring forward the next round of startup innovation. Abby Levy, leading a new fund with veteran investor Alan Patricof, adds valuable insights on the opportunity for startup capital to chart a new investment niche in the senior market, led by a team of diversified talent.

Each of these individuals' perspectives, responding to what is both specific and general in the changing economic and social context, helps us to consider the profound ways in which the theory practice of entrepreneurship and innovation are informing one another. Looking forward, future discussions in the *Roundtable* section will continue to bring together partners and collaborators active in forging our new venture ecosystem.



How the COVID-19 Crisis Ignited and Accelerated Venture Capital

Fiona Darmon
General Partner,
Jerusalem Venture Partners

Shai Bernstein
Associate Professor in Entrepreneurial
Management, Harvard Business School

Felda Hardyman
Partner, Bessemer Venture Partners
Professor of Management Practice,
Harvard Business School

Based on the experience of the financial crisis of 2008, many feared that last year’s coronavirus pandemic might devastate the world of venture capital. Instead, the industry is booming and changing, according to Harvard’s Shai Bernstein, Bessemer Venture Partners’ Felda Hardyman, and Fiona Darmon of Jerusalem Venture Partners. The three experts participated in a virtual venture capital round table organized by *Coller Venture Review*.



When the COVID-19 pandemic struck in early 2020, countries around the world went into lockdown, unemployment soared, and stock markets initially tanked in March and April. It seemed at that time that the double whammy of the health crisis coupled with the economic shock might devastate the world of venture capital investment. Much to the surprise of those who had expected a replay of the Great Recession of 2008, that did not happen. Felda Hardyman, a partner with global venture firm Bessemer Venture Partners, says “COVID-19, in fact, ignited venture capital. The truth is, it accelerated some parts of the industry and brought in even more outside capital.”

These remarks were made at a virtual VC round table discussion organized in December by Tel Aviv University’s *Coller Venture Review*. Shai Bernstein, an Associate Professor of Business Administration at Harvard Business School, hosted the round table with Fiona Darmon, a General Partner at Jerusalem Venture Partners (JVP), and Felda Hardyman of Bessemer Venture Partners.

Bernstein focused on three themes. First, he explored the impact of the coronavirus pandemic on venture capital, especially on the sourcing and geographic dispersion of investments. Second, he spoke about the emergence of mega-deals and the concentration of capital, including the fact that “80% of capital in the venture industry was allocated to rounds more than \$25 million.” Finally, he highlighted the



barriers to diversity and gender balance in the VC industry.

Bernstein began with an open-ended question: “How do you view the role of venture capital overall in society as an asset class?” he asked. In response, Hardyman noted that the pandemic has exacerbated a trend that has existed for the last four or five years and which has now taken off. “Growth equity is now increasingly treated as an intermediate, almost independent asset class,” he said. “It has attracted hedge funds, private equity funds, even limited partners investing along with venture capitalists.” The reason, Hardyman explained, is that “there is a perceived stability in startup companies that are well-sponsored and well-managed. Having been in the business for 42 years, [I know that] they are not all well-managed; in fact, often they are not. But in general, there is a kind of stability that is seen, and that has changed the way we do business.”

Thanks in part to the infusion of fresh capital, Hardyman noted that

“**COVID-19, in fact ignited venture capital. The truth is, it accelerated some parts of the industry and brought in even more outside capital**”

Bessemer Venture Partners had approved 15 deals in two weekly meetings at the end of 2020. “Several of those were follow-ons,” he said. “At least five were raising more than \$100 million at a valuation of more than \$1 billion. That used to be a public offering. Now it’s just another Monday.” The influx of outside capital had added to the stability, he added.

Entrepreneurs Without Borders

The COVID-19 crisis also accelerated another trend—the seeming disappearance of geographic borders for online business. “Entrepreneurship is borderless,” Hardyman said. “Silicon Valley doesn’t have a monopoly on innovation anymore. The COVID [pandemic] has accelerated online business and brought it forward [possibly] five to ten years.” For example, he pointed to the software business, which is migrating increasingly to the cloud. “We are the largest investor in cloud software in the world,” he added. “What does that mean? It means that Shopify, for example, can service the globe as far as startup companies go. It does not make any difference where you are. You can build a world-class company now on the cloud from any geography.” As a result of these factors, Hardyman said, “venture capital is probably more important as an asset class than ever before.”

Darmon agreed with Hardyman’s view. “Both here in Israel and our offices in NYC, everything down to the last bit resonated true,” she said.

In March, at the onset of COVID, she and her colleagues at JVP “went into the trenches to strengthen the portfolio. We thought that no matter where the next 18 months were going to take the portfolio, we need to get ready. Our mind-set was, ‘No matter the uncertainty, cash is king, and this is going to be a time for opportunity.’” Their top priority was to ensure that their portfolio companies had enough cash and credit to last at least 18 months. “We secured over \$200 million of cash and about \$70 million of credit facilities for the companies,” she said. “It was all about ensuring that they had the resources to make it through, and even take advantage, of the storm.”

As the months rolled by, Darmon and her colleagues realized that several companies, especially those engaged in enterprise, data, cyber and e-commerce, were thriving rather than struggling. “The move to home offices is only just one major example,” she said. More and more people self-isolated and practiced social distancing because of the pandemic, and this sparked a surge of what Darmon described as “solace buying... from the comfort of your own room.” She sits on the board of a company that went public last year, and it had to “digitize its packaging because everybody wanted more efficiently sized boxes for shipments. It became a crazy year. We have seen businesses go on steroids. We were getting ready to brace like [the recession of] 2008, and suddenly all these categories blew out of the park.”

Among the additional sectors that saw robust growth were digital health, telemedicine, and logistics, Darmon noted. Banking was another sector that was forced to go digital almost overnight. “The banking sector in Israel didn’t even know what online was until the pandemic kicked in,” she said. “Suddenly you did not have to go to your branch any more to sign the forms; all that moved online. Many mom-and-pop stores moved online. Sadly, what stayed behind were the small domestic businesses that couldn’t digitize their operations fast enough.” ➡

“Everything has changed. The most important thing is that the end game is different. We are looking bigger; we are seeing bigger”

Darmon, like Hardymon, witnessed the waves of new capital pouring into the industry. “We are seeing a tremendous amount of co-investment,” she said. “That was already the trend in 2019, but in 2020 it massively kicked up speed.”

Darmon reiterated the critical importance of venture capital as an asset class. “There are so many great deals out there now,” she noted. “Nobody is looking at the capital market as the exit scenario.” Though Darmon had taken a company public in Tel Aviv two weeks before this discussion, she did not view it as an exit. “It is a form of growth equity, and we continue to build up these players,” she said. “Everything has changed. The most important thing is that the end game is different. We are looking bigger; we are seeing bigger.” Darmon observes more patience among Israeli entrepreneurs because they are ready to go further. “In terms of the role of the asset class, it is the most interesting one. It is driving the economy. It is creating jobs. It is creating an alternative to the old world.”

Bernstein asked Hardymon which sectors of industry were changing most because of the pandemic. The response: “One in every ten dollars in venture capital this year is going into digital healthcare.” While that might seem predictable, Hardymon believes that these investments are not a bubble. “It’s going to stay,” he said. “Like so many other things, things are getting moved forward that will be that way forever.” Software as a service (SaaS) is also an area that is attracting capital. “Even now, it accounts for 40% of our dollars going out,” he added.

Boom in Semiconductors

Hardymon believes “we are on the verge of another big boom in semiconductors.” He has a ringside view of this sector as a board member of a semiconductor company; and Bessemer has four or five semiconductor companies in its portfolio. “We have seen Nvidia buying everything that AMD or Intel can’t buy, he said. “There has been big consolidation at the top.

And coming up underneath is a new set of semiconductor companies, which are going to be fundamentally different because we no longer depend on Moore’s Law.” Hardymon added that “materials are still really, really interesting,” and that “some of the semiconductor companies are now pushing materials. Quantum computing is fundamentally a materials thing. We have positions in all of those...they are now close enough that they are out of the science stage and into the development stage.”

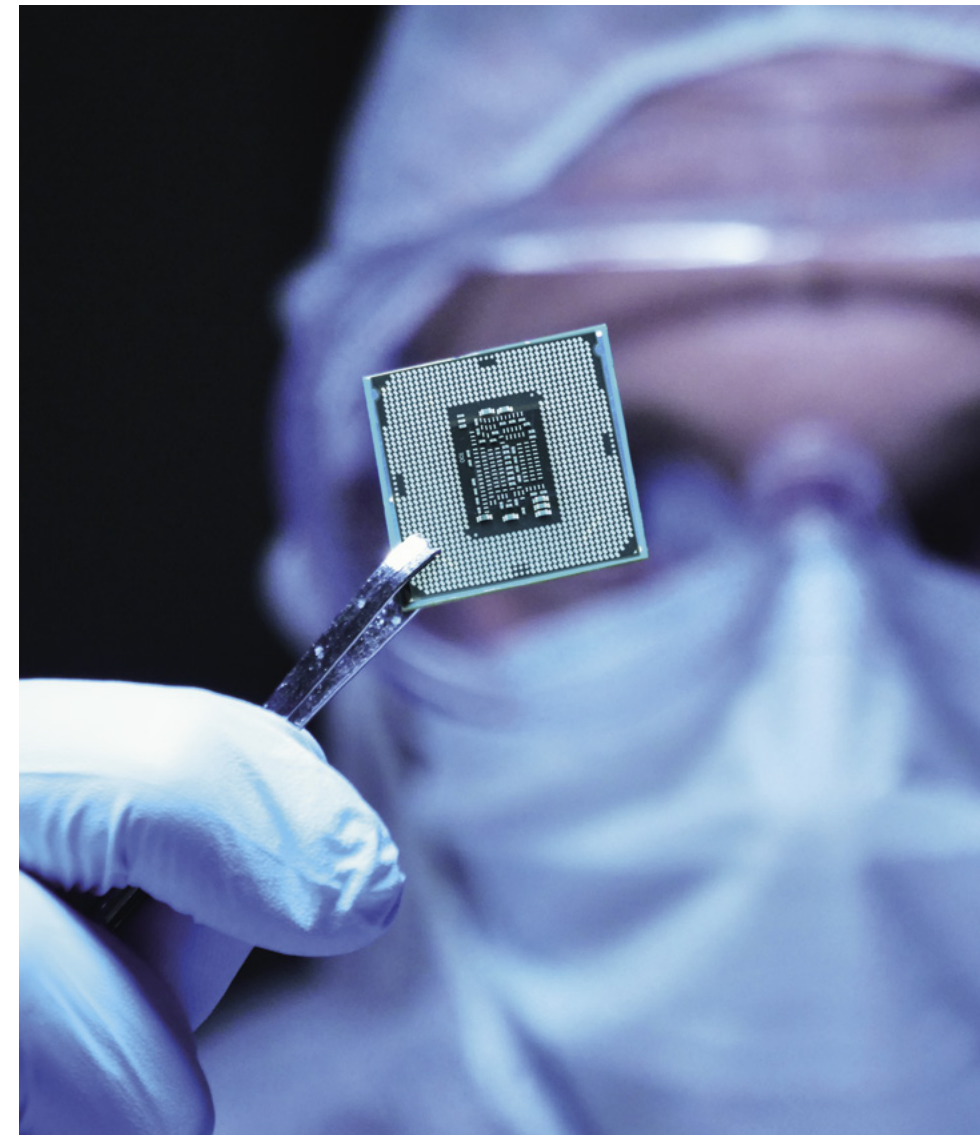
Bernstein wondered what Darmon and Hardymon thought about the trend of capital growth and increasingly larger rounds of VC investment. “That triggers concentration on the venture side as funds are becoming bigger to keep up with the pace. But can

this have made VCs even somewhat narrower in terms of the type of companies they are willing to fund?” he asked. “If you are an early-stage investor, you need to find companies that have the potential to absorb these large sums of capital down the road.”

Darmon noted that the question relates to a discussion going on within the venture capital sector about the changing role of seed capital. “Statistics show that in 2020 seed [investment] went down materially. This is primarily because a lot of capital has moved along the food chain. It is not necessarily because of concentration, but it is just that there is a tremendous amount of money available now, and that is probably one of the more interesting alternatives to the capital markets to a degree.” She added that as more capital has become available, VCs have been making some of it available to their portfolio companies to pursue strategic acquisitions. She did add though, that seed investments must continue, as these deals feed the food chain, and create the major companies of tomorrow, emphasizing the need to continue to allocate a certain number of investments to seed.

Bernstein asked how the presence of bigger funds—combined with the change in early-stage investing—has altered the investment strategy of venture capital firms. Hardymon replied that it has changed the whole VC industry. “I do think what Fiona (Darmon) said is one way that has happened. An even bigger force has been just the rush into the intermediate and growth stage capital from civilians and non-venture capitalists...The way the industry invests has changed.”

During the tech bubble of the late 1990s, the venture capital industry stage-shifted its strategy downwards. In contrast, the present transformation is different. “Two things have happened,” Hardymon noted. “One is that funds that can raise the money have done so and started to participate more in the middle and late rounds. You have the phenomenon of a lot of the big managers, us included, who have multiple funds that include later-stage funds. We have also made ➔



links down to the seed stage. We have several seed initiatives. We are not the only venture capital firm that has that.” Some firms have alliances with entrepreneurship accelerators such as Tech Stars. “We have changed the way we do our business to catch things coming out and to get started early, and then having the drive power to ride them out. As a firm—and as an industry—we look at things differently.”

Diversity and Gender Balance

As the discussion neared its end, Bernstein brought up the issue of diversity and gender balance in the venture capital field. According to Hardymon, this is an important issue, and “it is a problem in our industry.” While Bessemer has had several “wonderful women partners, they... are at a bunch of other places because they got recruited away from us,” he said. “But we have more in the pipeline.” Darmon asked, “That is a question that you need to explore: Why do they move on?” “Well, because they get attractive offers,” Hardymon replied. And Darmon said: “Okay... you just answered the question.”

Darmon said JVP has an interesting situation. “Without ever putting it as an agenda, a statistic, a plan, we



“
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What suddenly happens when
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except for merit**
”

are 50% women partners,” she said. “What suddenly happens when it’s so balanced, it suddenly becomes more natural when you’re recruiting to be looking at both women and men without realizing or consciously doing that.” Darmon noted that women with strong positions in a VC firm usually cannot be brought from outside; they must be grown from within. “We have never made diversity a conscious agenda at JVP. It is just the way it is. There are times when there are more women than men around the table. It is so balanced because no one feels that they are there for any reason except for merit.”

Bernstein concluded the round table by asking both participants what should be done to make the venture capital industry more inclusive. Darmon noted that it was important to grow inclusiveness from within. “Very often, it is about mentorship, about growing another generation, giving them room to grow, and recruiting in very diverse places.” Hardymon agreed with Darmon that VC firms need to grow diverse talent from within, “and we all have responsibility for that.” In addition, he said that Bessemer has “always seen women as being part of the founding group [of portfolio companies], but we are also seeing more and more companies led by women. We are recruiting more and more women as CEOs, and that is because of the consciousness of the last 10 years. We are hitting the knee of the curve, at least in some places.”

Darmon noted that venture capitalists—partners and managing partners—need to be rainmakers. “And for women to be strong partners, they must be rainmakers as well,” she said. “The more female-led companies we see, CEOs we see, founders we see, we will also see them crossing the lines and becoming partners and leading funds.” ■



About

Fiona Darmon, General Partner at Jerusalem Venture Partners is an integral part of the leadership team at JVP, overseeing the firms ongoing operations including defining the groups’ strategy as well as leading the raising of numerous funds that have allowed JVP to continue building world-class technology companies. Darmon has over fifteen years of experience in venture capital, strategic planning, capital raising and investments in public and private companies, having previously held a variety of executive roles with leading Israeli investment conglomerate, Koor Industries, as well as serving as a founding member of the first Israeli corporate VC—Koor CVC.

Darmon started her career as a financial analyst with Claridge Israel LLC, the investment arm of the Bronfman family of Canada. Darmon was an Officer in one of the renowned units of the Israeli IDF, and holds a BA in Finance and IT and an Executive MBA from the Kellogg School of Management’s international program in collaboration with Tel Aviv University.



Felda Hardymon, Partner at Bessemer Venture Partners since 1981 and Professor of Management Practice at Harvard Business School, focuses on investments in the software, semiconductors, communications, and storage sectors. At Bessemer, he led early investments in Parametric Technology, Staples, Cascade, Sirocco, Sahara, Celtel, and Endeca, all of which led to multi-billion dollar outcomes.

He taught and researched at Harvard Business School, where he held the appointment of MBA Class of 1975 Professor of Management Practice, and served twice as a visiting Professor of Finance at the London School of Economics.

In 2011, Professor Hardymon received the National Venture Capital Association’s Lifetime Achievement award.

Now retired from academia, he is a co-author of *Venture Capital, Private Equity, and the Financing of Entrepreneurship*, the standard textbook for venture capital.

Professor Hardymon holds a Ph.D. in Mathematics from Duke University.



Professor Shai Bernstein is Associate Professor in Entrepreneurial Management at Harvard Business School and a Faculty Research Fellow at the National Bureau of Economic Research (NBER). His research focuses on financial issues related to startups and high growth firms, and their interaction with innovation and entrepreneurial activity. Prior to joining Harvard Business School, he was a faculty member at the Stanford Graduate School of Business.

Some of Professor Bernstein’s latest research includes: *Does Venture Attract Human Capital and The Creation of Evolution of Entrepreneurial Public Markets*.

Professor Bernstein holds a Ph.D. in Business Economics from Harvard University.

A New VC Fund Rides the Silver Tsunami

Abby Levy
Managing Partner & Co-Founder,
PrimeTime Partners

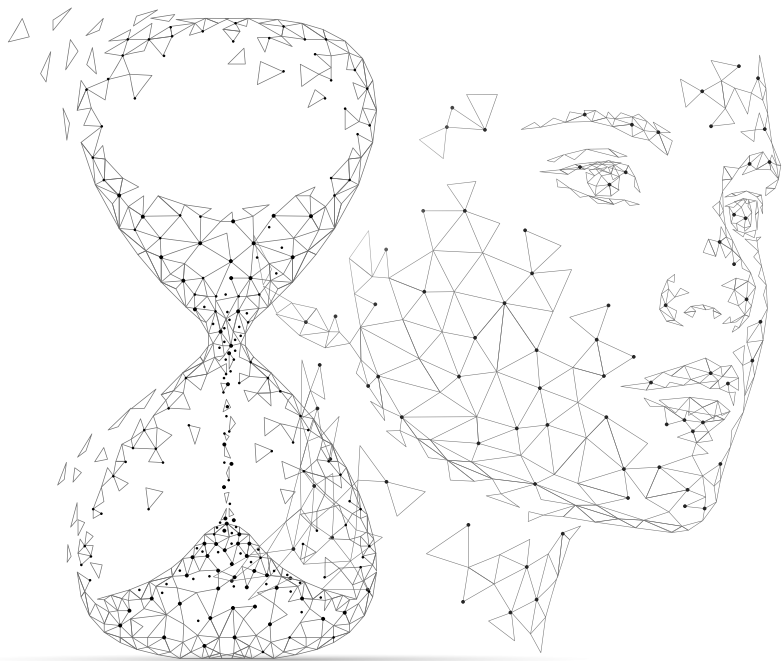
The aging of the world’s population is among the most significant transformations of this century. For Abby Miller Levy, managing partner and co-founder of New York City’s Primetime Partners, this offers an opportunity to build a network of startups that serve the needs of the elderly. Levy’s co-founder at Primetime Partners is Alan Patricof, aged 85, who serves as the fund’s chairman and is a pioneer in the world of venture capital.

The world’s population is getting older. This is a transformation that the United Nations describes as “one of the most significant...of the 21st century.” The cohort aged more than 65 is growing faster worldwide than any other group, and this trend will continue for decades. “By 2050, one in six people in the world will be over age 65 (16%) up from one in 11 in 2019 (9%),” according to data from *World Population Prospects 2019*. One expression, among several used to describe this phenomenon, is “the silver tsunami.”

For Primetime Partners, this tsunami appears to be less of a destructive force than an energizing opportunity. A \$32 million “early-stage venture capital fund that invests in companies...

that can transform the quality of living for older adults,” the fund was launched in New York City last year at the height of the COVID-19 pandemic. In the past six months, Primetime Partners has invested in nine portfolio firms that serve seniors or are startups that older entrepreneurs have launched. The founders are looking for more deals. “If you have an idea, reach out to us,” says Abby Miller Levy, Managing Partner and Co-Founder. “We are in the early days of building a lot of businesses in this space. No idea is too rough to get started.” ➡





How does Primetime Partners view the opportunities it offers? In this interview with the Collier Venture Review, Levy discusses these questions and more.

An edited version of the conversation appears below:

Collier Venture Review —

What inspired you to focus on startups that serve the needs of the elderly? Was there an event or incident that sparked your interest in this underserved market, which other VCs tend to overlook?

Levy —

For many people, the catalyst is that they experience either their parents’ or grandparents’ failing health and they get a window into the health system and how older adults are treated. That was not my experience. It was the opposite, and it had to do with the personal growth story for my parents. As I looked at my father, who retired early, and my mother as well, I wondered how they could spend their time and what meaningful experiences they could have. As I began thinking about this, I saw that other than healthcare and housing, there are not a lot of private sector alternatives for

older adults. The reason for that is because everything is changing. When life expectancy was 65 and you retired at 55, there did not need to be all these products, services, and experiences for a market that people thought was going away. Either because of mortality or because fixed incomes are declining incomes, catering to the elderly was not an attractive opportunity. But today, half the population born after 2007 is expected to live to be more than 100. As a result, we now have a 30- or 40-year life span that did not exist before.

We can call it “retirement” or “the golden years,” or whatever euphemism you want to use; I personally call it “the Third Act.” We have a meaningful chunk of time in which to provide older adults with great experiences. That was the impetus. I am an entrepreneur myself, and I started to write business plans of possible businesses that could fill this space. As I came up with more and more ideas, I realized that my role was not best served in creating a single business but in building an investment platform to seed multiple businesses.

The venture community has not overlooked this issue; there just has not been a robust supply of startups. It is a supply issue rather than one of demand. That has limited the venture community. The other reason is that the venture community has become highly sector focused. We have health-tech funds, fintech funds, consumer-tech funds and blockchain funds. At Primetime, the fact that we go horizontal across a consumer demographic allows us to cross-pollinate several concepts [across these sectors].

For example, consider direct-to-consumer marketing. This is an area from which many founders have shied away. They do not yet know how to apply the playbook for millennials—customer acquisition cost, life-time value and such concepts—to older adults. We have found that we can take one of our investments in a fintech business that is making great strides in Facebook paid marketing and share that with an e-commerce company in our portfolio and vice-versa.

The opportunity in being horizontally specialized is that we can build our own expertise in marketing and distribution. There does not need to be a brand-new technology that didn’t exist before to dramatically improve the quality of living for older adults. We need to take existing technologies and better apply them, engage older adults, and serve them in different ways. That is much more of a marketing and distribution challenge than a technology challenge.

Collier Venture Review —

If you look at the global market of products and services for the senior cohorts, how fast is it growing?

Based on what you described as your horizontal approach, how do you think about its various segments and components?

Levy —

There’s data to show how fast the population is growing, but because businesses aren’t classified by age group—nor do I think they should be—there isn’t really a sense of, in aggregate, how big the industry is. There are pockets of specialized industries, like senior living, like Medicare Advantage, like some of the government services that serve this population. There are pockets of data on how fast it is growing, but that is tempered by how fast the population is growing. The population is projected to be 25% of the global population, up from 15% just a couple of decades ago. In the U.S., this population controls more than 60% of the country’s net worth.

In terms of the segments, these are what you would imagine them to be. It aligns with what older adults care about, and plenty of studies have been done to show they care about three things: their health, their financial security, and having meaningful experiences. To be clear, health is a wide sector ranging from pharma and biotech, which we do not touch. We also do not invest in businesses with regulatory hurdles. We do look at health IT, aging in place, in-home care, home health aides, et cetera. There is a whole industry there.

In terms of fintech, this has usually been bifurcated into two segments. You have financial services: A key question is How do we advise the retirees? To date, that has been limited to the very wealthy because financial services just have not penetrated mass market older adults. Some 50 million Americans do not have a financial plan for retirement.

Then there are novel financial products. Other than the 401(k)—the 401(k) was a major innovation from the defined benefits and pension plans—long-term care insurance has been around for a long time. Both those markets need to be disrupted. That is because 50% of Americans are going to run out of money. The math does not add up. People are living longer but their financial outlook is not changing; in fact, it has gotten worse. We see a tremendous need for financial product innovation as well.

In terms of experiences, this is where any of the successful startups that have been targeting people in their 20s and 30s have a corollary. Take fitness, for example. ➡

“There’s data to show how fast the population is growing, but because businesses aren’t classified by age group there isn’t really a sense of, in aggregate, how big the industry is [...] plenty of studies have been done to show they care about three things: their health, their financial security, and having meaningful experiences”

It is a market I know well because I used to work at SoulCycle in the fitness area. The fitness needs of older adults are different from those of a 20-year-old. And yet, why aren't there more robust offerings? We are seeing that. In fact, we just made an investment in a business in that space.

Mental health is another important area. The way older adults or people of different generations view mental health is different from how the 20-year-old views it. Taking existing products and trying to remarket them isn't as compelling as creating new versions that are designed for older generations.

The travel segment looks at how and where you want to live. If you look at Airbnb, more than two-thirds of their hosts are aged 45-plus. There is a whole new way of how people are thinking about experiences.

I think we are going to continue to see a big change in the way older adults consume media, commerce, and other aspects of what is often called the experience economy, which I am sure you've read or written about. But if you think about it, it has not really translated to people in their 60s.



Coller Venture Review —

As you think about people who are aged more than 60, have you found that this group consumes products and services differently than millennials and younger consumers? Are they more frugal or are they more willing to spend because they have greater purchasing power?

Levy —

That's a great question. Just to overlay this—and there is some data to support this—as we age, we get more heterogeneous. If you think about it, it makes sense, right? You get more set in your ways, you are who you are, you are less pressured to conform. So, when people ask, “What are the purchasing habits of this audience?” I always pause and say, “There are so many segments that to have one point of view would really, I think, be ageist, if anything.”

One of the things that I am continuously reminded of is how heterogeneous this group is. That said, I think a couple of findings are relevant. First, in terms of purchasing power, this audience does a tremendous amount of research. Whereas when you start a digital business, targeting a younger audience, it's always, “How do you have as little information as possible, as little friction, to get them to do something?” With older adults, it's “How do we give them enough information, enough trust authority?” Let them go deep if they want to go deep. Let them pick up the phone and call someone if they want more information so that they can make a more informed decision. That is something we have learned from a lot of our portfolio companies. That desire for research, for information, and for real

authority is a difference in the go-to-market.

Second, when you talk about being frugal, it's not about frugality as much as just the reality and the psychology of when you're on a fixed or declining income. You have a different psychology of purchase than when you know you are getting your next paycheck. You may have people in your life who have experienced it. It has a tremendous impact on purchasing decisions.

There are ways to get this audience in those situations to become more comfortable with purchasing. That can range from installment plans and parsing things out to performance-based payments, or all of those pieces. Another way to deal with the psychological issues is to spread the burden. We are seeing—especially post-COVID—this surge of adult children who say, “I want to help Mom and Dad, and I don't know how to do that because how can I financially support them in different ways? It is not tax efficient for me to write them a check. They don't want a check from me.” We are going to see more of this kind of crowd funding.

Coller Venture Review —

As you continue to research this market, what has been your most unexpected finding? Has there been anything that was truly a surprise to you?

Levy —

I was surprised at how few founders are aged 60-plus. I think there are people who become consultants or work for themselves or in the gig economy, but there are tremendous barriers as an older adult to start a business, in terms of network, access to capital, and just the peer

group. I was surprised that there were not more older adults designing for themselves—the way that every other age cohort seems to design for itself. We have “mommy businesses” being designed by new moms, and college kids creating businesses for college kids, so why aren't there more 60- and 70-year-olds saying, “Hey, this is a pain point in my life. Let me solve this.”

Coller Venture Review —

Have you found any exceptions?

Levy —

Yes, absolutely. That is a secondary part of our mission, to elevate the role of older adults in the startup ecosystem. We have two portfolio companies that are founded by entrepreneurs aged 50-plus. In both cases, they took the learnings from their careers and are applying it to the older adult market. In general, it is something I'm very focused on for 2021.

Coller Venture Review —

Inequality and debt are growing rapidly among the elderly. What opportunities for innovation does this create? What can entrepreneurs do to enhance the financial well-being of older people?

Levy —

There are products that are around—savings products that kick in earlier on. I have been talking a lot about crowd funding. So, what is the 529 for older adults, for longevity? How do we flip it around? We save, and we have tax advantages to save for our college kids' education. How come we are not doing that for older adults?

The biggest cost that older adults are going to face is healthcare. What most older adults fail to appreciate is that unless you are on Medicaid and below the poverty ➡

“50% of Americans are going to run out of money. The math does not add up. People are living longer but their financial outlook is not changing; in fact, it has gotten worse. We see a tremendous need for financial product innovation”

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Being a female-run fund, identifying female entrepreneurs is (also) important to me. Female entrepreneurs are attracted to female GPs. There are a lot of elements of diversity in addition to age... gender, ethnic, religious... We are looking at all those factors

line, your home health costs aren’t covered, and there’s so much out-of-pocket expenditure. So how can we create new supplemental insurance products that prepare us for the burden that is to come?

One other aspect involves real estate – and we just invested in a business that relates to this. For most adults, their largest piece of their net worth is their home. One of the companies we have invested in, Fraction, has a new type of mortgage product—a fraction appreciation mortgage—because we must find more ways to unlock the value that these older adults have created.

The last area that I hope helps with the financial issue is employment. How do we find alternative income sources for older adults? When I think about some of the biggest opportunities, most of these questions we have raised have been the focus of the nonprofit and government sector. This is because to date, they have been focused on and, frankly, bearing the financial burden of our aging population. Now I am excited to see more private-sector founders saying, “How can I help the nonprofit and government sectors? How can we work together?”

Coller Venture Review —

When older people move from careers into retirement, in theory they have more time than younger generations. What opportunities for leisure products and services does this create for entrepreneurs? Have you found entrepreneurs who are willing to help create second and third careers for retirees?

Levy —

This is something that I feel passionate about. Alan Patricof and I started [Primetime Partners] when I was 45, and he was 85. People ask all the time, “What’s it like working with Alan?” And I say, “We talk every morning at 7:30, after he has done his 10-mile bike ride. We work a full day.” I think we need to recognize that every person has strengths and weaknesses, and it is irrespective of age. The sooner we do that, we can start to recognize, “Here’s what this individual has to contribute,” rather than judging them by characteristics such as age.

I think we have not even begun to start that process as a society. I hope through our work to continue to show role models who are ageless and contributing. We also hope we can hire folks on our team that

represent that perspective. We are at ground zero on this topic.

Coller Venture Review —

I am glad you brought up Alan Patricof. How did the collaboration with him come about? How do you work together?

Levy —

I have known Alan for a little more than four years. I was the founding president of a business called Thrive Global with Arianna Huffington. Alan Patricof was an investor in Thrive, so we met in that context. Just over a year ago, I was having brunch with one of his sons, who I went to business school with, and I told him that I was starting a venture fund focused on older adults. He put down his fork and



said, “That’s what my dad wants to do.” It was quite a timely, I would say, fateful moment. Alan and I had lunch the following week, and that was that.

Within a few months we formalized, we secured a partnership with Welltower Senior Living Real Estate Investment Trust, and we were about to launch in March when COVID hit. We delayed fundraising for just a couple of months but started investing, and

now we are up to nine portfolio companies in the past six months alone. It has been truly wonderful.

Alan’s ability to leverage his experience and his pattern recognition with founders is fantastic, as is his energy for always providing new ideas: “Have you thought of this; have you thought of that?” Alan also likes to go into the details. If we need to do due diligence on a company, he’ll make the customer calls. Alan likes to play the role from analyst to managing partner; he spans the range. I have thoroughly enjoyed working with him. We have a few other team members that have subsequently joined the team, and I would say—and he would say—he is having the most fun he has ever had in his career, and this is where he wants to have tremendous impact.

Coller Venture Review —

You mentioned the pandemic. What impact did that have on your plan beyond the timing factor that you mentioned? Did you have to revise your strategy in any way?

Levy —

That’s a great question. I say almost sheepishly that the pandemic sped up our ability to go to market and accelerated everything we were doing. When we went to investors saying we were raising this fund, it was while a light was being shone on the issues facing older adults in terms of what is happening in senior living and nursing homes. How do we take care? How do you age in place? All those issues were front and center in a way that I would just say everyone nodded their heads. Let us put it this way: There’s not a single person that we spoke to who did not get it. I think that was certainly helpful.

And then, some of our businesses were accelerated by COVID. We are invested in Tembo Health, which is a specialty telemedicine business focused on senior living facilities. We are invested in GetSetUp,

which is a Zoom enrichment platform for older adults. A bunch of things were accelerated because older adults were online. They were FaceTiming or Zooming online, and that also accelerated some of the businesses we were looking at. So, net/net, I would say COVID was an accelerant—it was a tragic accelerant, if you will—to our launch.

Coller Venture Review —

You mentioned nine portfolio companies so far. What did you look for before choosing to invest in these ventures?

Levy —

We look for what every other venture capital firm looks for—a compelling product with evangelical users and a great founding team. There is nothing different about our method of investing. As a first-time fund, almost creating a new sector, we plan to be the biggest and most significant. For us, the strategy was to make sure across our three areas of health-tech, fintech, and consumer-tech, that we were placing some bets on platforms that have the potential over the next decade to have tremendous impact.

Sometimes that would mean smaller check sizes than we would have liked. Sometimes it might have been at around a little later stage than we would have liked. But the key point was that we need to start to build this ecosystem of founders that we can work with across the portfolio. That was really what the strategy was, honestly, to get going.

Coller Venture Review —

How do you set yourself apart from other funds that are also focused on the senior market?

Levy —

We do that in three ways. One is my background as a marketer and as an entrepreneur myself. I think this is mainly about distribution and marketing. I am very hands-on with the founders and the teams ➡

on product messaging, marketing, and growth partnerships.

The second piece is building this next gen group of founders with whom we can work across the portfolio with synergies, such as referrals and sharing learnings.

The third piece is thought leadership. We did some press when we launched. You will see a lot of other PR-worthy activities from Primetime in 2021. We want to be a beacon in the space, and so I view our job as two-thirds investing and one-third leadership. I think that is a little different. The founders we speak with recognize that we are going to be bold in trying to build this category. There have been other funds there that are wonderful partners to us but have been much more focused just on the investing activities.

Coller Venture Review —

As you think about your investment philosophy, would you say you are more motivated by social impact or financial potential or both?

Levy —

We are a for-profit fund. We work on behalf of our investors, and financial impact is our priority. However, if our portfolio companies do not have social impact, they are not doing their jobs right. You will not see us investing in businesses that just serve an exceedingly small, affluent portion of our society. Almost all our businesses serve the mass market of older adults. That is both because that’s where the financial opportunity is, and secondly, it’s where I think our values are most aligned with our founders. There is no reason you can’t do both, but we lead with what is a good financial opportunity.

Coller Venture Review —

How much of your fund will be invested in ventures launched by older entrepreneurs, and how much will be services for the elderly?

Levy —

All our businesses need to serve older adults. Within that, what

portion will be started by older adult founders? As many as we can find is the answer. Right now, we have two out of nine. We do not have any quotas or thresholds, but that’s what we’ve identified as being great investments. It is something we track—the diversity of all of our founders. Being a female-run fund, identifying female entrepreneurs is important to me. Female entrepreneurs are attracted to female GPs. There are a lot of elements of diversity in addition to age... gender, ethnic, religious, you can go on and on. We are looking at all those factors.

Coller Venture Review —

As you were speaking with investors about participating in your fund, how difficult was it to convince them not to fall prey to ageism and be biased in favor of younger entrepreneurs and founders? Why does this bias against ageism persist? What can be done to combat it?

Levy —

To answer your first question, our investor group believes wholeheartedly in our mission. If you look at the demographic trends, it is a no-brainer. All the VCs I have spoken to have had a bullet point on their list for a few years called “the silver tsunami,” or “longevity,” or “the silver market.” We did not come up with this brand-new idea. We are just executing against it, and our investors completely believe in it.

In terms of ageism, that is one of the -isms that is not really talked about yet. There are several reasons for that. It just has not had visibility in the same way. It is interesting, because we just went through a presidential election where both the candidates were aged more than 75. There has not been really a tremendous visibility to this issue. Why? There are all sorts of reasons, everything from our own fear of our mortality to the concerns around the entitlement economy. My perspective on how to get started

with these issues is to demonstrate through role models and action and results that this is a market worth designing for. I love that we are talking with government agencies. My point of view is, “Let’s prove it through showing success.”

Coller Venture Review —

As you explore these opportunities, what do you think are the biggest risks in targeting the senior market? What are you doing to mitigate those risks?

Levy —

It is so specific to each business. We are still at the point when people talk about aspirational marketing. People still think about the silver-haired man and woman walking down the beach, swinging their arms together. This notion of the realism of aging is a risk because it is not as beautiful as it has been depicted. There is a marketing challenge around aspirational versus real. I do not usually think about it in terms of risks. Part of the reason is that there is so little built, and it is such a big space. For startups, just pick a piece of the puzzle that you want to solve. Solve it well, and you will have a big business. The only risks I would see are people stumbling in terms of how to connect with this audience, but not anything structural, not anything competitive. It is a blank canvas for startups.

Coller Venture Review —

Where do you expect Primetime Partners to be in the next three to five years? How will you define your success?

Levy —

Our success comes when we have from our first fund a cohort of companies that are big businesses, household names that are viewed as founders who transformed this sector. That is one element of success. The second is that any founder in the space who wants to start a business that serves older adults comes through our doors because they want to work with us,

and they know we can help them grow. The third element is more personal. It is to build a firm that stands by the values of our founders. Starting a firm is an entrepreneurial task in and of itself. We are a startup. When I look at our success, it is not just the success of our portfolio and our brand but also of our team. That means working with great people and helping them fulfill their goals, whether you are a 25-year-old associate or an 85-year-old managing partner, that we are all having enriching and rewarding careers. Those would be three elements of success for the fund.

My message to anyone who is reading this is, if you have an idea, reach out to us. We are in the early days of building a lot of businesses in this space. No idea is too rough to get started. ■



About

Abby Levy, Managing Partner & Co-Founder at PrimeTime Partners has spent her career helping businesses and consumer brands grow as an operator, entrepreneur and advisor, most notably in the wellness sector. Prior to Primetime Partners, Abby Levy was an executive at SoulCycle, where she oversaw business development and revenue growth outside the consumer studio business, with an emphasis on building new digital products as the Senior Vice President of Strategy & Growth.

Abby Levy has also been a founder, teaming with Arianna Huffington to launch Thrive Global, a behavior change technology company focused on employee productivity and wellness. Abby Levy served as President of Thrive Global and remains on the Thrive Board.

Abby Levy began her career at McKinsey & Company then led product development at OXO International. She is a graduate of Princeton University and Harvard Business School.

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Our *Trends in Venture* section addresses change and challenges in new venture creation. This issue considers opportunities for new entrants, both among individual entrepreneurs and within emerging sectors.

Ethan Mollick addresses the so-called “unicorn’s myth,” and the apparently false assumptions uncovered in his research that seem to persist among entrepreneurs. Most significantly, Mollick makes a strong case for a more inclusive path and towards the democratization of entrepreneurship. From an industry perspective, he is joined in this section by Xavier Vives of IESE, who addresses the opportunity for new venture, specifically in the form of FinTech innovation.

Together, these contributors combine theory and practice to help us consider new opportunities at an individual and sector level. Looking forward, future discussions in the *Trends in Venture* section will continue to compare and contrast thematic change, including innovations and their practical implications at a macro and micro level.



Shifting the Entrepreneurial Paradigm to a Data-Driven View

Professor Ethan Mollick
*Associate Professor of Management,
Wharton School of the
University of Pennsylvania
Author of *The Unicorn's Shadow:
Combating the Dangerous Myths that
Hold Back Startups, Founders, and Investors**

In this interview with the Collier Venture Review, Wharton Associate Professor Ethan Mollick emphasizes the importance of methodical testing and measured adaptation among startups in a post-COVID-19 world. Mollick discusses the most enduring myths about entrepreneurship and how recent research shows that these are false. He also speaks about how founders get ideas for new ventures, how to make better pitches for capital, and what the world can learn from Israeli startups. Most importantly, he offers advice on which skills founders should build in order to help their ventures scale up and succeed.

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Myths about who should become an entrepreneur are dangerous because they discourage people who otherwise might start companies from doing so
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Collier Venture Review —

What inspired you to write a book about myths of entrepreneurship? Did your experience as an entrepreneur shape your thinking before you entered academia?

Mollick —

It did—but my ideas were shaped more by teaching thousands of students about entrepreneurship. It is such a powerful concept. People want to become founders. They read a book about Steve Jobs or Mark Zuckerberg or Peter Thiel, and they try to emulate these models. Looking at such examples is fine, but the issue is that in the last 10 years, there has been a boom in entrepreneurial research that uses real data to get at deep questions about how you start a company and what you should do as a founder. Data often contradicts some of the received wisdom. That is what encouraged me to write this book. Many people become discouraged from entrepreneurship because they follow the wrong advice.

Collier Venture Review —

What do you consider to be the wrong advice? What are the most dangerous myths and monomyths about entrepreneurship? Where do they come from and why do they persist? ➔

20%–50%

The boost to your chance of success by writing a business plan even though they are out of style

Mollick —

I separate them into myths about whether you should become an entrepreneur, and those about how to be successful as an entrepreneur. Myths about who should become an entrepreneur are more dangerous because they discourage people who otherwise might start companies from doing so. That is a problem because we already know a lot of biases exist. Founders of venture-backed, high-growth companies are disproportionately male, white, and highly educated. It would be nice to see more people from other backgrounds launch companies.

The myth that you must launch a company as a young techie does not match up with the data, which

shows that older founders are more successful. Another myth is that you must have a certain personality type to be a good founder; we have lots of evidence that that is not true—there is no entrepreneurial personality type. Such myths are dangerous because they discourage people from even trying.

Another big myth is that once a company is launched, you should just start doing stuff, just go out and start selling. But there is a process that entrepreneurs should go through when they want to run a company, a process of disciplined experimentation. It is not about just starting to do things. You need a disciplined approach.

“This does not mean that every company should be founded by solo entrepreneurs, but there is little support for the view that you should always found companies in teams”

Collier Venture Review —

One of the issues you address in your book is the need for co-founders, which venture capitalists seem to almost insist on. What does the evidence show?

Mollick —

I have a research paper with Jason Greenberg at New York University “Sole Survivors: Solo Ventures Versus Founding Teams” where we show that solo founders often outperform groups of founders. This does not mean that every company should be founded by solo entrepreneurs, but there is little support for the view that you should always found companies in teams. A lot of evidence suggests that founding a company as a team can create all kinds of tensions. If you have someone with whom you are launching a company, it is often difficult to resolve those tensions. A study from about 20 years ago surveyed venture capitalists. It showed that when a company fell apart, 65% of the reasons had to do with conflicts within the senior management team. That is a common way for companies to fall apart. People are too willing to emphasize having co-founders. In fact, you can hire people to work

with you or give them equity stakes without them being co-founders.

Collier Venture Review —

What kind of shadow do unicorns cast over the entrepreneurial ecosystem, especially in places like Silicon Valley? What myths do unicorns breed, and what are the implications?

Mollick —

Unicorns—or private companies worth more than \$1 billion—are the lottery ticket winners. Those are the touring rock bands or the Hollywood actors, to use analogies from other fields. That is why people go into acting, or why they start playing the guitar, or why they become entrepreneurs... they believe they are going to be unicorns. Part of the issue with unicorns is that becoming one requires a lot of luck and good timing. When you look back at unicorns that were successful and you try and emulate them, not only are you at risk of emulating bad behavior—what we call superstitious learning—but you are also not necessarily emulating the core of what made that unicorn successful.

For example, think about Facebook. It was not the first social network. What lessons can you learn from

its meteoric rise? Certainly, some of it might have been because of the clever strategy of launching in colleges first and creating demand. But it also was at the right time at the right place. People were connected to the internet and found it interesting. What can you replicate from that? If you just take lessons from these unicorns, you might end up emulating things that may or may not have been responsible for their success.

Collier Venture Review —

You write about the importance of using data to bust myths. Could you offer more examples of how new scholarship is overturning conventional wisdom?

Mollick —

Sure, the book is full of data like that. For example, you get about a 20% to 50% boost to your chance of success by writing a business plan even though they are out of style. That is not because business plans are useful as your plan, but they help you as a team surface issues and coordinate on the future. That is a useful process. I talk about data on the age of founders and the psychology of founders, and where all that comes from. One of my favorite examples is the data showing overwhelmingly, that if you want to be more creative, both sleep and coffee help. That is useful information. Everything in the book is data informed.

Collier Venture Review —

Coming up with ideas for a startup is often the first challenge for an entrepreneur. Where do founders come up with startup ideas?

Mollick —

In the book I discuss a few different ways, because there is not one magical method. Often a good way to start is by scratching your own itch to think about an effectual approach to entrepreneurship. What do you know, who do you know, what resources do you have at hand, and what can you build from that? You are probably an expert in something, whether it ➡



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The first thing you need to do is know how to tell a good story. [...] A lot of founders overemphasize showmanship over preparation
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is a hobby or a particular task at your job. So where are the gaps?

Another way I like to give people a hint is when you're at a job and you see Microsoft Excel being used for anything other than adding up numbers, it's almost always an opportunity for a piece of software. This is because Excel is the programming language available to the masses, so it's a great place to start to find a business idea.

Coller Venture Review —
Capital is the fuel that drives startups. What does the evidence show about how entrepreneurs should raise capital to keep their ventures growing?

Mollick —
There are two flavors of capital—dilutive and non-dilutive. Non-dilutive capital tends to be the founder's own money, or resources raised through crowd funding or grants. Those are all nice forms of capital because you do not have to give up any equity of your company.

Then you have massive dilutive funding, which includes things like venture capital or angel investment. There is a lot in the book about how you can sell and pitch to these groups of people. But the general goal is, only raise as much as you need and only when you need it, which is easier said than done. But it's not a trophy; it's a means to an end. Your venture is an engine—and capital is fuel for your engine. Your job as an entrepreneur is to build the engine and then get the right fuel for it at the right time.

Coller Venture Review —
Has the ability of founders to raise capital dried up because of the pandemic? If so, how are entrepreneurs dealing with that situation?

Mollick —
The latest numbers just came out a little while ago. People were predicting that there would be a big drop in the amount of capital being invested and worrying about

the changes to geography. For most venture capital funding, the average distance for companies in which VCs invest is only 80 miles, and 40% of VC investments are within two miles of their headquarters—so investment has been highly centralized. People thought, maybe there will be a drop in capital investment, but maybe then we will be using Zoom to make investments and we may not need to go to Silicon Valley anymore. Both those things have turned out not to be true. So far, the change in capital investment has been small, and the capital is still going to the same old places it always went to.

Coller Venture Review —
Interesting. The more things change...

Mollick —
Exactly.

Coller Venture Review —
Pitching to angels, VCs and other potential investors is among the most important skills for any entrepreneur. What are some of the most common mistakes that you have seen founders make in this regard? How should they correct them?

Mollick —
The first thing you need to do is know how to tell a good story. That often means sticking to a standardized method by which you tell these stories, a set of slides you use. I would recommend sticking to that method, but also making sure you can tell that story in a compelling way. A lot of founders overemphasize showmanship over preparation. The evidence shows that for professional investors, showmanship, like passion, does little, while preparedness and organization and clarity does a lot. For amateur investors, showmanship can often work better, but for professionals—that is the kind of investment that founders are looking for—you want to show methodical testing. The things that make you successful as an entrepreneur

should make you successful at raising capital. You want to show the experiments that you have been conducting are successful, and what they have taught you, and how you can continue to learn and grow in the future.

Coller Venture Review —
Many new ventures flounder because, though they start strong, they fail to scale. What are some of the biggest challenges that startups face in building their operations over time and across regions? How should they deal with them?

Mollick —
The most important thing is organizing yourself early. Companies tend to continue along their initial path. Founders who do a good job setting up their organizational structure and caring about it from the beginning generally do better. A paper that just came out shows that you cannot make up later for missed organizational opportunities at the beginning. Figuring out how you want to grow your company, how it will look, what the org chart will be early on is helpful. In addition, hiring methodically, using proven techniques like behavioral questions, can be extremely helpful. On the customer side you need to make sure of the product-market fit. Make sure you understand why your customers are buying your product before you start spending a lot of money on marketing.

Coller Venture Review —
As founders think about the human side of scaling, you said that many ventures fall apart because of conflicts in the management team. As a company scales, how should it integrate the right kind of management expertise so that this does not happen?

Mollick —
It is important for founders to be aware of their own skill sets and to bring in people who have complementary skills early on and have a clear span of control for ➡



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The things that make you successful as an entrepreneur should make you successful at raising capital. You want to show the experiments that you have been conducting are successful, and what they have taught you, and how you can continue to learn and grow in the future
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those people. Knowing what they are responsible for helps prevent conflict and helps you scale up well. Founders also need to constantly let go of things as they grow, because they cannot have their fingers in everything the way they did when the company first started. Having a structure where you are training and handing things off to people from the beginning is extremely helpful.

Coller Venture Review —

What are some of the most important lessons you have learned about evidence-based entrepreneurship based on your research and that of other colleagues?

Mollick —

The most interesting paper I recall is one that showed that most stories that people tell about why their startups failed end up not actually telling you the root cause of why they failed. They are to help the emotional process of grieving for a company from the founder. It's hard to learn stuff from just observing. If you want to learn things, there is a strong mismatch between the popular view and what the data suggests. I think that people do not want to necessarily know, and I do not think the data is the only answer.

You want to be unique, you want to tell your own story, but I think you should be aware of what the data says so that you can make the right choices about when to ignore it.

Coller Venture Review —

What is the Saturn Parable, and how does it tie into the themes of leadership and teamwork that you discuss in the book?

Mollick —

In addition to this book, I wrote another one a while ago on video games in business, a subject that I have been interested in for the last 15 years. It is about how you use games and simulations to teach effectively. I have been teaching using an entrepreneurship simulation in my classes for the last four or five years. Students run a realistic fake startup company over the course of several weeks, and they must manage all the processes from legal issues to customer issues. I bring in a mix of actors and real people to play roles. I have professional dungeon masters who play various characters.

I have been working with a new group at Wharton that I founded along with my colleague Sarah Toms called Wharton Interactive. The goal of that group is to take games we have been running in

the classroom and use them to help transform education. One of our first products is called Saturn Parable, which takes place on a fake mission to Saturn in 2087. A lot of the stuff about it is realistic because we want the science to be real. But the idea is that, if you put people in a fake setting, they often learn better than if it is a realistic setting—especially about leadership or teamwork. We have you play this simulation, and crazy things happen that stress you in all sorts of interesting ways, and they force you to make errors with your team that are the kind of errors that happen in real life but in an accelerated way. It's a really cool discussion. Think of it as an escape room meets leadership training experience meets a classroom.

Coller Venture Review —

Israel is often called a startup nation because it has more startups per capita than any other country. What lessons can entrepreneurs in other parts of the world learn from Israeli startups?

Mollick —

Israel is either third or fourth in the expanded European, Middle East area in terms of fundraising. One of the most powerful lessons of Israel is the importance of ecosystems. They are not easy to start—you cannot just start an ecosystem. You need successful founders, sources of capital and government investment. Then it becomes self-sustaining in a useful way.

Starting with community, with a group of people and creating a virtuous cycle, is an important lesson from Israel. The other thing that Israeli startups teach us is about improvisation and bricolage. In a place where there were not necessarily a lot of resources or capital to get started, there was lots

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We know that startups that improvise tend to survive. In contrast, startups that have too many resources fail at a higher rate than startups with less resources. You don't want to have no resources, but you don't want to have too many. In the middle, there's improvisation—and figuring out what to do with what you have
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of need to improvise. We know that startups that improvise tend to survive. In contrast, startups that have too many resources fail at a higher rate than startups with less resources. You don't want to have no resources, but you don't want to have too many. In the middle, there's improvisation—and figuring out what to do with what you have. That kind of outward focus of having a small market that you need to quickly overcome is one of the reasons why Israeli companies have been so hungry and successful.

Coller Venture Review —

One of the most important messages from your book is that entrepreneurship is not in-born, but a skill that can be taught and learned. What advice would you give founders about the most important skills they should learn to succeed, even if their firms are not unicorns?

Mollick —

We know that the two things you can learn that will make you more successful as a founder—based on actual controlled experiments—are pitching and experimenting. You can learn how to do pitching better, and it has an effect. You can also learn how to run experiments better.

A study in Italy found that companies that learned how to run experiments in a scientific way for their startup had twice as high revenue a year later as those that did not take a scientific approach. Those are two clear skills that founders could focus on to be more successful. What I urge all founders to do is realize that you must design your startup so that you can always keep learning. You have to learn about yourself as a founder. ■



About

Professor Ethan Mollick is an Associate Professor of Management and Ralph J. Roberts Distinguished Faculty Scholar at the Wharton School of the University of Pennsylvania, where he teaches innovation and entrepreneurship. He is an award-winning author of numerous publications, recently *The Unicorn's Shadow: Combating the Dangerous Myths that Hold Back Startups, Founders, and Investors*. His work on crowdfunding is the most cited article in management published in the last five years.

As the Academic Director and Co-Founder of Wharton Interactive, Professor Mollick works to transform entrepreneurship education using games and simulations. He has long held interest in utilizing games in education, and he co-authored a book on the intersection between video games and business that was named one of the American Library Association's top 10 business books of the year. He has built numerous educational games, which are used by tens of thousands of students around the world.

Professor Mollick holds a Ph.D. and MBA from MIT's Sloan School of Management and a B.A. from Harvard University, *magna cum laude*.



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The potential short-term implications for new entrepreneurial startups in the financial system has never been larger
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FinTech and the Future of Banking

Professor Xavier Vives

*Professor of Economics and Finance,
IESE Business School*

The current rapid pace of change in the banking sector appears to be accelerating, with digitalization increasing competition, including in the adoption of different forms of digital currencies. Combined with low interest rates and the resulting pressure on bank profitability, the potential short-term implications for entrepreneurial startups in the financial system has never been larger.

Among related developments, we see the massive application of digital technologies and the emergence of new competitors. These have allowed for many new products and services and helped improve the efficiency of incumbent banks. At the same time, they have also favoured the entry of new firms, increasing competition with traditional bank business models. Startups face uncertain interaction effects, the result and impact of which depend on the market structure that eventually prevails.

Historically, banks have controlled digital forms of money and payments through regulatory protection of deposits, exclusive access to the central bank settlement system, and partnerships with credit card companies. However, the challenge today comes from a variety of digital assets that do not sit on the balance sheet of banks such as electronic wallets, stablecoins, and balances with a telecom provider. Control of these digital assets are among the competitive advantages of new entrants. Specifically, payment technology—including connections to the growing digital life of consumers and business alike—has been among the new entrants’ keys to success.

Technology-based disruption has of course occurred outside of just the payment paradigm. For example, the entry of new players offering credit has provided another foothold, affecting banks through downward pressures on fees and prices and more compressed margins. This is particularly true when a country’s general development ➔

is higher and its banking system is less competitive, but less so when the country's regulation is stricter. Across the board and by contrast, non-bank entry has not yet been meaningful in demand deposit-taking activities, possibly due to concerns about regulatory burdens. Change has been uneven, but steadfast in its growth.

A main conclusion of the recently released report *The bank business model in the post COVID-19 World*¹ is that pre-COVID-19 tendencies will be accelerated, as subdued economic growth and low interest rates persist and digitalization in its many forms continues to advance. The response to increased digitalization will require more investments in IT and will tax the overextended branch network of many banks, particularly in Europe. The result is that the sector will need a deep restructuring.

The swift shift towards a more digital world in response to COVID-19 makes clear that the speed of change may take everyone by surprise. Interestingly, large technology companies have many of the ingredients to get ahead in the post-COVID-19 world. They are digital natives, have the technology, customer base and brand recognition, as well as vast amounts of data and deep pockets.

A possible outcome is that a few dominant platforms will control the access to a fragmented customer base, each of which inhabits different ecosystems. In this case, financial service providers will compete to supply the platforms, and customers will demand services from their

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Both banks and customers have realized that they can work and operate remotely in a safe and efficient way. The response to increased digitalization will require more investments in IT and will leave obsolete the overextended branch network of many banks, particularly in Europe
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platform provider. In such a future, the degree of rivalry in the market will depend on the cost of switching from one ecosystem to another. The larger the costs, the less competitive the market will be. In this world, dominant platforms could include current digital giants plus some platform-transformed incumbents.

Regulators have adapted to the digitalization disruption by balancing their fostering of competition to allow the benefits of innovation while still protecting financial stability. They must ensure a level playing field and coordinate prudential regulation and competition policy with data policies. This will require navigating complex trade-offs between the stability and integrity of the system, efficiency and competitiveness, and privacy. ■

¹ E. Carletti, S. Claessens, A. Fatás, X. Vives, *The Bank Business Model in the Post-COVID-19 World*, Centre for Economic Policy Research, 2020, <https://media.iese.edu/research/pdfs/ST-0549-E.pdf>

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In this world, dominant platforms could include current digital giants plus some platform-transformed incumbents
”



About

Professor Xavier Vives is Professor of Economics and Finance, Abertis Chair of Regulation, Competition and Public Policy, and Academic Director of the Public-Private Research Center at IESE Business School. His award-winning research focuses on industrial organization and regulation, economics of information, dynamic rivalry, innovation and competition, banking crisis and regulation, and information and financial markets. Most recently he co-authored *The Bank Business Model in the Post-COVID-19 World*.

Previously, Professor Vives served as a member of the Advisory Board for Economic Recovery of the Government of Catalonia and Special Advisor to the Vice President of the European Commission and Commissioner for Competition. He served as President of the Spanish Economic Association, Duisenberg Fellow of the European Central Bank, and President of EARIE.

Professor Vives has been an advisor and consultant on competition, regulation, and corporate governance issues for numerous global organizations including the World Bank, the Inter-American Development Bank, the European Commission, and the Federal Reserve Bank of New York.

Professor Vives holds a Ph.D. in Economics from UC Berkeley.



Industry Analysis

A Shot in the Arm for Digital Health Innovation

72

Leading Transformative Change in Digital Health – Lessons from Practice

Dr. Lilach Weisz

*Head of Innovation and Tech Transfer,
Tel-Aviv Sourasky Medical Center*

Tamar Many

*Co-founder, MindState
Senior Design Lecturer,
Shenkar College of Engineering,
Design and Art*

Overview

Our *Industry Analysis* section draws on one of the most essential tools for analyzing a commercial ecosystem. The tool, conceptualized and then refined over decades, facilitates an understanding not just of what is, but of future transformation within an industry and, often, across industries.

In this issue, we appropriately enough address digital health, and the opportunity to improve healthcare accessibility and efficiency by bridging the practical chasm between technologists, entrepreneurs, and healthcare institutions. We are joined by Lilach Weisz, Head of Innovation and Tech Transfer at the Tel-Aviv Sourasky Medical Center, and Tamar Many, Co-founder of MindState, an ideation lab focused on digital health and a Senior Design Lecturer at Shenkar College of Engineering, Design and Art. The authors underline the ways in which scaling new starts in digital health require collaboration across fields to instantiate theory into practice.

Looking forward, the *Industry Analysis* section in future issues will similarly be written by industry leaders addressing technology-driven innovation.

Leading Transformative Change in Digital Health – Lessons from Practice

Dr. Lilach Weisz

*Head of Innovation and Tech Transfer,
Tel-Aviv Sourasky Medical Center*

Tamar Many

*Co-founder, MindState
Senior Design Lecturer,
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“As leaders of healthcare innovation, our close work with seed stage digital health startups has illuminated insights regarding digital health innovation. From our experience, startups that have partnered with healthcare organizations, as early as the research stage, have been able to innovate, adapt, and execute nimbly. In this article we discuss the basic tenants of such partnerships, including points which can help broaden accessibility and deepen efficiency.”

The field of “digital health” is defined as the combination of healthcare and technological developments that deliver the next generation of digitized healthcare solutions. While the field may be only a decade old, it is rising in significance. This is partly due to the impact of the recent COVID-19 pandemic. More fundamentally, the rise of digital health reflects the need to improve healthcare efficiency and accessibility. Put simply, the field will likely play a significant role in bringing about the next era of healthcare delivery.

While venture investment has grown to embrace digital health, the field still appears to lack consistent and clearly defined paths to support new venture success. A key underlying question is how to improve the path to innovation where there is the potential for transformative change. When we probe further, we find that the gap between healthcare centers and the technologies meant to support them remains quite significant—and that it is within this gap that many digital healthcare startups seeking to innovate lie.

A few case studies drawn from our work can underscore the importance of crossing the chasm between practice among digital health startups, and their brethren working on site in hospitals and related healthcare settings.

GistMD: GistMD’s mission is to create a smart platform that provides patients with personalized information about their medical journey, including explanatory videos about diagnoses and procedures. The platform engages patients in their medical processes, ➔



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The field still appears to lack consistent and clearly defined paths to support new venture success. A key underlying question is how to improve the path to innovation where there is the potential for transformative change

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leading to reduced patient anxiety, greater patient satisfaction and time saving for medical staff. To date, GistMD has raised \$2.2 million. They have also successfully deployed their platform at a world-leading research hospital and are in the advanced stages of deployment at other leading hospitals, who will become the firm’s first paying customers. The transformation from initial bedside observation to a funded digital health startup, would have been unlikely absent their early, hospital-centric trials.

Enroute: Enroute addresses intra-hospital transportation systems characterized by long waits for patients and staff. The venture’s intelligent algorithms dispatch transporters on-demand to deliver patients and medical equipment, and transparently provide this data to medical staff. Their hospital pilot is expected to demonstrate a significant delta in accessibility and efficiency, ahead of funding and geographic expansion. Absent the opportunity to trial and transform the venture’s underlying algorithms based on observation in practice, this innovation would likely have stalled.

While the above two startups may not be exactly what one thinks of when considering *medical* innovation, both capture and reflect the challenges that healthcare organizations face. They are precisely the type of innovations that are ripe to be incorporated into healthcare organizations—and, indeed, both these startups partnered with hospitals at early stages, with positive results that may not have been predicted.

It may also seem risky for healthcare organizations to partner with seed startups such as GistMD and Enroute. But as many top organizations are constantly searching for what can keep them on the cutting edge

of healthcare, tapping into the “innovation ecosystem” is one way to do so. Hence the timelines and specific contours of digital health-healthcare partnerships are worth exploring bilaterally. Below we therefore suggest elements of best practice which we believe can help build a solid foundation for potential partnerships, propelling startups and healthcare organizations alike towards innovation.

1. Finding the Optimal Partner

Once a seed stage digital health startup decides to partner with a healthcare organization, it is crucial to find those capable of facilitating its growth. This specifically means the organization should be willing and able to provide in-kind resources (e.g. time, manpower) or actual funding (e.g. via VC arms for later stage funding). An in-house startup collaboration unit dedicated to supporting practice-based partnerships can provide additional significant benefit. Startups will have to interface with multiple stakeholders across the organization, and an internal team can facilitate this. It is also helpful for the healthcare organization to overlap with the general aims and expertise of the startup.

2. Building a Long-Term Strategic Partnership

A key goal of a partnership between technology startups and healthcare centers should be to build the foundation for long-term collaboration. Designing and implementing a formalized agreement can help healthcare centers function almost like a startup incubator, giving the startup room to learn, grow and explore. If successful, the organization even has the potential to become the startup’s first paying customer.



3. Not Just Doctors

Partnering with healthcare organizations, on the one hand, is a matter of finding physicians who deeply understand the startup’s ecosystem and unmet needs they are tackling. But this partnership is by no means *just* about physicians—it’s also about understanding the complex group of relevant healthcare stakeholders and finding ways to optimally interact with each. Depending on the project, the network can include psychologists, social workers, cleaning/cooking staff, as well as IT and financial departments, regulatory bodies and more. A key message here is that startups will have to interface with multiple teams across varying divisions, including diverse stakeholders and numerous internal systems.

4. Champion

The notion of a “champion”—particularly one from within the healthcare organization—is crucial to digital health startups. These champions will lead from within the healthcare organization, becoming actual startup partners who work diligently throughout the startup journey.

Practically, this means helping build roots within the organization by creating an in-house team which spans across the organization – clinical, administrative, and technological. The expertise of this champion can range depending on the startup’s needs, whether a medical practitioner, operational manager or IT lead. They should also be an opinion leader within their field, envisioning where the startup exists within the ecosystem, and an early adopter, not resistant to industry change.

5. Digital Health Data

Digital health startups depend on rich data throughout their journey. For this reason alone, there is no better place to find healthcare data than within the healthcare organization. Healthcare data runs the gamut, from patient health to demographic information to operations. For digital health startups, filtering through this data to excavate insights is key. Partnering early also means being able to use data to help validate basic assumptions surrounding unmet needs. Finally, new data may be collected along the startup’s journey—both quantitative and qualitative—which is a value-add for the organization.

“Seed startups need to move quickly to develop a rough idea of how to solve unmet needs. But too often they spend months working in isolation on a prototype which doesn’t meet real world needs”

6. Process-Oriented, Human-Centric, Multidisciplinary Teams

Seed startups need to move quickly to develop a rough idea of how to solve unmet needs. But too often they spend months working in isolation on a prototype which doesn’t meet real world needs. For this reason, digital health startups should not focus on solving specific outcomes, rather on the *process* of partnering early and learning from healthcare stakeholders, and then developing quick prototypes towards iterative solutions¹.

To ensure that startups don’t over-engineer solutions that real humans don’t need or want, much care should be put into making this process human-centric. Human-centricity is of extreme value within healthcare settings, which are typically centered around outcomes (i.e., curing specific illnesses). In complement, digital health startups should aim towards improving the patient and provider experience, keeping them front-and-center during solution building.

To optimize this human-centric process, a wide range of professions can be invoked. While this should include strategic design professionals able to facilitate human-centric methodologies, it can also include various other professions, ranging from UX designers to sociologists and beyond, to examine interactions between patients, families, and medical staff.

“While partnerships are not quick and easy nor a guarantee of success, they tend to challenge the rigidity of the silos which separate technologists from their eventual contexts, thus improving outcome measured by the impact and scalability of any given innovation”

The Path Forward

In the coming decade, digital health innovation will continue to grow. Funding may be readily available, but more than capital will be required for success. Partnering with healthcare organizations, and building on our model for change as outlined above, can help instantiate innovation, benefitting startups, their partner organizations, and even populations at large.

The initial innovative spark can come from organizations external to the startup or healthcare organization. And while partnerships are not quick and easy nor a guarantee of success, they tend to challenge the rigidity of the silos which separate technologists from their eventual contexts, thus improving outcome measured by the impact and scalability of any given innovation. As we build the next generation of healthcare, we hope that startups and healthcare organizations alike will recognize the mutual benefit in one another, and partner sooner rather than later. ■

¹ <https://medicalfuturist.com/5-things-we-learned-about-investments-in-digital-health-new-e-book/>



About

Dr. Lilach Weisz is Head of Innovation and Tech Transfer at the Tel-Aviv Sourasky Medical Center. Dr. Weisz holds a Ph.D. in Cancer Genetics from the Weizmann Institute of Science, an MBA in BioTechnology from Colman Business School, and an MS.c. in Biochemistry from Tel Aviv University.

Tamar Many is Co-founder of MindState, an ideation lab focused on digital health, and a senior design lecturer at Shenkar College of Engineering, Design and Art, and a lecturer at the Coller School of Management at Tel Aviv University.

Elie Bleier is a Research Assistant. Bleier expects to complete his M.A. in Philosophy from Tel Aviv University and holds a B.A. in Economics-Philosophy from Columbia University.

Coller Venture Digest

For the first time, we separately introduce our *Venture Digest*, referring our readers to some of the year’s best reads in venture, as suggested by our Advisory Board.

These articles cross the gamut from Entrepreneurial Team Formation to Funding New Ventures, Leadership in Venture, Social Entrepreneurship, Success in Venture Creation, and Change in Private Equity.

Our digest will continue to be updated, and we are pleased to provide hard copies upon request.

Entrepreneurial Team Formation

Age and High-Growth Entrepreneurship

Azoulay, Pierre; Benjamin F. Jones; J. Daniel Kim; Javier Miranda
American Economic Review: Insights, April 2019

<https://www.kellogg.northwestern.edu/faculty/jones-ben/htm/Age%20and%20High%20Growth%20Entrepreneurship.pdf>

This paper studies startups systematically in the U.S. and finds that successful entrepreneurs are middle-aged, not young. In the U.S., the mean age at founding for the 1-in-1,000 fastest growing new ventures is 45. These findings are consistent with theories in which key entrepreneurial resources (such as human capital, financial capital, and social capital) accumulate with age. Mechanisms by which young people are proposed to have advantages (such as energy or originality) may still be operating, but if so they appear to be overwhelmed by other forces. The findings are similar when considering high-technology sectors, entrepreneurial hubs, and successful firm exits. Prior experience in the specific industry predicts much greater rates of entrepreneurial success. This is a strong encouragement that it is never too late to become an entrepreneur!

Recommended by Prof. Francesca Cornelli, Kellogg School of Management

Immigration and Entrepreneurship in the United States

Azoulay, Pierre; Benjamin F. Jones; J. Daniel Kim; Javier Miranda
Working Paper 27778
National Bureau of Economic Research, September 2020

https://www.kellogg.northwestern.edu/faculty/jones-ben/htm/Immigration_and_Entrepreneurship_in_the_United_States.pdf

This is an important paper in the present environment: it uses U.S. administrative data, a representative sample, and Fortune 500 data to study the role of immigrants in entrepreneurship. Across all three data sets, the authors find that immigrants present a “right shift” in new venture formation, where immigrants tend to start more firms of each size per member of their population. It looks at how often immigrants start companies, how many jobs these firms create, and how firms founded by native-born individuals compare. The findings suggest that immigrants appear to play a relatively strong role in expanding labor demand relative to labor supply, compared to the native-born population, that immigrants act more as “job creators” than “job takers,” and that they play outsized roles in U.S. high-growth entrepreneurship.

Recommended by Prof. Francesca Cornelli, Kellogg School of Management

Entrepreneurial Team Formation

Lazar, Moran; Ella Miron-Spektor; Rajshree Agarwal; Miriam Erez; Brent Goldfarb; Gilad Chen
Academy of Management Annals, January 2020

https://www.researchgate.net/publication/334119413_Entrepreneurial_Team_Formation

Entrepreneurial team formation—the process through which founders establish a team to start a new venture—has important implications for team performance and entrepreneurial success. This article reviews entrepreneurial teams and how they play a key role in investment decisions and overall venture success. Investors often bet on the “jockey” (i.e., the team) rather than on the “horse” (i.e., the idea). But how do these teams come about in the first place? This article reviews recent work on entrepreneurial team formation and offers a useful framework for entrepreneurs searching for co-founders based on an integrative model that considers the evolving entrepreneurial context and the opportunity for teams to integrate research from different disciplines (e.g., economics, psychology, and sociology).

Recommended by Prof. Ella Miron-Spektor, INSEAD

Funding New Ventures

Sizing Up Entrepreneurial Potential: Gender Differences in Communication and Investor Perceptions of Long-Term Growth and Scalability

Huang, Laura; Priyanka Joshi; Cheryl Wakslak; Andy Wu
Academy of Management Journal, April 2020

<https://journals.aom.org/doi/10.5465/amj.2018.1417>

In this forthcoming Academy of Management Journal article, Professor Laura Huang (HBS) and colleagues uncover the subtle mechanism leading to gender inequality in startup funding. Specifically, they take a deep dive into founder-investors interactions and find that male founders use more abstract communication which is perceived as growth-oriented and thus more likely to secure funding. Women communicate more concretely than men which the audience described as psychologically close. Differences in linguistic abstraction are the result of several interrelated processes—including but not limited to social network size and homogeneity, communication motives involving seeking proximity or distance, perceptions of audience homogeneity and distance, as well as experience of power. Using a multi-method study of thousands of pitch decks and a clever experimental design, the authors show this is a widespread phenomenon and further document the negative impact on funding among female-led startups.

Recommended by Prof. Gary Dushnitsky,
London Business School

We Ask Men to Win and Women Not to Lose: Closing the Gender Gap in Startup Funding

Kanze, Dana; Laura Huang; Mark A. Conley; E. Tory Higgins
Academy of Management Journal Vol. 61, No. 2, April 2018

<https://journals.aom.org/doi/10.5465/amj.2016.1215>

This article reviews why male entrepreneurs tend to raise higher levels of funding relative to their female counterparts. This research suggests that the gap originates with a gender bias in the questions that investors pose to entrepreneurs. Investors tend to ask male entrepreneurs promotion-focused questions and female entrepreneurs prevention-focused questions. The paper offers evidence regarding tactics that can be employed to diminish the gender disadvantage in funding outcomes. Specifically, the authors find that entrepreneurs can significantly increase funding for their startups when responding to prevention-focused questions with promotion-focused answers, which has theoretical as well as practical implications for entrepreneurship.

Recommended by Prof. Ella Miron-Spektor,
INSEAD

Leadership in Venture

Both/And Leadership

Smith, Wendy K.; Marianne W. Lewis; Michael L. Tushman
HBR Magazine, May 2016

<https://hbr.org/2016/05/both-and-leadership>

In this article, Smith, Lewis, and Tushman describe contemporary paradoxes of leadership and effective ways to cope with them. They propose a new model—one in which the goal of leadership is to maintain a *dynamic equilibrium* in the organization. This is at the center of paradoxical leadership. By contrast, trying to shift the hearts and minds of senior team members is challenging and time-consuming. Moreover, their roles and responsibilities often lead senior people to deeply identify with one goal or another, fostering conflict. To unleash the power of paradox, therefore, leaders must build supporting organizational competencies into their senior team. Executives with this goal do not focus on being consistent; instead they purposefully and confidently embrace the paradoxes they confront. By adopting this paradoxical mindset, leaders can balance competing demands and promote innovation and sustainability. This requires managers to both separate and connect opposing forces.

Recommended by Prof. Ella Miron-Spektor,
INSEAD

Social Entrepreneurship

A Calculation of the Social Returns to Innovation

Jones, Benjamin F; Lawrence H. Summers
Working Paper 27863
National Bureau of Economic Research, September 2020

<https://www.kellogg.northwestern.edu/faculty/jones-ben/htm/Social%20Returns%20-%20Jones%20Summers%20-%20NBER.pdf>

The authors in this paper estimate the social returns to investments in innovation, and suggest that the social returns are very large. Even under very conservative assumptions, it is difficult to find an average return below \$4 per \$1 spent. Accounting for health benefits, inflation bias, or international spillovers can bring the social returns to over \$20 per \$1 spent, with internal rates of return approaching 100%. The implication is that innovation investments can credibly raise economic growth rates and extend lives, paying for their costs many times over. And because the social returns exceed the private returns, public policy has a central role, and opportunity, in unleashing these gains.

Recommended by Prof. Francesca Cornelli,
Kellogg School of Management

Success in Venture Creation

Predicting Success in the Worldwide Startup Network

Bonaventura, Moreno, Ciotti, V., Panzarasa, P. et al
Sci Rep 10, 345, January 2020

<https://doi.org/10.1038/s41598-019-57209-w>

In this article, Dr. Moreno Bonaventura and colleagues use big data methodology to predict startup success. They use a highly visible signal—the professionals (i.e., founders, employees, advisors, investors, and board members) that startups have in common—to calculate centrality measures for more than 40,000 startups across 117 countries. Sociological and economic research has previously investigated the impact of knowledge spillovers, involvement in inter-firm alliances, and network position on firms’ performance, innovation capacity, propensity to collaborate, and growth rates. Yet, whether the centrality in the professional network of newly established knowledge-intensive firms can help predict their long-term economic success has largely remained a moot question. This paper is among the first attempts to pave the way in this direction, and represents a contribution, from a different angle. This work is intended to elucidate the role that network mechanisms might play in sustaining success, with the authors finding that a startup’s centrality score is a significant predictor of the likelihood of a successful liquidity event.

Recommended by Prof. Gary Dushnitsky,
London Business School

Private Portfolio Attribution Analysis

Brown, Gregory W.; Frank Ethridge; Tyler Johnson; Thomas Keck
June 2020

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3624399

In this paper the authors use the comprehensive Burgiss data to approximate fund performance attributions at the portfolio level, and propose a method for providing attribution analysis to a portfolio of closed-end drawn-down funds such as private equity buyout funds and venture capital funds. The method isolates performance attributes related to fund strategy, fund geography, commitment timing, and commitment sizing. A residual unexplained component can be viewed as a fund selection attribute. While these confidence intervals are specific to the time periods used in the analysis, they provide a reasonable gauge for understanding what thresholds could be considered a significant skill for each attribute over a fairly long history.

Recommended by Prof. Eli Talmor,
London Business School

The Deregulation of the Private Equity Markets and the Decline in IPOs

Ewens, Michael; Joan Farre-Mensa
The Review of Financial Studies, hhaa053, May 2020

<https://doi.org/10.1093/rfs/hhaa053>
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3624399

This article suggests that the notion of going public as a major step toward expanding and hiring may not be as big a deal as anticipated. The deregulation of the private equity markets—and in particular the National Securities Markets Improvement Act (NSMIA) of 1996—has made it possible for both VC-backed startups and the funds investing in them to raise large sums of private capital. Together with the growing role of non-traditional investors such as PE or mutual funds in the entrepreneurial finance market, this has helped bring about a new equilibrium where fewer startups go public, and those that go public are older. The authors show that the bargaining power of startup founders vis-à-vis investors has increased and that founders are using their increased control over exit decisions to stay private longer. How this new equilibrium is affecting the incentives and returns of startup investors remains an open question.

Recommended by Prof. Joshua Lerner,
Harvard Business School

Systematic Change in Private Equity

Mutual Funds as Venture Capitalists? Evidence from Unicorns

Chernenko, Sergey; Joshua Lerner; Yao Zeng
The Review of Financial Studies, hhaa100, September 2020

<https://doi.org/10.1093/rfs/hhaa100>

In this paper, the authors present evidence to suggest that open-end mutual funds investing in private companies are increasingly more likely to invest in unicorns. For example, the aggregate holdings of open-end mutual funds in unicorns has increased from \$1 billion to more than \$8 billion from 2010-2016. In addition, rounds with mutual fund participation have stronger redemption and IPO-related rights and less board representation, all of which improve the liquidity of the underlying securities. This affects the governance of entrepreneurial firms and the evolving dynamics of investment in private firms.

Recommended by Prof. Joshua Lerner,
Harvard Business School

Value Creation in Private Equity

Biesinger, Markus; Cagatay Bircan; Alexander Ljungqvist
EBRD Working Paper No. 242 Swedish House of Finance Research Paper No. 20-17, September 2020

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3607996

In this paper the authors use a proprietary EBRD database to measure value creation at the level of the individual portfolio company (i.e., deal level). This is significant because while value creation and performance measurement of private assets has always been a central yet contentious topic, it is not straightforward to define the right benchmark within the broader asset class. Statistical methodologies such as those discussed here which decompose fund performance to its components (attribution analysis) go deep splitting the performance to many components based on the P&L, cash flows and market multiple firms. The authors conclude that successful execution appears to be a key driver of investor returns, especially in growth, buyout, and secondary deals. Much like combination therapies in the treatment of certain diseases, investor returns depend on how strategies are combined. Company operations and profitability improve in ways consistent with the successful implementation of value creation plans, and these improvements persist beyond PE funds’ exit.

Recommended by Prof. Eli Talmor,
London Business School

Advisory Board

Prof. Gad Allon



Jeffrey A. Keswin Professor and Professor of Operations, Information and Decisions, The University of Pennsylvania

Professor Gad Allon is the Jeffrey A. Keswin Professor and Professor of Operations, Information and Decisions, and the Director of the Management and Technology Program at the University of Pennsylvania. Professor Allon’s research interests include operations management in general, and service operations and operations strategy in particular. He has been studying models of information sharing among firms and customers both in service and retail settings, as well as competition models in the service industry. His articles have appeared in Management Science, Manufacturing and Service Operations Management and Operations Research. Professor Allon won the 2011 “Wickham Skinner

Early-Career Research Award” of the Production and Operations Management Society. He is the Operations Management Department Editor of Management Science and serves on the editorial board of several journals. Professor Allon is the Co-founder of ForClass, a platform that enables professors to drive higher student engagement and accountability in their classrooms. He regularly consults firms both on service strategy and operations strategy. Professor Allon holds a Ph.D. in Management Science from Columbia Business School in New York and holds a B.A. and M.A. from the Technion—Israel Institute of Technology. ■

Prof. Shai Bernstein



Associate Professor in Entrepreneurial Management, Harvard Business School

Professor Shai Bernstein is an Associate Professor in Entrepreneurial Management at Harvard Business School and a Faculty Research Fellow at the National Bureau of Economic Research (NBER). His research focuses on financial issues related to startups and high growth firms, and their interaction with innovation and entrepreneurial activity. Prior to joining Harvard Business School, he was a faculty member at Stanford Graduate School of Business.

Some of his latest research includes: *Does Venture Attract Human Capital* and *The Creation of Evolution of Entrepreneurial Public Markets*. Professor Bernstein holds a Ph.D. in Business Economics from Harvard University. ■

Prof. Francesca Cornelli



Dean, Kellogg School of Management, Northwestern University

Professor Francesca Cornelli is the Dean of Northwestern University’s Kellogg School of Management. She is also a Professor of Finance and holds the Donald P. Jacobs Chair of Finance. Previously, she was Professor of finance and Deputy Dean at the London Business School. She directed and advanced the Private Equity Institute of London Business School, building a bridge between academia and practice by partnering with private equity leaders in London, alumni and top academics in the field. Professor Cornelli’s research interests include corporate governance, private equity, privatization, bankruptcy, IPOs and innovation policy. She has been an editor of the Review of Financial Studies, and previously served on

the board of editors of the Review of Economic Studies and as an associate editor at the Journal of Finance. She is a research fellow at the Center for Economic and Policy Research, and previously served as a director of the American Finance Association. In January 2016 Professor Cornelli helped create and became a board member of AFFECT, a committee of the American Finance Association designed to promote the advancement of women academics in the field of finance. Professor Cornelli holds an M.A. and Ph.D. in Economics from Harvard University and a B.A in Economics, *summa cum laude*, from Università Commerciale Bocconi. ■

Prof. Gary Dushnitsky



Associate Professor of Strategy & Entrepreneurship, London Business School

Professor Gary Dushnitsky is an Associate Professor of Strategy & Entrepreneurship at the London Business School. He serves as a Senior Fellow at The Mack Institute for Innovation Management at the Wharton School, University of Pennsylvania. Professor Dushnitsky’s work focuses on the economics of entrepreneurship and innovation, and he advises corporations in the Financial Industry, FMCG, Clean Tech, and Pharma sectors. He explores the shifting landscape of entrepreneurial finance, exploring such topics as corporate venture capital, crowdfunding, and accelerators. His research appeared in leading academic journals, including *Organization Science*, *Strategic Management Journal*, *Strategic*

Entrepreneurship Journal, and *Nature Biotechnology*. Professor Dushnitsky serves as the Co-Editor of the *Strategic Entrepreneurship Journal*. He received academic distinctions including the 2013 SMS Emerging Scholar Award and the 2009 Kauffmann Junior Faculty Fellowship, has been featured in Business Week, CNBC, Dow Jones News, Entrepreneur Magazine, Financial Times, and has participated at the YPO, World Economic Forum, OECD, EVCA, and BVCA. Professor Dushnitsky holds a Ph.D. in Strategy from New York University and a B.A. and M.Sc. from Tel Aviv University. ■

Prof. Joshua Lerner



Jacob H. Schiff Professor., Entrepreneurial Management, Harvard Business School

Professor Joshua Lerner is the Jacob H. Schiff Professor in Entrepreneurial Management at Harvard Business School. His research focuses on venture capital and private equity organizations, particularly policies on innovation and how they impact firm strategies. He has authored several books and publications including *The Architecture of Innovation*, *The Comingled Code*, *Innovation and Its Discontents*, *Boulevard of Broken Dreams*, *The Money of Invention*, *Patent Capital*, and *The Venture Capital Cycle*. Professor Lerner co-directs the National Bureau of Economic Research's Productivity, Innovation, and Entrepreneurship Program and serves as co-editor of their publication,

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Professor Ella Miron-Spektor is an Associate Professor of Organizational Behavior at INSEAD. Her research focuses on personal and organizational factors that promote creativity, learning, and entrepreneurial success. She studies team characteristics that contribute to innovation and learning, the formation of entrepreneurial teams, strategies that enable leaders to cope with competing demands at work, and the influence of cultural diversity on creativity. Professor Miron-Spektor's award-winning research studying factors that contribute to team innovation and learning has been published in top management journals, including the *Academy of Management Journal*, *Organization Science*, *Organizational*

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David Sarnoff Professor of Management, MIT Sloan School of Management

Professor Scott Stern is the David Sarnoff Professor of Management at the MIT Sloan School of Management and a Professor of Technological Innovation, Entrepreneurship, and Strategic Management. He was previously a Professor at the Kellogg School of Management and Non-Resident Senior Fellow at the Brookings Institution. Professor Stern's research explores how innovation and entrepreneurship differ from traditional economic activities, and the consequences of these differences for strategy and policy. His research in the economics of innovation and entrepreneurship focuses on entrepreneurial strategy, innovation-driven entrepreneurial ecosystems, and innovation policy and management.

In 2005 he was awarded the Kauffman Prize Medal for Distinguished Research in Entrepreneurship. Professor Stern works with practitioners in bridging the gap between academic research and the practice of innovation and entrepreneurship through advising startups and other growth firms in the area of entrepreneurial strategy, as well as working with governments and other stakeholders on policy issues related to competitiveness and regional performance. He is the director and co-founder of the Innovation Policy Working Group at the National Bureau of Economic Research. Professor Stern holds a Ph.D. in Economics from Stanford University and a B.A. in Economics from New York University. ■

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Emeritus Professor of Accounting and Founder of its Private Equity Institute, London Business School

Professor Eli Talmor is an Emeritus Professor of Accounting at the London Business School and Founder of its Institute of Private Equity. He has served on the board of Governors of London Business School, Tel Aviv University and the advisory board of the African Venture Capital Association. He was previously on the finance faculty at the University of California (UCLA and Irvine), Tel Aviv University and the Wharton School of the University of Pennsylvania.

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In theory, theory and practice are the same. In practice, they are not.

Albert Einstein

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