IVEY BUSINESS REVIEW

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THE IVEY HBA STUDENT BUSINESS STRATEGY MAGAZINE

Editorial Board

Ivey Business Review is an undergraduate business strategy publication conceived, designed, and managed exclusively by students at the Ivey Business School. Its mission is to provide a forum for tomorrow's business leaders to develop, voice, and discuss their thoughts on today's business strategies, threats, and opportunities. Articles are written by undergraduate students in the Ivey HBA program, and have been created specifically for the publication after several months of intense collaboration between student writers and members of the Editorial Board. Additionally, the publication's blog platform allows students and young alumni to further the *IBR* mission year-round.

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Note from the Editorial Board:

"A Decade of Success"

Ten years ago, the Ivey Business Review was established. A small group of undergraduate students conceptualized and created a platform upon which Ivey HBA students could share their ideas on business strategy and push the boundaries of student thought. The publication's goal was simple: to stimulate conversation and foster the development of world-class business insights.

Twenty issues later, we continue to execute on that critical mission. In this latest edition, we bring you thirteen articles that propose actionable, considered strategic recommendations for businesses and industries the world over. Since our inception, the dominant companies, business models, and strategies have changed, but the business acumen and critical thinking underlying our articles remain the same.

The four pieces featured on our cover discuss companies that stand to benefit from, or must adapt to, secular trends. GameStop has experienced faltering performance as consumer preferences have changed; our authors reimagine an experiential strategy to revitalize the company. Another piece describes how, faced with persistently lower oil prices, ExxonMobil should refocus on vertical integration through investment in downstream assets. Intel, for its part, stands to benefit from the emergence of fog computing, while Wealthsimple can participate in growth stemming from increased demand for productive assets in India.

As we celebrate a successful ten years in operation, we are excited to share in this milestone with you, our readers. We thank you for your continued readership and support and we hope that you will join us in relishing the accomplishments of the past while remaining forward-thinking in future endeavours.

Sincerely,

Sharon Xu & Mark Krammer

Editor-in-Chief & Publisher

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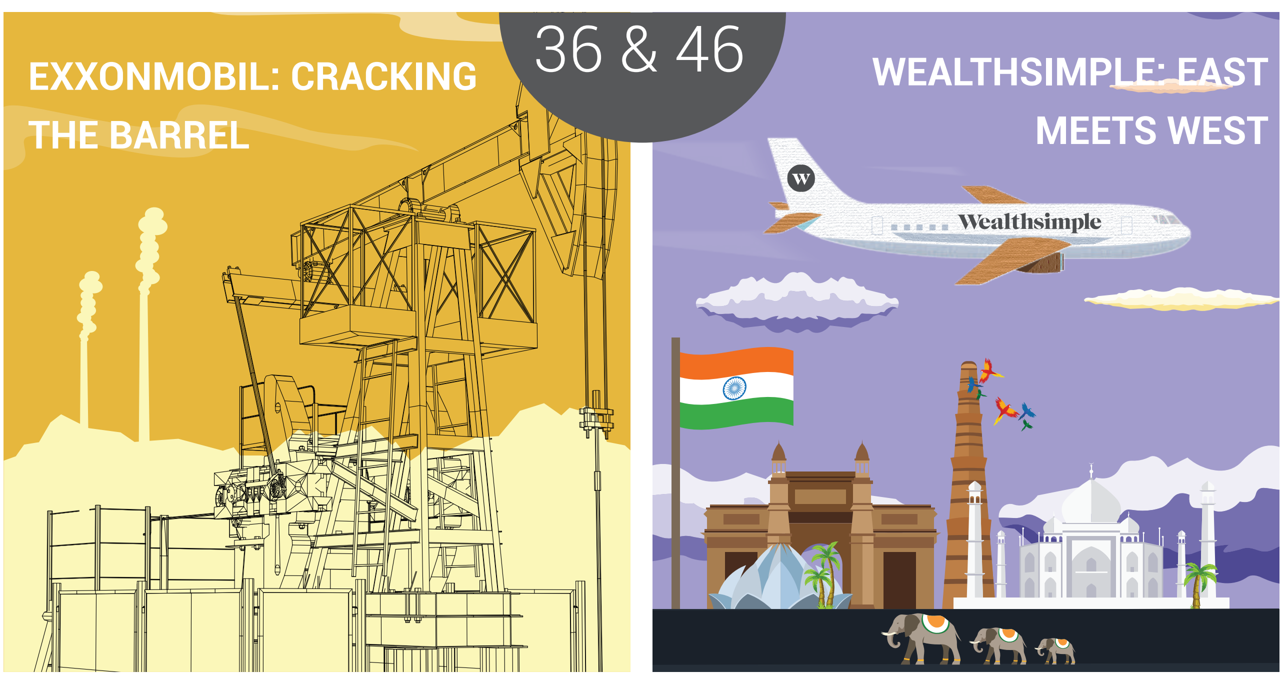
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Interview: Michael Rossi
President of adidas Canada

Illustration by: Sharon Xu

IBR: Throughout your career, you've held a variety of roles in different business functions. How has this breadth of experience helped you get where you are today?

MR: I've been fortunate to work in product management, in marketing, in sales, and in general management prior to coming into this role. All of that experience just makes you more well-rounded, more able to put yourself in someone else's shoes, and ultimately more capable of finding solutions and ways of working together that make everyone successful.

When I started out in marketing, understanding the process of how campaigns and marketing initiatives are developed and driven helped me engage with salespeople. When I moved into a sales role, I gained a different perspective dealing with customers. When you understand what the marketing people are trying to achieve, you have empathy for the other side of that partnership. I think it's benefited me and I would certainly recommend that folks do try and get diverse experience; it makes them more marketable and more effective in what it is that they're doing.

IBR: You briefly worked in marketing at Nestlé Canada but have been with adidas and Reebok for over 15 years. How has your experience in this unrelated industry proved useful as you progressed through your career?

MR: I remember a headhunter telling me, "Go and get some packaged goods experience because even if you want to come back to sports, it will always serve you well." That was absolutely correct. Being in the food industry—one that was more disciplined and structured at that time around consumer insights, research, and data—gave me a different perspective.

This ties into the previous question: I think the more diversity of thought and experience you can bring to future roles, the better. Being able to bring learning and insights from the packaged goods industry, even from in-store displays and packaging, was beneficial. When I came back into it, the sporting goods industry wasn't quite as structured and disciplined as it is now. Consumer data is everyone's buzzword today, but 15 years ago, coming from a packaged goods company that already focused on that data, insight, and research was really helpful.

I haven't left the sports industry in quite some time, but I do spend a lot of time speaking with people from many different industries. I think there's always learnings and insights that another industry might have discovered first but that you can apply to your own business.

IBR: What has been the greatest challenge that you've faced in your career?

MR: Two of the biggest ongoing challenges would be leading people and leading through change. I say that because I think they both require a lot of energy and resilience—they're not easy.

Coming out of Ivey, I felt confident making decisions on the business side, but there really is nothing that fully prepares you for leading people and leading through change. It is so unique to the circumstances, the situation, and the individuals involved. When you lead people, you really do need to understand their individual drivers and motivations. You need to tailor your leadership approach to the individuals on your team—I continue to learn that throughout my career.

On the leading through change piece as well, when you're the leader who is responsible, it can be daunting to lead through change where you may not even know how it's going to turn out. You have a vision and you try and paint that picture for others, but it does take a lot of energy and perseverance to push forward in times of uncertainty. Having said that, I would also say leading people and leading through change are two of the most rewarding and satisfying experiences I've had and continue to have, so although they demand a lot of you, they also give a lot back.

IBR: What do you think were the key strategic elements that helped grow the adidas brand in Canada?

MR: First of all, we're incredibly fortunate that the adidas brand has great products and a wonderful brand heritage through athletes and ambassadors who have worn our products in the past. It's phenomenal to be able to tap into that kind of legacy.

Having said that, you can't rely on your legacy alone. We operate and compete in a really emotional category around sports footwear and apparel. Our brand positioning is focused specifically around creativity; we have competitors that talk about hard work and effort and potential, so having a unique voice was the starting point of differentiation. Over the last two or three years, I think people have recognized that we have a fresh take and unique position within the market.

We follow that up with innovation in product, whether it's our Boost products in running, or partnerships and unique initiatives to then amplify that brand positioning. People have seen a lot of consistency in our messaging and our efforts to the point where they trust our direction. They align with the values of the brand and want to be a part of where we're headed. In my mind, that's what's really helped propel us forward.

IBR: As Vice President of Reebok Canada, you developed partnerships with organizations like GoodLife Fitness; at adidas Canada, you established partnerships with the NHL and the CFL. How do you identify partner organizations that could be a good strategic fit?

MR: The most important thing is to start with a strategy because a lot of times, there's a temptation to select flashy partners or go after sexy partnerships. You really need to ground yourself in your strategy and what it is you're looking to achieve, and it then becomes a lot easier to select partners who align with that.

For example, on the Reebok side, in wanting to reposition the brand around fitness and coming from a heritage of sport associations with leagues and teams, it was important to find partners like GoodLife and CrossFit who embodied a focus on fitness. When the strategy is clear, you then look for partners who have similar objectives, values, and principles. It needs to be someone that you want to work with because it's important that you enjoy working together. Trust also becomes critical: in any partnership, you are essentially sharing your brand with somebody else. It is crucial that they have the same shared values and beliefs so you trust them to speak on your behalf when you're not in the room.

IBR: To date, adidas has limited colourways and styles of a few flagship sneaker models like the Ultraboosts, Yeezys, and NMDs. This has kept demand high and margins elevated. Do you see this trend continuing in newer shoes and will production limits always be kept to a few models?

MR: To me, this is the prototypical product life cycle management approach. With any of our franchises, there is a period where we want to incubate and in some cases, we don't yet know what the consumer response will be. Once you see that the consumer is responding to the product, that upfront scarcity in the development process does sometimes fuel interest and demand. Certainly, as a product becomes commercial, demand does increase and we do increase volumes, colours, or fabrications.

You do generally see a bit of a maturity phase in which the product becomes more available. You've referenced some very current models like the Ultraboosts and NMDs, but we also exercise portfolio management with iconic products like Stan Smiths and Superstars, which have been around for 50 years. There is a very strategic way to manage those: sometimes you'll reduce the amount of product in the marketplace leading up to an anniversary, for example, and then bring it back with renewed excitement and energy. So it's not just new franchises that we do this with, but you want to manage the product that consumers have access to so that it's always fresh and interesting to them.

IBR: Nike's decision to stand behind Colin Kaepernick has made it clear that companies' use of influencers represents a shared belief in values. How do you decide which influencers to use and where the organization stands on contentious issues?

MR: We're really clear on where we stand and on something like the topic of diversity, we actually have a very long history of supporting diverse athletes such as Jesse Owens or Terry Fox almost 40 years ago. As a brand, adidas has always stood by and supported diverse athletes of many walks of life. When that's embedded in your DNA, your values are very clear. We're not shy to speak out about that and to have a voice.

It goes back to that idea of trust—you're trusting influencers to represent your brands when you're not in the room, so you do need to do your due diligence to select them carefully and ensure they share your values and views. It then becomes stronger when they speak out on those issues. For example, we have a campaign around breaking barriers for women in sport on the adidas brand and a number of our athletes and ambassadors like Tessa Virtue are firmly behind the movement and are sharing the same messaging that we are as a brand. That's where the power of influencers really comes in. They can amplify the message because we share the same values and beliefs.

IBR: You're fortunate that your interests in sports and fitness align well with your role. Would you advise students to consider their personal interests when deciding in which industry they should pursue their careers?

MR: This is an interesting one—you're right, I really do think I am fortunate. Out of the 25 years or so that I've collected a paycheque, 23 of those years have been in sports. I think that it's somewhat rare to be able to enjoy a career that is almost completely aligned with your passion. However, what I will say is: differentiate between hobbies and interests, and passions.

I love sports, but I also have found in my career that I love coaching, I love mentoring, and I love leadership. Those are passions that I discovered through my career and they don't exclusively tie in to being in the sports industry. I think people should be open to and curious about the things that really do inspire them. If that is a hobby or an interest, and you are fortunate enough to combine that with your career, that is certainly an amazing experience. I definitely benefited from that, but sometimes you can put too much pressure to work in a business that's your passion. You may discover that there are other passions that can be discovered across industries and sectors. Keep your eyes open, keep your interests open, and you may discover that more things inspire you than just that initial passion you had before you started your career.

"Sometimes you can put too much pressure to work in a business that's your passion. Keep your eyes open, keep your interests open, and you may discover that more things inspire you than just that initial passion you had before you started your career."

IBR: You've described your younger self as a very reluctant networker. Do you have any advice for students who have trouble building a strong professional network?

MR: The short piece of advice is: get over it. I say that because I was there. I look at it now, and the importance of networking—particularly as you move through your career—is so crucial. It's not just to find a job or to network for business gain. I get so much inspiration and knowledge from my network. I've been able to connect with people in so many different industries.

In terms of how to get there, I would encourage people not to be apologetic or shy about asking for advice or help, especially early in your career. I think you might be pleasantly surprised by how many people are willing to help. As we evolve in our careers, we recognize that many people have been very impactful and helpful to us at some point in our journey. A lot of people are committed to giving back, so don't be afraid to ask.

I would also say to be mindful and prepared in terms of what you want to gain from a coffee chat or an interview. Be very specific, come prepared and be respectful of that individual's time. In turn, you are making an impression on them, and if you make a positive impression, it could come back to help you in ways that you don't expect somewhere down the road.

So, don't be shy, push outside your comfort zone, and it does get easier. As you build your network and get more comfortable doing it, more connections and contacts tend to come into your world as a result.

IBR: Do you have any advice or insights for students at Western or Ivey who are interested in pursuing a career in sports business, in particular?

MR: When I came out of Ivey, there were very few sports business programs anywhere in the country. Ivey didn't really have a focus on it, so I found my own way. A lot of times people have a very literal definition of the sports business, where it may be limited in their mind to professional teams, leagues, and maybe sporting goods brands such as adidas or Reebok.

However, I would encourage people to broaden their view of what the sports industry is. There are brands that sponsor sports properties and activate around sports. If you look at the banks as an example, there's a lot of brand work and marketing exposure tied to sports that might be an interesting way for someone to get access and exposure to the industry without working for a team, per se. There are so many digital partners out there now, and agencies and analytics companies that are servicing different components of the sports industry. It can be very difficult to break into the industry if your focus is solely on working for a team or a league, but if you start to expand your scope, it does open up a bigger set of opportunities.

I would also say: be interested in more than just sports. During interviews, a lot of people tell me that they are huge fans of hockey or soccer. That's great—I don't want to diminish that—but that's not really something that is going to differentiate or distinguish you during the interview process. I would encourage people to be curious about the business of sports, so really take the time to learn about companies, the industry, and the trends that are affecting the business. It's great that you may be a Toronto Maple Leafs fan, but go beyond that and show that you really have a curiosity in what's driving our business. Bring expertise, analytics, and a curiosity to learn—and make sure that comes through in any interview you have.

ALPHABET: WHY CLOUD GAMING MAKES (AD)SENSE

By making investments in cloud gaming, Alphabet can improve its advertising segment through deeper insights into users' behavioural and social data

Ean Johnson

Illustration by: Alvin Tse

A New Challenger Approaches

Google and its parent company, Alphabet, are not companies typically associated with PC gaming. However, in 2018, Google announced a limited-time, cutting-edge game streaming platform: Project Stream. The platform used Google's infrastructure to run a video game, Assassin's Creed Odyssey, on cloud servers and transmitted user input and gameplay back and forth between the user and Google. This configuration ensured that, regardless of hardware specifications, users could play resource-intensive games so long as they had a stable internet connection.

While this concept of running games off-site is not new, Google's trial demonstrated that relatively complex games could take advantage of such a system with minimal lag. Judging from user feedback, Project Stream was a resounding success. While the trial lasted just over three months, Google announced in March 2019 that it would be relaunching the platform as a permanent service under a new name: Stadia.

Stadia's Place in the Alphabet

Rather than building out Stadia as a standalone product, Alphabet should use the platform to drive new value to its core advertising segment by collecting users' behavioural data.

Alphabet classifies its operations into two business segments: Google and Other Bets. The latter contains emerging businesses which the company deems "not individually material," but which have great potential in the medium to long term. While Stadia does offer the potential to generate revenue for the company, the opportunity pales in comparison to what could be unlocked by projects in Other Bets like Waymo, Alphabet's venture into self-driving vehicles.

To put this into perspective, the Entertainment Software Association estimates that 150 million Americans played video games regularly in 2018. If Stadia implemented a subscription model of $10 per month, Alphabet would have to capture 10 per cent of the entire U.S. gaming market just to increase 2018 revenues by 1.3 per cent. Instead of focusing on Stadia as an immaterial revenue-generating opportunity, Alphabet should position Stadia as an ancillary service—similar to Gmail and Google Maps—to bolster its core advertising business, which accounted for 85 per cent of 2018 revenues.

Using Stadia to Power Personalization

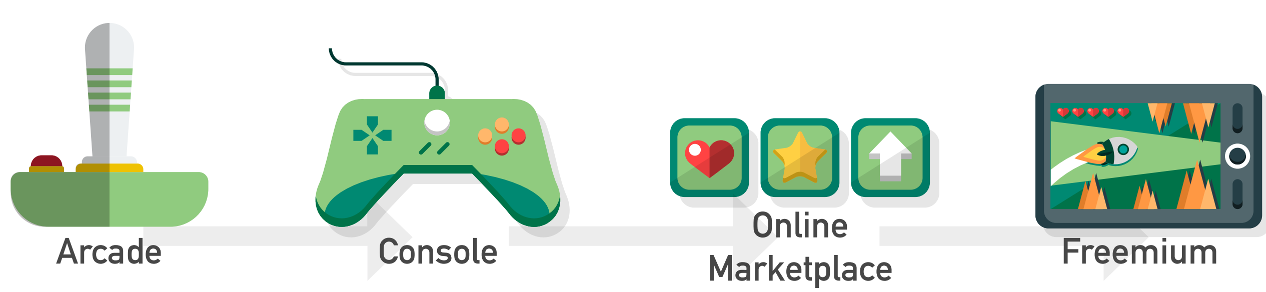
Video games have evolved far beyond arcade-style games like Pong and Space Invaders; many modern games give the user freedom to define the games' objectives and ask users to make a myriad of choices to determine the games' outcomes. Alphabet should gather data on the decisions made while playing video games through Stadia and use the collected information to better target Google's ads. There are countless instances in a video game where players must make a choice to proceed and by keeping track of choices, Alphabet can develop a Google account-linked behavioural profile for the user.

For example, a game may present players with the option to purchase either Item A or Item B. Item A is highly cosmetic but expensive and rare in the game, serving as a status symbol among players. Item B, on the other hand, is reasonably priced but common among players and practical for gameplay. In this scenario, the player's selection could help Google determine whether an advertisement for a luxury winter coat like Canada Goose or a more accessible one like The North Face would have the highest chance of generating a sale when displayed to the player.

This data is most applicable when collected from multiplayer games with virtual economies, since in-game currency must either be purchased with real money or earned over long periods of time. With both time and money at stake, the player's spending decision will be more deliberate and indicative of real-life behavior.

While the in-game decisions made by a player do not perfectly map to his or her exact offline behavior, the insights that can be gleaned are substantial. For example, a player's choice of virtual race and class seems to correlate

TIMELINE OF GAME DELIVERY METHODS



with his or her real-life political and ideological leanings. Such material insights from seemingly inconsequential in-game decisions suggest that a player's gameplay can lead to consumer understanding that Alphabet may not otherwise have been able to obtain.

Social Network

Alphabet could also take advantage of the social aspect of online gaming to better understand shared mindsets in a community. The company currently lacks a large presence in the global social media space: Google+, meant to challenge Twitter and Facebook, recently announced it would be shutting down its consumer-facing service in April 2019 after it failed to achieve widespread use. By offering Stadia, Alphabet could gain access to the list of Google accounts with which a player associates alongside other information, including the type and frequency of communication among players. By analyzing a player's social network, Google can make more accurate predictions about users through interests and habits shared among the group.

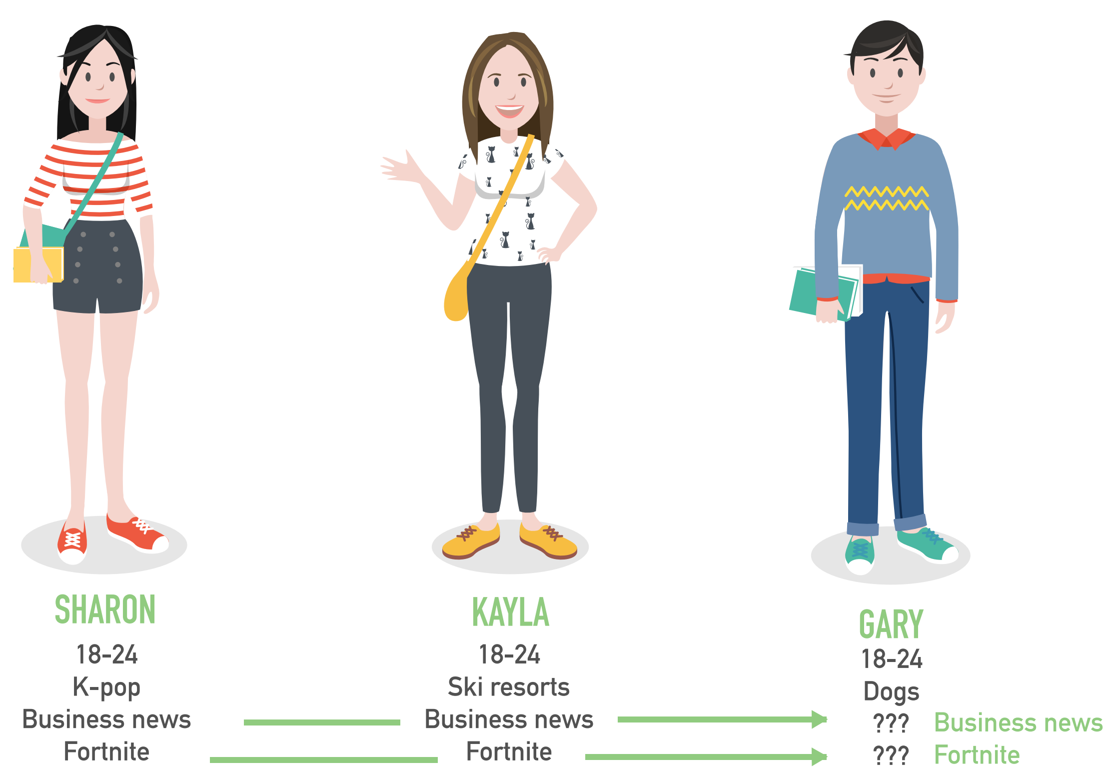
For example, assume Google has in-depth profiles for two users, Kayla and Sharon, whose interests are remarkably similar. Kayla and Sharon frequently play and chat with their friend Gary on the popular game Fortnite, but Google lacks a substantial amount of information about Gary's preferences. Under this recommendation, because Kayla and Sharon share preferences and associate with Gary, Google would be able to infer that Gary shares similar interests with Kayla and Sharon.

A Virtuous Feedback Loop

The data collected through Stadia would be beneficial to game development studios. Alphabet could share data from this platform, as well as from its other services, to give these studios a better understanding of the characteristics and preferences of their players. This would allow Alphabet to tailor future releases and downloadable content to its current user base's preferences, in turn better retaining players.

The data could also be used to recommend games to players given their existing preferences. Firms such as Netflix have succeeded in streaming by acting as a broker between consumers and content consumed. Netflix's focus on data analytics to drive customer engagement via Cinematch, its movie recommendation engine, has been credited as largely responsible for the company's success. Given that Alphabet counts analytics as one of its core competencies, an analogous recommendation system should be developed for video games through Stadia. The platform would be able to continuously guide users to games suited to their interests while collecting more diverse data to develop Google's behavioural profiles.

USING SOCIAL NETWORKS TO PREDICT USER PREFERENCES



Implementation Strategy

To accurately record users' in-game choices, developers would need to incorporate data collection checkpoints into their games. Even with the incentive of being exposed to a large end-market with Stadia, developers may still be unwilling to include this feature or might demand unreasonably large compensation for doing so. A reliance on third-party publishers is also risky as successful content could lead to unreasonably high licensing costs. To illustrate, Netflix reportedly paid around $100 million to WarnerMedia for the rights to stream Friends for one year.

Google has already moved to mitigate this risk with the announcement of Stadia Games and Entertainment, its own game development studio. Starting a game studio from scratch, however, slows down the large-scale rollout of Stadia's data collection capabilities. Triple-A titles have average development times of two to three years; should Stadia's first few releases not enjoy immediate success, the platform risks delayed adoption while new games are being developed.

Instead, Alphabet should look to acquire game development studios that already own popular titles into which it could then integrate behavioural surveying. This acquisition strategy is what Microsoft used to grow its game development studio in the early to late 2000s. During that time, Microsoft acquired Bungie, which has since produced the massively popular Halo series, and Ensemble Studios, which produced the Age of Empires series.

One potential acquisition target is Take-Two Interactive, the studio responsible for high-profile games series including Grand Theft Auto, Red Dead, and the sports-centred 2K. By acquiring Take-Two, Alphabet would have immediate ownership over unreleased games already published and a continued stream of presumably successful future games. Take-Two has significant drawing power with its titles: Red Dead Redemption 2 had one of the most successful launches in gaming history.

The wide-ranging appeal of these games coupled with their relatively high hardware requirements make them perfect for an initial foray into cloud gaming for users unable to play these games at their full fidelity. Additionally, Google's advertising capabilities would reduce marketing costs for major video game launches, which can amount to 75 per cent of development costs for the best titles.

Why Alphabet?

While competition within cloud gaming is likely to be intense, with existing pressure from Microsoft's xCloud offering alongside that from potential new entrants, Alphabet maintains a core advantage over other players. Unlike competing services, Google's core capabilities revolve around search and targeted advertisements; the company's ability to connect accounts across a variety of services and synthesize insights from multiple sources best positions it to capitalize on a system for cloud gaming. While behavioural data itself could be recorded and analyzed by anyone who can develop a similar product, the data's value is most useful if it can be both interpreted to yield the most insights and monetized by optimizing advertisements. This is especially important as Google looks to compete against players like Amazon and Microsoft, who have similar data analysis capabilities but lack the advertising reach.

Additionally, the firm's core search business requires minimal capital investment to drive its growth. As of December 31, 2018, Alphabet held more than $16 billion in cash and cash equivalents alongside another $92 billion in marketable securities. A portion of these assets could be deployed on the acquisition and with the best game titles costing upwards of $200 million to market and develop, Alphabet has the resources required to fund future development. The company's culture furthermore supports risk-taking and "moonshot" projects, so the unconventional acquisition of a video game development company would not be entirely unrealistic.

To minimize privacy concerns, Stadia's terms and conditions would communicate that data would not be sold to external parties but would solely be used to improve the user's experience with Alphabet products and services. Ultimately, if Stadia offers enough of a benefit to users, most users' privacy concerns, if any, would be outweighed by the service offered.

Moving Forward

In the future, Alphabet can continue to strengthen its position and data collection capabilities by acquiring and partnering with game publishers. As a consistent source of behavioural information, Stadia data could be used to bolster Alphabet's advertising capabilities and shared among the other business segments to help the company innovate in a sustainably superior way.

INTEL: **INNOVATING AT THE EDGE**

With the rapid adoption of IoT technology, Intel can derive value by focusing on novel applications of microprocessors

Nitish Dang and Satya Polavarapu

Illustration by: Selina Li

Innovation Since Inception

Founded in 1968 by Gordon Moore and Robert Noyce, Intel quickly made a name for itself as a world leader in computing technology. Just three years after inception, the company produced a chip that compacted the power of a 3,000-cubic-foot computer into a device smaller than a fingernail. This invention made possible the creation of the first personal computer (PC). More than 50 years later, Intel is the dominant manufacturer of central processing units (CPUs), which operate as the proverbial brain of the computer. At its peak, Intel held 82.5 per cent of the CPU market.

The Rise of Fabless Companies

While Intel has long held a leading position among CPU manufacturers, competitors' improved processing power has reduced this competitive edge. As an integrated device manufacturer, the company has to maintain the technological lead on both the design and manufacturing of CPUs. Aided by semiconductor foundries like Taiwan Semiconductor Manufacturing Company, fabless manufacturing—the process of designing the microchip but outsourcing manufacturing—is becoming increasingly affordable and prominent.

One example of such a fabless chip company is Advanced Micro Devices (AMD), which spun off its manufacturing capabilities into a separate company, GlobalFoundries, in 2009. With the launch of its Ryzen chipsets, AMD significantly bridged the gap in performance, providing a lower-priced alternative to Intel in the traditional consumer PC segment. Coupled with the delay in Intel's next-generation manufacturing capabilities, this gives both manufacturers and consumers significant cause to adopt AMD products.

Case in point: HP will adopt AMD processors in up to 30 per cent of its consumer PCs. Similarly, in the Data Center segment, AMD is set to launch its next-generation EPYC chips in 2019 as a higher performance and lower Total Cost of Operation (TCO) option to Intel's Xeon series processors. In order to compete with AMD's lower TCO, Intel has been offering up to double-digit percentage discounts for its Xeon processors. Consequently, it is imperative that Intel look for new areas of use for semiconductors in which its manufacturing capabilities will provide it with a competitive advantage.

IoT Growth

One of the highest-growth segments in semiconductors is the Internet of Things (IoT), which Intel competes in via its aptly-named Internet of Things Group. The term can be traced back to an internal presentation at Procter & Gamble in 1999, recommending the use of electronic identification in its supply chain. Today, it refers to a network of devices that are capable of collecting, processing, and sharing data with the network.

IoT devices are traditionally "dumb" objects that have had basic computing and networking functionality built in to allow them to communicate among each other. For example, Nest Labs produces a number of smart home devices such as the Nest Temperature Sensor, which uses basic networking functionality to communicate with a central thermostat in order to regulate temperature. When considering all related products and services, IoT is estimated to be a $520-billion industry by 2021, while the number of IoT devices is projected to reach 20 billion by 2020.

Technological Requirements

Fifth-Generation Networks (5G)—the next generation of mobile internet connectivity—can be differentiated from current 4G networks by their extra bandwidth, which is made possible by transmission over the super-high-frequency spectrum. In addition to having peak speeds nearly 20 times faster than that of 4G, the density of the network allows it to operate with near-zero latency, significantly improving responsiveness and reliability. The amount of data generated and transmitted across networks will inevitably grow with the number of connected devices. Consequently, current 4G networks simply do not have the bandwidth to keep up, especially given the network congestion caused by the communication of IoT devices. As such, the development of widespread 5G networks is a precursor to the widespread adoption of IoT.

Bringing 5G up to scale requires significant capital expenditure and collaboration among multiple stakeholders. Regulators and government entities still need to determine policy on spectrum bands, the frequencies on which the 5G network will operate, as well as security standards. However, given the widespread commercial benefits of the improved technology, telecommunications companies have announced that they plan to begin rolling out their 5G networks as early as this year.

Intel's Investments

Intel currently has a variety of investments that shape its future avenues for growth, ranging from manufacturing Graphics Processing Units (GPUs) to investing in the development of artificial intelligence (AI) software. GPUs are specialized electronic circuits that are capable of performing a narrow range of calculations extremely quickly and efficiently. Although they are most commonly known for powering graphically-intensive video games, they have a myriad of commercial applications, one of which is the processing and training of AI algorithms.

FOG COMPUTING

Although Intel is a leading manufacturer of CPUs, it does not have the same expertise in developing discrete GPUs. This is an investment outside of Intel's core competencies and a market that is already dominated by Nvidia and AMD. Similarly, Intel faces fierce competition in the market for AI software. Software development requires significant human capital, a resource that is being increasingly consumed by players such as Google, Amazon, Microsoft, and Facebook. Through their existing software services, these competitors already have access to large datasets that can be used to create robust AI models.

Intel has invested in the IoT market, highlighting it as a key business segment. The IoT Group currently contributes to five per cent of total revenues and targets the entire IoT value chain. Intel offers a broad range of hardware, software tools, and ecosystem programs, which again extends past its core competency of creating robust microprocessors. With this model, Intel faces stiffer competition than if it were to focus solely on delivering IoT chips.

A critical feature of IoT chips is their ability to perform edge computing. This is a decentralized form of processing data at its source rather than transferring the information to a central cloud server for computation. The major microprocessor manufacturers appear to have neglected to develop specialized chips, choosing instead to repurpose mobile or computer chips for IoT usage. However, these chips are often inefficient. Consequently, Intel can derive value by using its integrated expertise to design and build IoT-specific chips.

Clearing the Fog

Fog computing is an extension of the concept of edge computing, in which computing resources are shared among different smart objects in the network. This allows for better allocation of computing power, increasing both processing speed and capacity. Intel has already begun collaborating with other IoT players such as Microsoft and Cisco through the OpenFog Consortium, which funds research into fog computing.

To position itself for success, Intel should begin revamping its chips. Intel's current product offering in the IoT segment is the Xeon D-2100 processor series. Released in February of 2018, the Xeon D series are based on the Skylake microarchitecture already found in a variety of PC and server chips. In order to gain a foothold in the edge and fog computing markets, it is important that Intel make a low-TCO chip. This requires a granular redesign. Microarchitecture plays an important role in the energy efficiency and processing power of chips. As such, recycling Skylake in the edge computing chips is not a meaningful strategic step forward. To establish itself as a leader in IoT technology, it is crucial that Intel make a commitment to reducing the power usage of chips. Fog computing derives value from the shared use of computing power; each node needs to have a low TCO. Designing a new microarchitecture and chip takes substantial investment but is necessary to create a leading position within the fog computing market.

"Recycling Skylake in the edge computing chips is not a meaningful strategic step forward. To establish itself as a leader in IoT technology, it is crucial that Intel make a commitment to reducing the power usage of chips."

Use Cases

If Intel is able to successfully develop a market-ready chip, it stands to benefit from several use cases of fog computing in numerous industries.

Mining

A study done by the World Economic Forum in 2017 found that digital transformation in mining, including IoT and connected systems, could provide more than $425 billion of value to the mining industry by 2025. Specific applications of IoT in mining include predictive equipment maintenance, remote monitoring and control of equipment, and health and safety analytics. Devices in this industry can generate large amounts of data that need to be processed in the cloud. However, because most mines operate in harsh conditions hundreds of feet underground, connectivity to the cloud becomes an issue. By using fog computing nodes placed locally within the mine, most data can be processed on-site in order to drive real-time analytics.

Oil and Gas Pipelines

By implementing IoT, pipelines can move from a reactive approach to a predictive one. For example, sensors placed along the pipelines provide real-time metrics such as flow rate and pressure. Pipeline monitors can then watch for signs of major damage and act preventatively. Because data is processed locally, reliability improves drastically. In an industry plagued with health and safety concerns, these analytics could greatly improve safety and prevention.

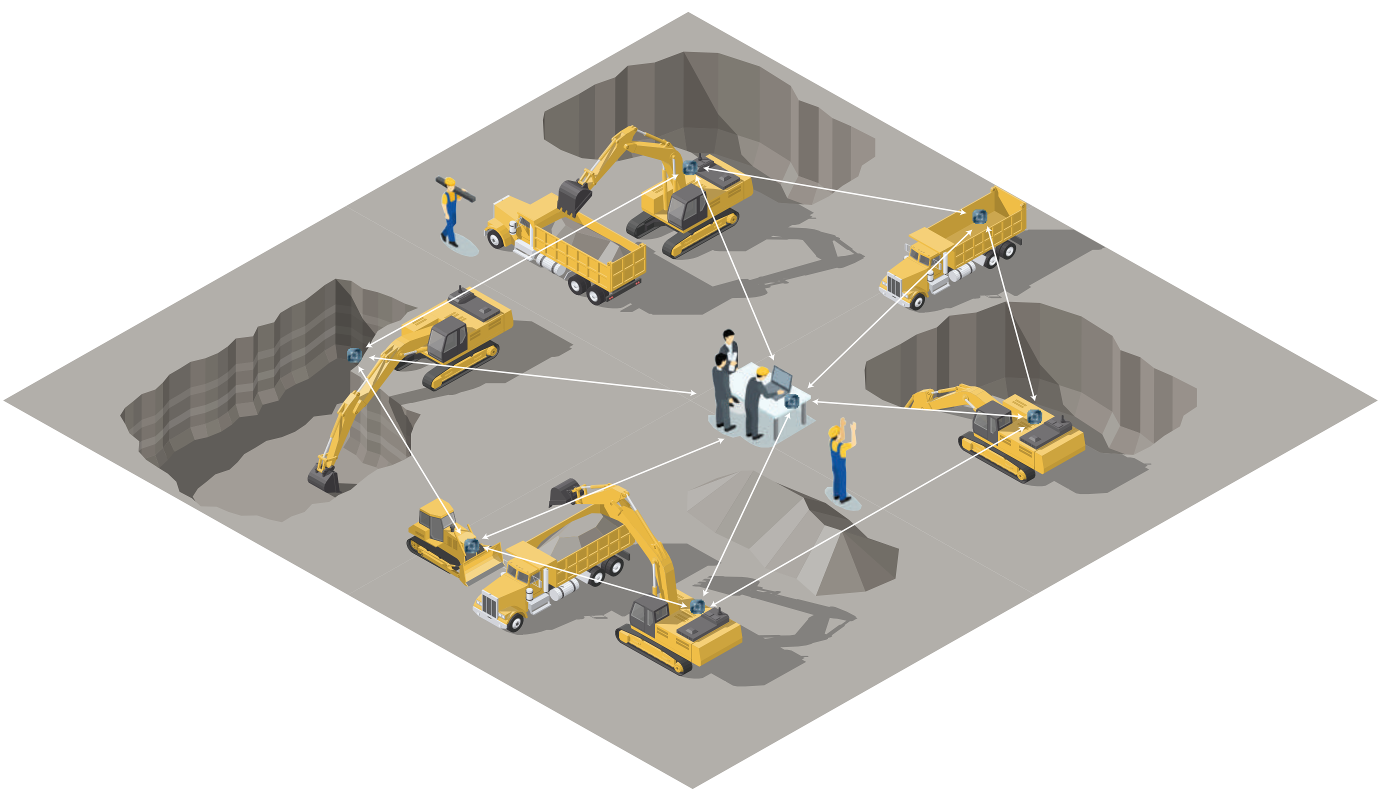
Healthcare

Modern hospitals use multitudes of connected devices to monitor, analyze, and treat patients. In an OpenFog Consortium report, the organization outlines the potential of using fog computing in patient monitoring. One commonly used device is the patient-controlled analgesia (PCA) pump, which allows patients to self-administer pain medication. Accidental PCA overdoses kill up to one thousand U.S. patients a year, an issue that could be solved using fog computing. Integrating fog nodes across medical devices such as blood oxygen and respiratory rate monitors with PCA monitoring would allow the system to process patient data and determine whether administering the next dosage of patient-initiated medication would be fatal. With the low-latency nature of local processing, real-time insights into the patients' health could be transmitted to medical providers and abnormal events could be reported quickly.

An Integrated Path Forward

Mining, pipelines, and healthcare are only three use cases in the world of IoT that could benefit from fog computing. Given the immense growth expected of the IoT market, Intel must find itself a place in the value chain. To make this a reality, Intel should develop a line of original IoT chips that can support edge and, by extension, fog computing. While its existing business segments face increased competition, the opportunity present in the nascent IoT industry will revitalize Intel's growth.

FOG COMPUTING IN MINING



REVLON-UTIONIZING BEAUTY

Reimagining the Revlon experience for working professionals will help the brand establish its niche

Serena Ismail

Illustration by: Amaara Dhanji

Not So PhotoReady

Since 1932, Revlon has been revolutionizing the beauty industry with the mission to prove that "the American woman could be as compelling and glamorous in everyday life as any starlet on the silver screen." From modest beginnings selling nail polish, the company has since expanded into cosmetics, skin care, fragrances, and personal care items. Despite its early success, Revlon has struggled in recent years as an increasing number of competitors have entered the market. The company must explore new strategies in order to regain its leadership position in the ever-changing beauty industry.

The global cosmetics market was valued at $508 billion in 2018 and is expected to reach $758 billion in 2025, growing at a compound annual growth rate of 5.9 per cent. The industry is fairly consolidated, with 45 per cent of the market dominated by large multinational companies that operate across various product segments. However, the rise of digital platforms and the increase in consumer willingness to explore new brands have lowered industry barriers to entry. As a result, the market is becoming more fragmented; independent brands experienced 42.7-per-cent growth while traditional brands declined by 1.3 per cent in 2016. Established and new brands alike are now fighting to cater to changing consumer tastes by advancing unique value propositions.

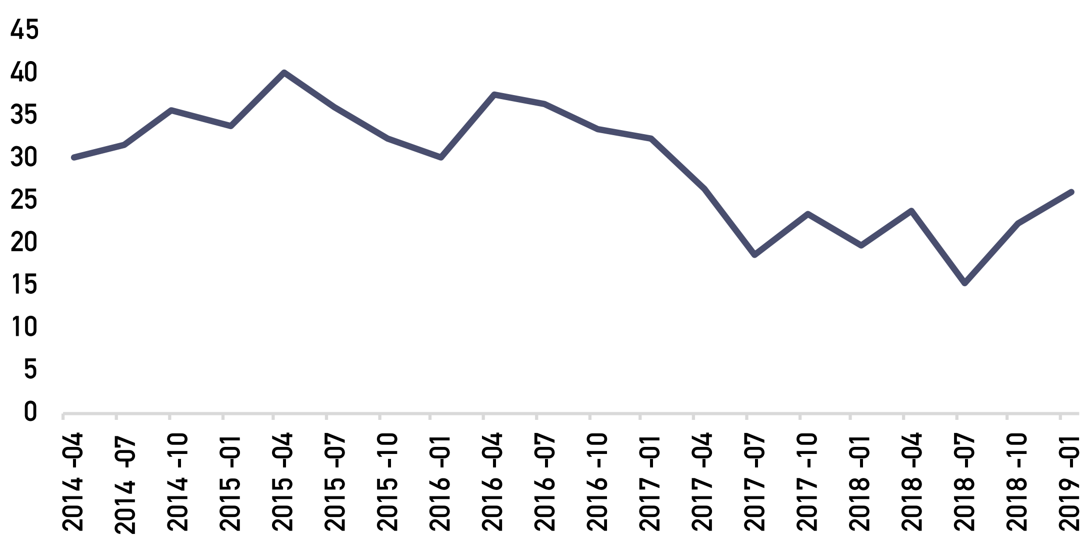
As a large player in this market, Revlon's core brand accounts for approximately 40 per cent of the company's overall revenue. The Revlon brand focuses on attracting mass appeal, with products in large retailers and convenience stores. This has allowed Revlon to compete as a one-stop-shop for the holistic cosmetic needs of each consumer.

However, with changing consumer tastes and the rise of new digital channels, traditional brand strategies have given way to a new cosmetic environment shaped by influencers and brand advocates. For example, the industry's direct-to-consumer beauty disruptor, Glossier, targets millennial women through social media. With digitally-created content and "Instagram-friendly packaging," Glossier has succeeded in facilitating word-of-mouth marketing and in capturing a sizable slice of the global beauty market. Cosmetic giant Estée Lauder has also recognized the need to cater to changing consumer needs. In 2016, it established a Customer Engagement Centre of Learning focused on gathering insights from diverse customer profiles to drive tailored innovation. Using these insights, Estée Lauder has evolved its online and retail experiences to provide unique customer engagements through virtual product trials and pop-up stores. The success of these competitors largely stems from their positive online presence and customer-centric marketing.

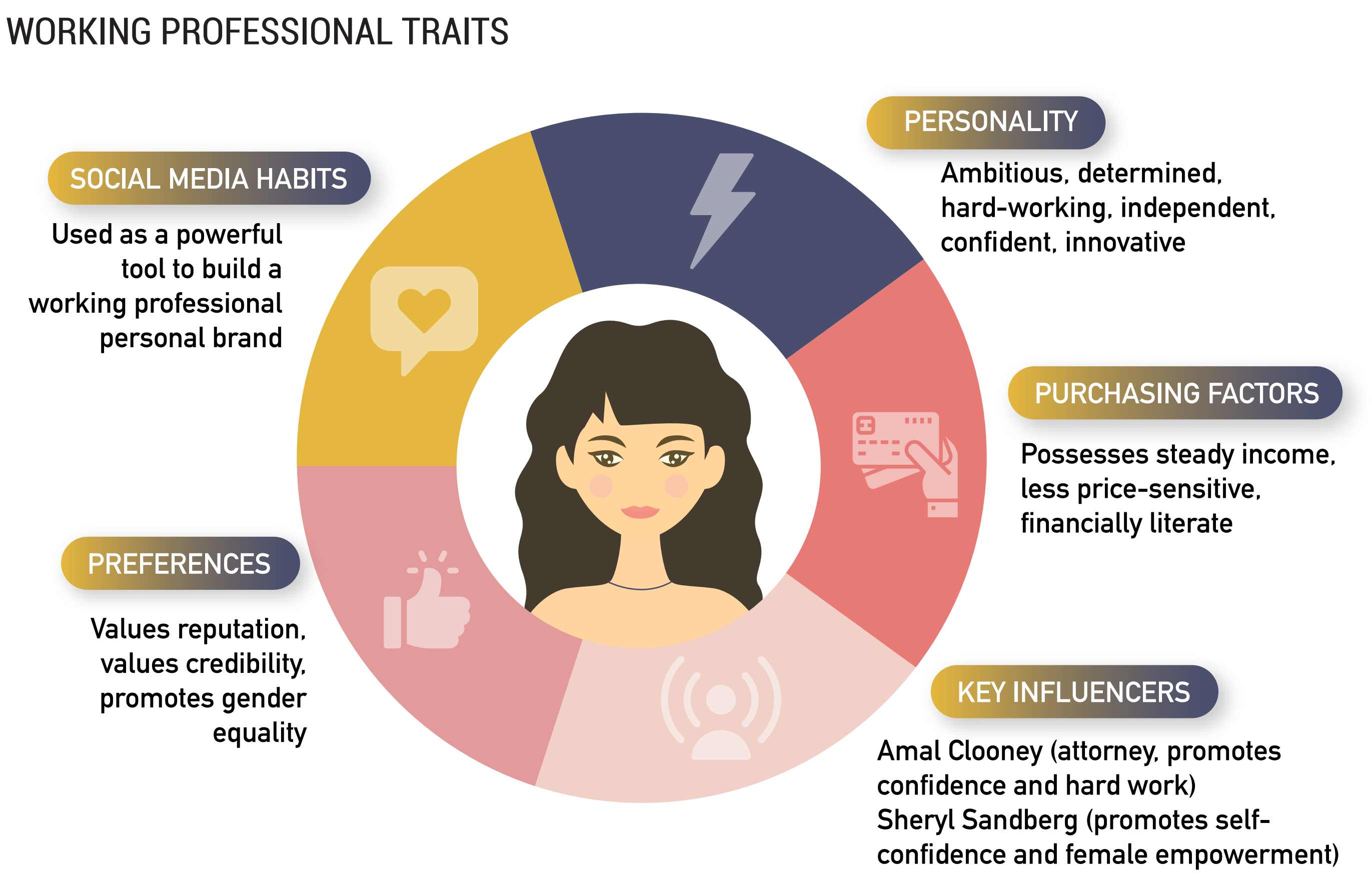
Revlon's failure to adapt to changing trends in the industry has caused significant financial loss. Despite implementing a new brand-centric reorganization plan in 2017, the Revlon brand realized a $76-million gross profit in the first nine months of 2018 compared to $98 million realized over the same time period in 2017. While the company has attempted to improve its financial position through an Optimization Program, these cost-saving efforts are ill-aligned with the company's long-term growth goals. Revlon must innovate to reestablish its position in the ever-growing beauty market.

Revlon previously attempted to address this in January 2018 with the launch of the Live Boldly campaign,

REVLON SHARE PRICE AT CLOSING (USD)



Source: Capital IQ



starring ambassadors such as Ashley Graham, Imaan Hammam, and Raquel Zimmermann. The initiative aimed to inspire women to "live unapologetically" and to "know no boundaries." Despite the positive messaging, the campaign failed to materially affect the fortunes of Revlon. The message of female empowerment has unfortunately become commonplace across the fashion and cosmetics industries. Simply projecting values through ambassadors is no longer sufficient; it will take action-oriented support of social justice campaigns to create the kind of positive brand association that can build a distinct brand identity.

A New Face for Revlon

In an age where perceptions of beauty are often defined by age or persona, a positioning shift targeting the professional working woman presents a unique opportunity for Revlon. To successfully capture this audience, Revlon should consider partnering with sites and organizations that target working professionals.

Platitudes are not enough; Revlon must demonstrate a real commitment to this market segment and boldly announce its intentions to the public. This can be best achieved through a three-step process: a large-scale marketing campaign to rebrand Revlon's core identity, industry partnerships to reinforce its commitment as the cosmetics brand of choice for working women, and local partnerships with collegiate organizations or professional networks to include the younger and mature segments of the working professional. Such partnerships would allow Revlon to more clearly associate itself with professional brands while creating channels to directly interact with these consumers.

Marketing Campaign

To initiate Revlon's rebranding, the company should revisit its origin, where its 1950s Fire and Ice campaign strived to "show the American woman that she could be as compelling and glamorous in everyday life as any starlet on the silver screen." In 2019, Revlon should transpose this message and "show the working woman that she can be as strong-willed and glamorous in everyday life as any executive in the boardroom." This basic revisit of the company's founding principle would send a strong message that Revlon has embraced a new vision for its brand. This would be followed by a strong marketing campaign featuring prominent female professionals that women would look up to as role models.

Industry Partnerships

The second pillar of this implementation should be partnerships with adjacent brands that cater to the professional market. These brands may range from professional development groups to recruitment platforms. LinkedIn stands out as an ideal partner in this context. A more specific marketing initiative that could arise out of this partnership may take the form of a campaign targeted at young females entering the job market. For example, when a young female professional signs up for LinkedIn, Revlon could send a "Get Professional" kit with two of its most successful products as well as style guide tips. LinkedIn could also complement the women's empowerment initiative through online mentorship groups and targeted offerings from LinkedIn Learning. Both brands aim to empower individuals to connect, feel confident, and reach their goals. The partnership with Revlon would allow LinkedIn to better engage female professionals while becoming involved in a meaningful corporate social responsibility initiative.

Other potential partnerships could take form through industry groups to reinforce Revlon's position as a brand that empowers the working woman. Examples of such groups include Women in Capital Markets, Ellevate Network, and the International Association of Professional Women. Revlon could provide the members of these groups with co-branded products, offer discounts on Revlon products, or provide perks from other partners in the network such as LinkedIn Premium.

Capturing Customer Life Cycle

Revlon must also take care to not alienate the peripheries of the professional market, namely students who may not yet see themselves as part of the job market, and mature women, who may feel ostracized if campaigns focus solely on young professionals. It would thus help to enter targeted partnerships with organizations that specifically engage with young and mature women to ensure that Revlon's message is just as compelling to these segments as it is to the core market. Groups that are characterized by these traits include campus clubs, entry-level job organizations, and school program services offices. On the other end of the spectrum, partnerships with women's executive networks or groups that help women with workforce reentry would maintain Revlon's brand positioning with mature women.

A Brand New Future

There is no doubt that the cosmetics industry is highly fragmented and rapidly evolving. Although Revlon was once viewed as the pioneer of the industry, its brand image is now lagging far behind its competitors and is in desperate need of modernization. A revolutionary rebrand combined with strategic partnerships would allow the brand to abandon its mass-market appeal, form a niche within the market of working professionals, and develop a brand that resonates with its target audience. These strategic recommendations would allow Revlon to maximize customer lifetime value, improve brand association, and ultimately reestablish its presence in the industry as a revolutionary in beauty for years to come.

"A revolutionary rebrand combined with strategic partnerships would allow the brand to abandon its mass-market appeal and form a niche within the market of working professionals."

CASPER: **SEALING THE DEAL**

As the bed-in-a-box industry approaches market saturation, Casper can differentiate its product through a manufacturing partnership with Tempur Sealy

Saad Afroz and Teimur Siddiqui

Illustration by: Matthew Tai

Disrupted Sleep

Founded in 2014, Casper held a simple value proposition: the self-acclaimed "sleep company" had a mission to improve sleep for as many people as it could possibly reach. The company introduced one mattress, in six sizes, that could be bundled into boxes, allowing them to be shipped directly to consumers shopping online. Backed by $239 million in venture capital funding, Casper is now the leader among online mattress retailers with a market share of 17 per cent. The company is largely responsible for propelling growth in the direct-to-consumer mattress category, referred to as "bed-in-a-box." In aggregate, online retailers account for 15 per cent of the broader $14.33-billion U.S. mattress industry.

Casper believed that the legacy system of distribution was primed for disruption. For nearly a century, the buying process relied on consumers traveling to an underwhelming brick-and-mortar outlet to chat with commission-based salespeople who often used confusing jargon and novelties like "heat-sensing memory foam" to pressure shoppers into purchasing high-ticket items. In an industry with high friction in the buying process, the bar was set low for companies like Casper to revolutionize the consumer experience.

Waking Up to Increased Competition

With the rise of e-commerce as a reliable distribution channel, bed-in-a-box retailers now represent a formidable threat to mattress incumbents. This new direct-to-consumer category has raised customer expectations in terms of customer service and ease of use. Subsequently, most traditional mattress retailers have started moving towards an omnichannel strategy, launching their own bed-in-a-box products.

As this new business model gained traction, low barriers to entry, including low fixed costs from the online model and the ability to subcontract distribution and manufacturing, resulted in increased competition. Furthermore, mattresses generally yield a gross margin between 40 to 50 per cent, allowing start-ups to recoup their initial investment and cover operating expenses relatively quickly. The bed-in-a-box market currently has nearly 200 competitors and consumers have mostly become comfortable with purchasing mattresses online.

However, the bed-in-a-box market is beginning to reach saturation. It is expected that bed-in-a-box as a percentage of the total mattress industry will plateau between 20 and 30 per cent. With current share nearing 20-per-cent, market share gains of existing players seem poised to stagnate.

Bed-in-a-box products have begun to be perceived as commodities, a reasonable sentiment as many competing players outsource distribution to the same manufacturing facilities. As a result, online mattress retailers have attempted to differentiate themselves by prioritizing research and development (R&D) and marketing to develop their brands and create sustainable competitive advantages. As demand for advertisements continues to rise with increasing competition, so does the cost incurred by online retailers. Sleep Number, a major manufacturer, has cited that the cost of certain key mattress terms on Google Ads has risen nearly 250 per cent in Q3 2018. As the industry transitions to maturity, select market leaders will emerge while inefficient players will struggle. Purveyors of minimally-differentiated products will face increased customer acquisition costs as they compete for consumers' mind share.

You Snooze, You Lose

Casper should be concerned not just by the sheer number of competitors in this industry, but by their high level of differentiation. Purple, for example, has built its brand around being the most innovative mattress company in the world, using a patented polymer material for its mattresses.

Established low-cost providers exist as well. AmazonBasics offers a foam mattress priced at $130, significantly below the average $1,000 price point charged by bed-in-a-box retailers. Analysts predict that Amazon's own mattress will eventually replace the majority of the 600 options currently available on the company's website. Amazon's distribution network and, more importantly, its ability to produce at significant economies of scale allow it to compete on price, something that most bed-in-a-box startups like Casper lack. However, it is important to note that experts do not believe that Amazon will be able to steal market share from the technical products made by traditional suppliers such as Tempur Sealy or Serta Simmons, given their reputation and scale.

With rising marketing expenses, differentiation through marketing has become an expensive and unsustainable long-term strategy for Casper. Last year, the company spent $80 million, more than 20 per cent of its 2018 expected revenue, on marketing. In addition, Casper's temporary advantage as one of the first movers in the online mattress retailing industry has been eroded by an increasing number of competitors offering high-quality mattresses at low price points. With only three mattress product offerings and limited manufacturing capabilities, the company lacks a long-term competitive advantage. Casper now finds itself in a difficult position where it no longer has a unique offering for its consumers—its mattresses are not substantially differentiated nor less costly than those of other players in the industry.

Tempur Sealy Partnership

Casper should explore opportunities to partner with specialized mattress manufacturers and establish a distinct position for itself in the market. Traditional mattress manufacturers have consolidated over the past century, becoming efficient at producing mattresses at a low cost. Taking advantage of these economies of scale and the production expertise of a world-class mattress manufacturer will help boost Casper's margins and give it the ability to play in both the low-end and high-end segments emerging in the direct-to-consumer category.

Specifically, Tempur Sealy, one of the world's largest bedding manufacturers, stands out as the ideal partner. Its proprietary Tempur material was created to adapt to the shape, weight, and temperature of the consumer, creating personalized sleep comfort and support. This technology is in direct alignment with Casper's own R&D, which focuses on managing temperature and reducing weight transfer. Whereas Casper is popular among millennials and priced at just outside of accessible, Tempur mattresses hold brand equity with consumers as a premium product, commanding retail prices upwards of $2,000. A partnership would lend Casper brand awareness with a wider variety of customers and give the company the credibility to sell a more upmarket product.

"Whereas Casper is popular among millennials and priced at just outside of accessible, Tempur mattresses hold brand equity with consumers as a premium product, commanding retail prices upwards of $2,000. "

Tempur Sealy also stands to greatly benefit from a partnership with Casper. In October 2018, Mattress Firm, Tempur Sealy's largest customer, filed for bankruptcy. Tempur Sealy has since been under pressure to make up for the associated 20.7-per-cent loss in sales. Its attempts to create its own direct-to-consumer retail channel have had limited success; operating margins have decreased, capital expenditures have risen, and profits have declined. Partnering with the leading bed-in-a-box online retailer Casper, will give Tempur Sealy a stake in the burgeoning direct-to-consumer segment without the need to invest heavily into forging its own channel. Tempur Sealy can instead remain focused on its expertise in manufacturing and wholesaling.

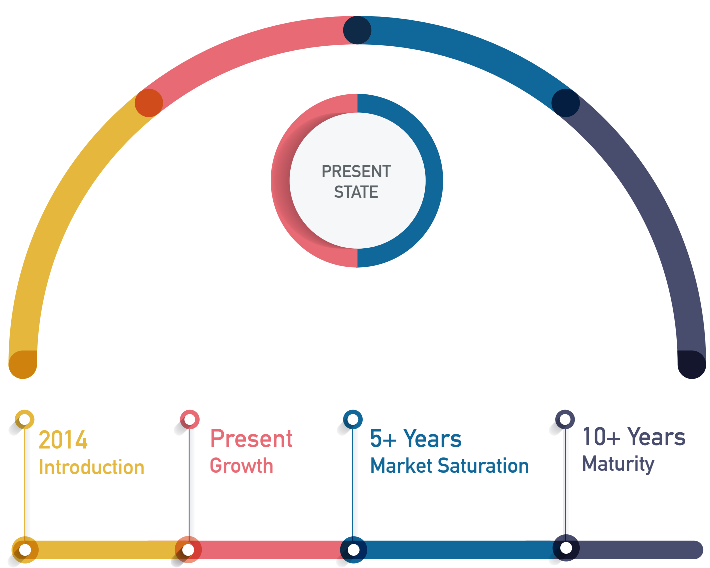
Co-Branded Manufacturing and Innovation

The opportunity that exists for collaboration between direct-to-consumer challenger brands and incumbent traditional retailers has become increasingly apparent. In September 2018, one of Casper's closest competitors, Tuft & Needle, merged with Tempur Sealy's main competitor, Serta Simmons. This alliance was successful in helping Tuft & Needle lower costs enough to produce a $275 mattress it now sells through Amazon. Meanwhile, Serta Simmons has benefited from Tuft & Needle's e-commerce infrastructure and capabilities, allowing more consumers to access Serta Simmons products.

Without undergoing a merger, Casper can obtain many of the same benefits. Casper and Tempur Sealy should collaborate to develop, market, and distribute a product using Tempur Sealy's industry-leading foam mattress technology and Casper's expertise in e-commerce retail and consumer marketing. In the near-term, Casper can use Tempur Sealy as a production partner for its current mattress lines, allowing Casper to reduce costs, differentiate its product, and develop a more sustainable advantage within the bed-in-a-box space. Casper also plans to open 200 stores over the next three years, complementing the introduction of a new product.

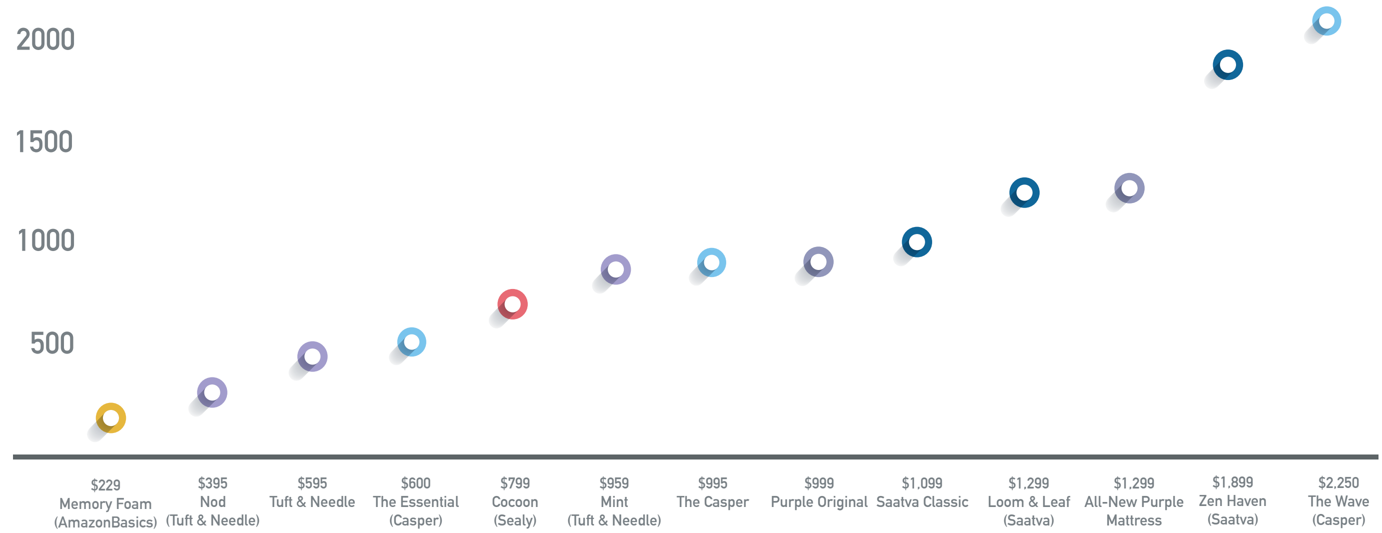
Finally, Tempur Sealy is the only true global player in the mattress and bedding industry, with wholly-owned and licensed manufacturing facilities worldwide. Casper's management has pointed to international expansion as

CASPER'S EXPECTED GROWTH PHASES



Source: IBR Analysis

PRICE COMPARISON OF MATTRESS OFFERINGS



Source: Barclays

the next major source for growth. Having a partner with global manufacturing and logistics experience will be invaluable as Casper takes that next step.

Don't Sleep on This Opportunity

The U.S. online mattress retail industry will bring in an estimated $2.2 billion in revenues in 2019, with around 27 per cent of sales coming from mattresses priced over $2,000. Assuming Casper can capture the same percentage of sales as it has in the overall online market (17 per cent), total sales for its co-branded premium mattress will be $97 million. If revenue is shared equally between the two partners, this opportunity could add an additional $48 million to Casper's sales—a 12.9-per-cent increase. This will contribute substantial growth to Casper, as the company experienced an estimated 25-per-cent sales growth from 2017 to 2018. More importantly, this partnership will help Casper establish itself as a differentiated player in the online bed-in-a-box category.

Filling Tempur Sealy's Revenue Gap

Given Casper's projected 2018 revenues of $375 million, its manufacturing business could be a considerable asset to Tempur Sealy. If Casper manufactures all its products through Tempur Sealy at the industry average of 50 per cent of the retail price, Tempur Sealy stands to gain $187.5 million in revenues, or an 8.5-per-cent increase to its top line. In addition, Tempur Sealy's percentage of revenues from the co-branded line with Casper would add $48 million in sales to Tempur Sealy, contributing to a total revenue increase of 10.3 per cent.

Springing Forward

Although the Casper brand is largely synonymous with the direct-to-consumer mattress category, increasing competition from new entrants as well as incumbents will make it increasingly difficult for Casper to distinguish itself from the crowd based on brand. Instead, the startup must look towards differentiating its product by partnering with Tempur Sealy. This partnership would not only allow Casper to retract production from the same plants that supply its competitors, but would also provide Casper with the keys to a premium product, supported by the Tempur technology already so well-recognized by consumers.

GAMESTOP: COMPETING IN A CROWDED ARENA

Facing e-commerce pressures and changing consumer tastes, GameStop should capitalize upon experiential gaming and eSports

Sean Gu and Jasmine Yang

Illustration by: Mercy Liu

Lagging Behind

The world's leading video game retailer, GameStop, traces its roots back to 1984—the same year the classic puzzle game Tetris was created. Gaming then was not yet a ubiquitous phenomenon and the company initially floundered under a series of unsuccessful owners. This changed when GameStop was spun off as its own entity in the early 2000s: the company capitalized upon the widespread gaming trend and experienced immense growth, catapulting revenues from less than $1 billion to more than $9 billion in a mere decade.

Despite the value of the global video game industry having ballooned to $135 billion in 2018, unit sales of video game consoles have declined 48 per cent over the past 10 years, from 89 million in 2008 to 46 million in 2018. The shift is largely attributable to the evolving gaming landscape, wherein the emergence of gaming alternatives like online free-to-play and mobile games is displacing traditional console video gaming.

As a result, GameStop has seen its growth stagnate. With no material increase in revenues since 2010, the company closed the doors on more than 150 of its GameStop-branded stores. The company has desperately sought a buyer in the private equity market to lead a strategic turnaround but has since abandoned these efforts. Faced with the rising popularity of alternate gaming models, the pressures of e-commerce channels, and no permanent CEO at its helm, GameStop finds itself struggling to adapt.

Out of Its League

More than 50 per cent of GameStop's revenue is derived from the purchase of physical hardware and software games. Sales of these products have declined recently as PC games have risen in popularity: physical game sales have fallen from 80 per cent of all U.S. computer and video games in 2009 to a mere 21 per cent in 2017. Although some customers are still attached to purchasing from their local video game store, overall consumer purchasing behaviours have changed significantly. More customers now value the convenience of purchasing through online channels while additional incentives—including discounts and flash sales—add to the attractiveness of digital purchasing. Sony, owner of the PlayStation 4 (PS4) gaming console, revealed that 32 per cent of its PS4 video game software sales took place digitally in 2017, increasing from 27 per cent in the prior year.

Furthermore, the proliferation of mobile devices over the last decade has proven effective at capturing first-time gamers, with mobile games expected to account for 51 per cent of the overall gaming market by 2020. Most of these games are free-to-play, with revenues arising from advertisements and in-game microtransactions where consumers spend real currency to acquire an advantage that improves gameplay. Such free-to-play models remove the need for pay-to-play retailers like GameStop from the value chain. In 2018, free-to-play games totalled $88 billion in revenues across all platforms while traditional PC and console pay-to-play gaming revenues came in at $16 billion. Gone are the days where gamers congregated in a basement over one screen split four ways; the industry value chain has been completely transformed.

Perhaps the most threatening trend to GameStop is the explosion in popularity of eSports, video game tournaments featuring professional-level competitive gamers. Much like in a traditional sports tournament, in an eSports tournament, professional players compete head-to-head for victory and prizes while audiences of casual players watch for entertainment. Such tournaments can draw huge crowds: League of Legends, a popular online game, recently held its World Championships in South Korea and attracted more than 200 million viewers. The eSports industry is projected to reach $1.5 billion by 2020 and with hundreds of millions of sponsorship dollars flowing in, eSports is seen as "the next big thing" in gaming.

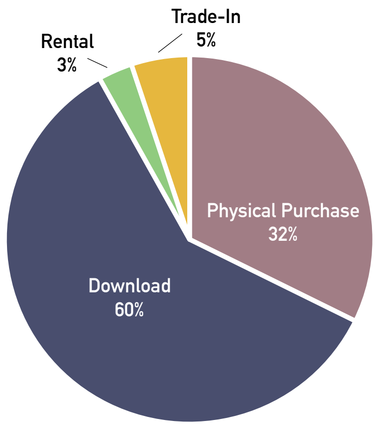
Player 2 Has Entered...

The last decade has seen a tremendous rise in social and immersive gaming experiences. These include virtual reality (VR) lounges, board game cafés, and internet cafés. In 2016, more than 5,000 board game cafés were opened in the U.S. alone. This proves that consumers no longer see

LEAGUE OF LEGENDS WORLD CHAMPIONSHIP UNIQUE VIEWERSHIP

Source: Riot Games, Statista

PREFERRED VIDEO GAME SALES CHANNELS



Source: Limelight Networks

gaming and entertainment as just an at-home experience, but are willing to pay to play at a dedicated venue.

One particularly successful business capitalizing upon this trend is Meltdown International. The company's franchised eSports bars are set up like a typical bar with an added gaming flair: eSports tournaments are live-streamed and gaming equipment is scattered around the bar. This value proposition has proven successful as the franchise has expanded into nine different countries as of March 2019. In contrast, GameStop's bare-bones store design emulates that of a pure retailer, lacking a dedicated social engagement space to appeal to consumers.

Levelling Up the GameStop Brand

To survive, GameStop needs to evolve its brand from a simple console and game retailer to become the home of an interactive, social gaming community. GameStop should seek to develop several large physical spaces in urban areas into full-service, experiential gaming and social lounges, under the name "GameStop XP." By introducing console and PC gaming as a premium experience, GameStop can transition into an entertainment facility that hosts online games, console games, VR, and live events, all under one roof.

Elevating GameStop's brick-and-mortar storefront model with a dedicated tournament space and high-performance gaming setups will appeal to gamers of all experience levels. Whether gaming veterans looking to compete at in-house tournaments or amateurs testing out a game in-store, GameStop can become the go-to social space for members of the gaming community.

GameStop's Edge on the Tier List

This modern twist on the traditional LAN (Local Area Network) café model has seen a resurgence in popularity with the rise of eSports. Catering to this trend, modern gaming cafés are replacing serious gamers' premium PC setups. Gamers are not only attracted to the high-quality setup that outperforms their devices at home, but to the social experience of playing with their friends live and meeting others in the gaming community. These gaming cafés have already proven successful in urban hubs such as New York, with several hybrid gaming cafés earning high foot traffic and positive customer reviews.

In contrast to gaming cafés, which are often owned and operated by small or individual operators, GameStop has the advantage of using its nationally-recognized brand to implement this initiative. Furthermore, GameStop can partner with collegiate eSports clubs, which have emerged at more than 125 campuses across North America in the last decade. These clubs are constantly hosting tryouts, practices, and tournaments, and sometimes see their players move on to the professional leagues. By positioning its stores in urban areas close to colleges and universities, GameStop can access another source of customers and rapidly increase brand awareness through in-house events.

Cashing in the Gold

Beyond fees paid at the door, this experiential model can help drive profitability to other segments while addressing GameStop's biggest challenge of gaining foot traffic. This hybrid business model allows for significant cross-selling of GameStop's traditional games and console products. For example, gamers who appreciate the sound quality of the gaming headset used in the GameStop XP lounge could immediately buy one on-site. Furthermore, GameStop can strategically boost collectible product sales by catering its selection to reflect characters from the most popular eSports games being played in-store.

Most importantly, this new model can help GameStop improve the effectiveness of its existing PowerUp Rewards system. The current membership program allows customers to earn points that can be used towards coupons and sweepstakes. To better complement the new gaming lounges, the rewards program can offer multiple tiers of monthly memberships, which provide various hours of access and benefits within the GameStop XP stores. Furthermore, the gaming lounge provides another opportunity for customers to earn points, as points can be offered in addition to physical prizes at weekly tournaments and events. By charging a monthly membership premium, GameStop can gain an additional source of stable cash flows while incentivizing more frequent customer visits to help increase traditional game sales.

Laying Down the Game Plan

In addition to downsizing the in-store inventory space, the new GameStop experience will include the following additions to existing stores: a viewing lounge, gaming space, and VR experience.

Smaller Retail Space

GameStop should downsize its inventory of games to reduce the amount of space dedicated to retail sales. However, it should continue to sell a variety of merchandise, gaming accessories, and hardware for customers to purchase after their visit. Adding to the experience, a variety of consoles and video games should be distributed throughout the lounge to expose gamers to GameStop's products and to promote inventory sales.

Viewing Lounge

The viewing lounge would provide a space to broadcast in-house tournaments and live-stream major competitions, with light snacks and refreshments offered. An open concept would promote an interactive environment for gamers to socialize and cheer on the competitors. For this segment, GameStop should seek out partnerships with collegiate eSports clubs to host the clubs' existing tournaments and obtain event booking revenues for the space. These partnerships would be appealing to these clubs as GameStop would provide a high-quality tournament venue along with game setup and technical expertise. In addition to external tournaments, the space could be used for professional player meet-and-greets, GameStop-run tournaments, and other events.

Gaming Space

A gaming area should be made accessible for customers who pay a one-time entry fee or who have a membership pass. This area would be complete with high-performance gaming equipment including consoles, specialized keyboards, wireless headsets, and high-resolution monitors. This area could be used for regular play by customers, for in-house tournaments, and as a rental space for external clubs' tournaments. To ensure the space is best designed to suit customers' needs, GameStop should consult a range of gaming professionals and eSports clubs during the planning process.

VR Experience

To diversify the activities offered at GameStop, a VR gaming lounge should be added. The technology is still relatively expensive and has low penetration in gaming households, creating an attractive value proposition for game enthusiasts. Similar to how entertainment centre The Rec Room operates its premium VR area, GameStop can charge an additional premium to guests wishing to experience this technology.

Existing Brick-and-Mortar Locations

Alongside the rollout of GameStop XP stores, existing brick-and-mortar locations could be renovated to parallel the new experiences offered at GameStop XP while retaining the original GameStop branding. This allows GameStop to preserve its brand legacy while simultaneously bridging the shift towards experiential gaming. Because current GameStop locations are constrained by size, with the average store being 1,700 square feet, a lighter set of services would be installed. The stores would operate a hybrid model, incorporating both shelves of physical merchandise and services like VR gaming and a small number of PCs. These experiences would provide passersby with a sample of the full suite of options available at GameStop XP. Given that many GameStop locations are situated in shopping malls and high-traffic retail locations, these stores would serve as powerful marketing tools with the potential to drive significant new audiences to GameStop XP.

The End Game

GameStop should prioritize an initial roll-out of 10 stores across major North American cities that have historically seen a significant amount of gaming and eSports activity, such as Los Angeles, San Francisco, New York City, Seattle, and Toronto. In addition, stores should ideally be in close proximity to local colleges and universities to both establish partnerships with collegiate eSports clubs and cater to young adults between the ages of 16 to 34 who make up 73 per cent of the consumer demographic in the eSports industry.

Over time, GameStop should launch more experiential stores and transition into a full-fledged entertainment company. With the data from initial stores in hand, GameStop can cater its offerings to each new region it enters. For example, this pilot data may reveal that GameStop should offer more consoles or party games in suburban areas while customers at stores near colleges may want to see more PCs.

The timing for a strategic overhaul could not be better for GameStop. With the completion of a $700-million divestiture of one of its business divisions in January 2019, the company has the financial resources needed to reinvest into its future. Through the launch of GameStop XP, the company can capitalize on the immense growth opportunity in eSports while lifting its brand from an outdated physical distributor of traditional console games to an all-inclusive experience designed for all gamers.

IMPACT INVESTING: **A MATTER OF MEASURE**

Lacking in measurement standards, accessibility, and information distribution, impact investing platforms should partner with NGOs to develop a third party auditing system

Madison McNevitts

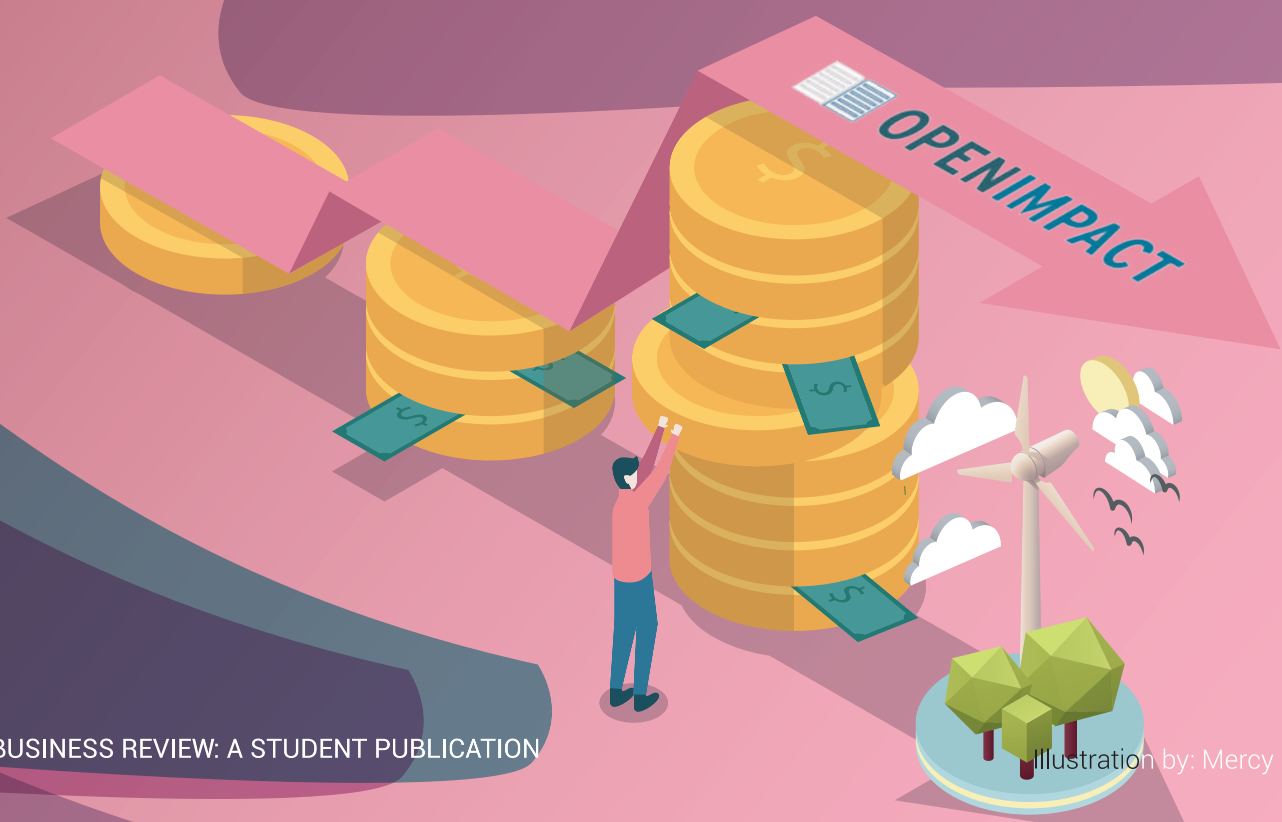


Illustration by: Mercy Liu

A History of Sustainable Investing

In 2015, the United Nations released 17 Sustainable Development Goals aimed at helping countries solve pressing issues including poverty, inequality, and climate change. These goals focus on integrating economic development, social inclusion, and environmental sustainability into future development plans. While the goals offer a valuable, codified directive for governments and businesses, they ultimately reflect universally accepted ideas: people and corporations have a responsibility to look after the most vulnerable and protect our environment.

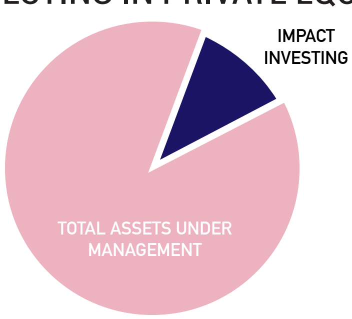
Ralph Nader's 1965 exposé *Unsafe at Any Speed* tapped into a new wave of public concern about businesses that do not act in the public good. More recently, concerns about market economies' abilities to protect society's most vulnerable have been exacerbated by an increasingly globalized and knowledge-based economy which has left unskilled workers behind, while a lopsided recovery from the financial crisis has also called into question the fairness of financial markets. In fact, the share of the population with "little or no confidence" in businesses has risen from 26 per cent in 1979 to 39 per cent today.

As a result, consumers are more concerned than ever, demanding socially responsible behaviour from corporations. In the coming decades, this trend will accelerate as socially-conscious millennials inherit wealth from their baby-boomer parents.

Recognizing changing consumer preferences throughout the twentieth century, businesses understood that they needed to look beyond financial performance for their decision making and that they also had to consider their social and environmental impacts to avoid alienating customers. This was manifested in the rise of Corporate Social Responsibility (CSR) and the entrenchment of CSR as a ubiquitous term in strategy literature.

This change in corporate culture coincided with a new set of investing principles, resulting in the rise of Socially Responsible Investing (SRI). SRI involves evaluating investment opportunities not only based on their expected financial return, but also on their ability to promote ethical and sustainable business practices. Sustainable investing has grown rapidly as investors now consider environmental, social, and governance (ESG) factors across $12 trillion of professionally managed assets, a 38-per-cent increase since 2016.

IMPACT INVESTING IN PRIVATE EQUITY



By 2020, impact investing will account for $300 billion of the over $2.9 trillion managed by private equity firms worldwide.

Source: McKinsey & Company

While consumers responded well to CSR initiatives and sustainable investing practices, they have remained skeptical about the true intentions of corporations and investors, as demonstrated by the increasing mistrust of the private sector. Consumers are often concerned that CSR initiatives are considered a marketing expense for companies while doing little to align the underlying incentives of the core business with socially desirable outcomes.

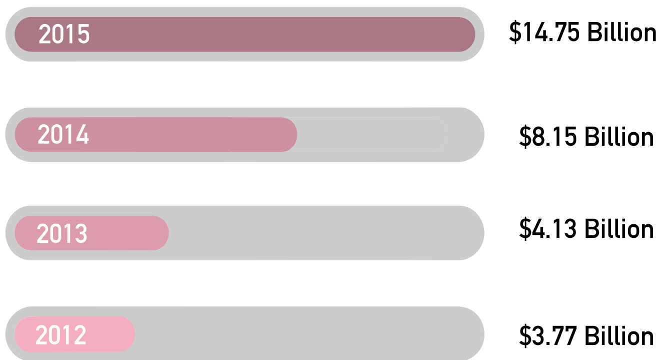
In response to some of these concerns, there has been a marked shift from CSR initiatives to a model focused on sustainably aligning incentives: Creating Shared Value (CSV). Whereas CSR initiatives are treated as cost centres, CSV argues that a company's competitiveness and its community's health are mutually dependent, implying that business decisions which create shared value are a profit centre.

One can think of the difference between CSR and CSV as the difference between Chevrolet announcing a new tree-planting initiative to offset its cars' environmental impact—a cost centre to improve brand palatability—and Chevrolet announcing the production of the all-electric Volt: a profit centre which directly aligns the incentives of consumers and Chevrolet. While the introduction of CSR initiatives was mirrored by the growth of sustainable investing practices, the mainstream integration of CSV is likely to coincide with a new funding model: impact investing.

An Overview of Impact Investing

Impact investing is the process of investing in companies, organizations or funds to generate social or environmental impact in addition to financial returns. This can include investments in initiatives such as affordable housing projects, renewable energy companies, and health care clinics. While SRI also accounts for the ESG impacts of an investment, its ultimate goal is to minimize the financial risks posed by ESG concerns. Impact investing, by contrast, intentionally and purposefully seeks to achieve a positive social outcome from the investment. Moreover, impact investing measures and incorporates this impact into the risk-return profile of an investment while SRI does not. Consequently, impact investors may make concessions on financial returns if the social impact outweighs the decreased return proportionately.

IMPACT INVESTING IN CANADA



Source: RIA Canada

Moreover, the fact that impact investments can often be entirely uncorrelated with the market makes them extremely attractive. For instance, the payout of Goldman Sachs' recent Social Impact Bond in Utah—focusing on improving pre-kindergarten education to reduce reliance on special education—was dependent on the students' academic success. Even impact investments with market exposure appear to perform on par or better than traditional investments, as evidenced by a recent meta-analysis of 2,000 studies on sustainable investing.

The total funds allocated toward impact investments are expected to reach $300 billion worldwide by 2020. Furthermore, a report surveying 82 asset management organizations showed an average growth rate of 13 per cent per annum from 2013 to 2018 in their impact investing assets under management. Firms such as BlackRock, Credit Suisse, Goldman Sachs, and JPMorgan Chase have also included impact products in their portfolios.

Problems Affecting Impact Investing

Despite growing interest from major business publications, research firms, and institutional investors, coverage of impact investing still eludes mainstream media and financial curriculums. Often mistaken for SRI products, ESG investing, and microfinancing, the lack of widespread knowledge in impact investing has stunted growth. This is compounded by the lack of advisor knowledge. Consequently, awareness and accessibility remain issues as many investors are unaware of the investment vehicles available.

Many of the challenges affecting impact investing stem from the difficulty of standardizing impact measurements, which reduces the usability and reliability of impact return metrics. Consider an educational enterprise seeking to improve the knowledge and skills of a community with the ultimate goal of helping the residents escape poverty. Ideally, a return metric would be outcome-based—it would track the community's improved skills. Instead, the only available information would typically be efficiency-based, such as total enrollment.

Ultimately, the majority of current metrics do not take into account the relative efficacy of an investment's strategy, but instead only report on the investment's performance and ability to execute. Even if such metrics were readily available, there would be substantial costs for data collection and analysis, the metrics would not be widely understood, and the technological infrastructure would not exist to include the metrics in standard data aggregators or analysis tools.

Finally, the lack of a standardized external auditing and control apparatus introduces additional accountability issues. Typically, impact measurements are self-selected, and unlike reports on a company's financial performance, impact assessments are not subject to strict regulations by dedicated governmental bodies or mandatory third-party audits. Moreover, because the metrics used in these assessments are self-reported, they may not capture the actual impact of the investment. Imagine an affordable housing project which successfully provides many low-income families with housing, but also causes a collapse in housing prices, diminishing the wealth of the rest of the community. It is likely that the firm would not consider such externalities in its reporting, thus overstating the project's positive social impact.

Innovators in the Space

While there are significant challenges in the impact investing space, there are numerous innovators aiming to solve the problems limiting the sector's growth. One such example is OpenImpact, which attempts to improve the accessibility of impact investments to investors by compiling key information for dozens of investment opportunities in an easily searchable manner. The website allows investors to screen using filters such as Sustainable Development Goal alignment, geographical region, and investor eligibility. OpenImpact also links investors to the websites of the businesses and funds represented on the platform. Although OpenImpact relays limited quantifiable information on the actual social impact of different funds, the website represents a step forward in allowing the average investor to allocate capital to the impact space.

Currently, OpenImpact uses a measurement taxonomy named IRIS 4.0 to categorize investment funds based on social and environmental impact objectives and target demographics. IRIS aims to create a standardized approach to measure the total financial and social returns of a variety of enterprises. Companies can individually measure their desired impact using IRIS metrics categorized by sector, beneficiary, operational impact, and financials. For instance, a company working to improve literacy rates could use the "Student Transition Rate" metric, which measures the percentage of students advancing to the next grade level, as a factor in measuring impact. Funds then use these measurements in reports to investors to benchmark the performance of an investment against the desired social impact.

While IRIS represents a significant step forward in the standardization of metrics for comparability between investment assets, its 559 metrics are limited in measuring efficacy rather than efficiency. For example, despite the existence of the "Full-Time Employees: Total" metric that measures the number of individuals hired by the organization, there exists no metric in the framework to measure the resultant increase in economic activity generated by the increased employment.

Impact investing analytics firms such as B Analytics are also aiding in the development of the market. B Analytics markets a software platform that allows investors to easily store and collect impact data from its portfolio. The firm uses the collected data to generate benchmarks so users can compare their investment to other sustainable businesses, impact funds, and traditional investments. The company also advertises that the platform can generate reports with analytics and visualizations to improve the users' investments. Although the software suite offered by B Analytics is not yet as advanced as those offered for SRI or traditional investors, the company's efforts in modernizing data collection and analytics in the impact investing space have the potential to truly help impact funds be more successful.

While many innovators have made tremendous strides in bringing awareness to the space and improving accessibility through aggregating investment opportunities, several issues remain that pose a threat to the growth and credibility of the space: the difficulties of measuring the "impact" of impact investing, improving accessibility for investors with different risk-return objectives, and integrating impact assessments into mainstream finance and investing platforms.

NGO Partnerships

Social impact innovators would benefit from the establishment of a strict auditing regime built on cross-sector partnerships to capitalize on a rise in social engagement and greater demand for impact assessment. Several NGOs and other non-profits are already working to address some of society's largest problems. As an example, OpenImpact could develop partnerships with these NGOs, using them as objective auditors to measure the social impact of investments in that NGO's realm of expertise. This would add credibility to the impact investing space, as OpenImpact could pre-screen companies and require them to agree to a quarterly impact audit, akin to public company financial reporting requirements, as a prerequisite to being listed on the platform. By adopting these processes and reporting requirements, OpenImpact can give investors the necessary information to make better decisions while overcoming some of IRIS's limitations.

As part of such an arrangement, OpenImpact could finance these audits through a revenue-sharing agreement in which a percentage of each investment sourced through its platform would be shared with the auditor. This would provide these third-parties with predictable and sustainable funding, thereby reducing their reliance on external fundraising, increasing their objectivity, and allowing them to focus on their own organizations.

Furthermore, OpenImpact could augment its impact assessment capabilities by using information technology to collect real-time data and implement track-your-impact (TYI) initiatives. For example, a prospective investor and investee could agree on key performance indicators prior to an investment, and the investor could require a consistent flow of relevant data to ensure sufficient efforts are being made to meet the indicators. In practice, TYI initiatives can be used to replicate the venture capital model of funding. If an impact entrepreneur is looking to finance his or her idea, but interested investors are reluctant to provide a large lump-sum payment, they can offer seed funding along with conditional follow-on capital subject to the venture meeting agreed-upon objectives. This would allow different types of investors to participate in different "rounds" of funding, better matching investors with their appetite for risk and increasing the volume of impact investment funding.

Taking Impact Investing Mainstream

As the adoption of nuanced, efficacious metrics for impact measurement increases, the dissemination of this data will be crucial in advancing the mainstream adoption of impact investing. Common investing platforms including Capital IQ, Bloomberg, and FactSet have shown an interest in the implementation of ESG metrics from external platforms including Sustainalytics and MSCI to service investors practicing SRI. Moving forward, the proliferation of impact-focused measurements from similar platforms like B Analytics and data from OpenImpact's mandated audits will be essential in improving visibility and comparability for impact investing.

The power of impact investing lies in its ability to leverage the efficiency of capital markets while simultaneously aligning incentives to capture the positive intentions of traditional philanthropy. In doing so, impact investing is the best funding model to facilitate the mainstream introduction of CSV into corporate business models. However, failure to make improvements in measurement, accessibility across investor risk profiles, and integration into investing platforms will prevent impact investing from maturing. Strong support for accountability in impact measurement and the distribution of the resultant collected data will enable the industry to finally achieve mainstream visibility.

EXXONMOBIL: **CRACKING THE BARREL**

To hedge against volatility and lagging upstream assets, ExxonMobil should explore opportunities in emerging markets

Connor McLeman and James Newman

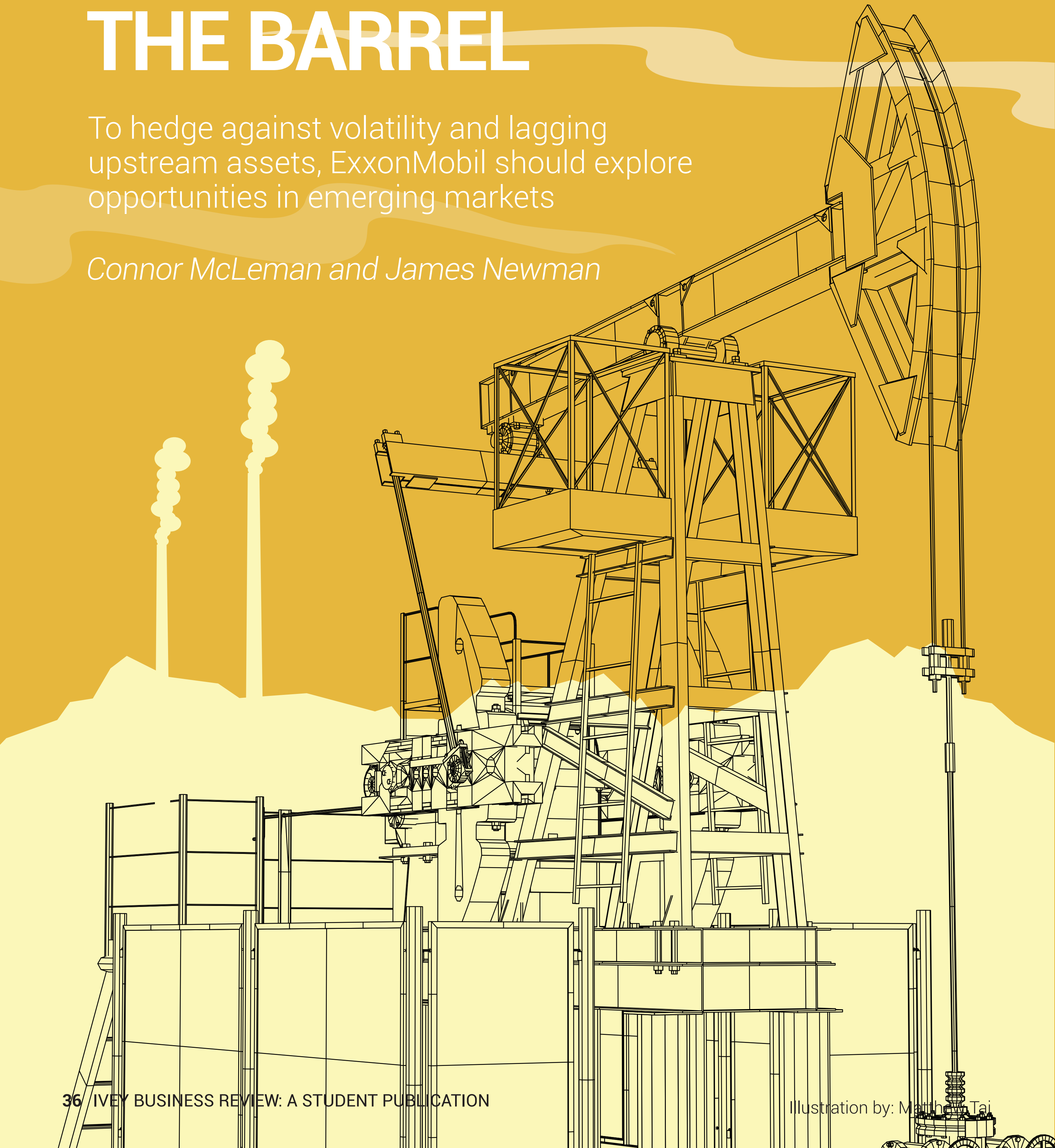


Illustration by: Matthew Tai

An Integrated Supermajor

Valued in early 2019 at more than $300 billion, ExxonMobil is the world's fourth-largest oil and gas company ranked by 2017 revenue. Each day, the company produces the energy equivalent of nearly four million barrels of oil, with production approximately evenly split between petroleum liquids and natural gas. As an integrated player, ExxonMobil has amassed a well-diversified, international portfolio of assets spanning the petroleum industry value chain.

ExxonMobil's success to date can be partially attributed to its focus on integration: each part of the petroleum production value chain is reflected in its three business segments. The first of these, Upstream, comprises ExxonMobil's global production assets spread throughout nearly 40 countries, while the second, Downstream, consists of 21 refineries located in 14 countries. Feedstock from both the Upstream and Downstream divisions act as input for the Chemicals division, in which a variety of chemicals—including polymers and elastomers—are produced for end use in everyday items like packaged goods and rubber products.

Oil's New Normal

As technological advances make unconventional resource plays economically viable, producers have shifted their portfolios to include oil and gas reserves found in oil sands and shale plays. The more technically challenging extraction processes associated with these unconventional sources increase energy companies' capital expenditures while also shrinking operating margins and increasing the risk of environmental damages.

The issue of shrinking margins for upstream extraction assets is exacerbated by the price volatility of its output, crude oil. While the early 2010s saw benchmark West Texas Intermediate (WTI) prices exceed $100 per barrel, prices have since fallen and now trade substantially lower and with increased volatility. WTI prices at the beginning of 2019 stood at just under $50 per barrel and consequently, the revenue-generating potential and profitability of upstream assets have been impaired.

Fortunately, ExxonMobil's downstream refineries serve to partially hedge price volatility. While lower oil prices hurt the profitability of upstream assets, they have the potential to buoy refinery profitability. Feedstock becomes cheaper, but the price of refinery output does not necessarily suffer the same decline. Thanks to this effect, integrated oil companies like ExxonMobil have enjoyed far more stable profitability in comparison to pure-play upstream firms.

Reconsidering Downstream

Management has publicly committed to investing in the Upstream division, ExxonMobil's largest business unit both in terms of average revenue and capital deployed. While this gives the company a foothold in attractive plays like the Permian basin and allows it to secure a supply of natural gas for the emerging international trade, performance has floundered. Despite a steady increase in average capital employed, upstream production has remained stagnant and returns have plummeted. While ExxonMobil's upstream segment generated an average annual return of 9.2 per cent over the last five years, the same five-year average figure stood at 43.8 per cent ten years ago.

In contrast, ExxonMobil's downstream segment has yielded an average 19.8-per-cent annual return over the past five years. While management has been increasing capital employed in the Chemical segment, which boasts a comparable average return, average capital used in the downstream industry has remained stagnant; the company has made many Downstream divestments over the past decade. In maintaining the status quo and focusing on the upstream and chemical segments at the expense of downstream operations, management is overlooking potentially lucrative opportunities.

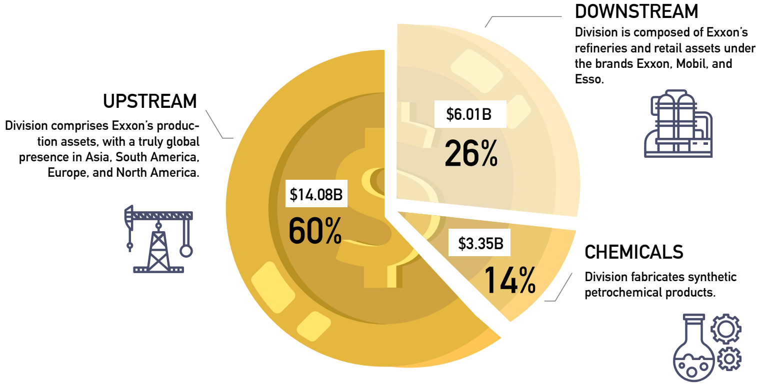
ExxonMobil should instead double down on its downstream success and look to increase capital allocation to business areas focusing on refining and related operations. Given the immense resources and time required to construct a greenfield refinery, ExxonMobil should make full use of its extensive operational experience and look to acquiring ownership in existing businesses. Assets situated in close proximity to existing upstream projects where the company has no existing downstream ownership would provide the additional benefit of helping guard against profitability declines should oil prices drop.

A Developing Opportunity

Natural resource extraction, especially that of energy products, tends to be a complex undertaking. Should the technical capabilities or investment capital be lacking in a developing country, or should an interested domestic agent not exist, the country may be unable to efficiently and economically export its resources to market. To resolve the issue and realize the wealth associated with these resources, governments often turn to private investors as a source of foreign direct investment (FDI).

While foreign assets can carry additional risk, particularly if the country exhibits an unstable political or economic climate, they can sometimes present high-yield investment opportunities. This is especially true of large-scale assets;

2018 NET INCOME BREAKDOWN



Source: ExxonMobil 2018 10-K

because so few players have both the resources and the desire to invest in such projects, attractive returns can often be found for those players willing to take on the risk. Governments of developing nations will often further incentivize FDI through tax benefits or other subsidies.

As a global petroleum supermajor, ExxonMobil is one of the few companies that could effectively invest in developing nations' large-scale petroleum projects. Capitalizing upon opportunities before other players would give ExxonMobil strategic vertical integration that might otherwise be sacrificed to competitors. Furthermore, ExxonMobil already has an upstream presence and experience in many such countries, from which it could draw to assist in the success of this venture. To grow its downstream operations, the company should seek attractive international investment opportunities.

In analyzing downstream opportunities for ExxonMobil, the following six criteria should be of primary concern: local demand, capacity, cost, regulatory environment, proximity to production, and majority ownership. Three specific countries hold the most attractive opportunities.

Ghana

ExxonMobil recently acquired offshore upstream assets in this country and legislation passed in 2016 updated the 1984 Petroleum (Exploration and Production) Act, thereby improving the country's regulatory environment and facilitating resource extraction. Only one refinery currently exists: the government-owned Tema Oil Refinery (TOR), located 29 km east of Ghana's coastal capital, Accra. It has a capacity of 45,000 bbl/d but has had capacity reduced to two-thirds of that following a furnace explosion in January 2017.

In mid-2018, lenders declined to issue loans for crude purchases and since then, the refinery has been substantially idle. Furthermore, TOR is incapable of fully refining oil from Ghana's Jubilee oil field, responsible for the majority of the country's oil production—the refinery was established before this oilfield began producing in 2010 and was designed to process heavier crude blends. As a result of poor management and neglect, TOR owed banks $199 million as of August 2016 and the facility has been earmarked for closure by the energy ministry.

There are two opportunities available here. Firstly, ExxonMobil could invest the capital required to resolve TOR's issues, increase capacity, and delay government closure of this refinery. This decision would expand refining capabilities to encompass lighter oil and would require an investment of approximately $1.2 billion. Alternatively, the government is seeking an investor to develop a new $3.5 billion, 150,000 bbl/d facility meant to replace TOR; ExxonMobil could partner with the Ghanaian government to develop the new refinery, giving the company the opportunity to implement industry best practices from the ground-up.

ASSET SELECTION CRITERIA

LOCAL DEMAND	CAPACITY	COST	REGULATORY ENVIRONMENT	PROXIMITY TO PRODUCTION	MAJORITY OWNERSHIP
Projects pursued should have sufficient demand in the local region for petroleum end-products.	Projected refining capacity should be at least 60,000 bbl/d, the capacity equivalent to that of ExxonMobil's smallest refinery.	While downstream assets are inherently capital-intensive, ExxonMobil should not compromise profitability for growth.	Government policy in the selected jurisdiction should be well-defined, stable, and conducive to FDI. Expropriation risk should be virtually nonexistent.	Close proximity to ExxonMobil-owned production projects would result in guaranteed refinery supply and reduced feedstock transportation costs.	The opportunity for majority asset ownership is preferred. Such a structure would lead to simplified governance.

LOCATION OPTION COMPARISON

	GHANA	NIGERIA	BRAZIL
CAPACITY (bbl/d)	150,000	100,000	409,000
COST ($)	3.5B	1.5B	1.5B
GOVERNMENT INVOLVEMENT	High	Low	Medium
COUNTRY RISK	Medium-High	Medium-High	Medium

Source: IBR Analysis

Nigeria

With a maximum crude oil production of 2.5 million bbl/d, Nigeria is the largest oil-producing nation in Africa. The country has four refineries with a combined capacity of 445,000 bbl/d, but years of neglect have left them broken down, producing at less than 15 per cent of their capacity as of October 2018. To supplement this shortfall, Nigeria had to import $6.3 billion in refined petroleum products in 2017.

In response to the capacity shortfall, construction has begun on the massive 650,000 bbl/d Dangote refinery, expected to be operational by 2022. Smaller, modular refineries are also being developed, some with capacity as small as 1,000 bbl/d, but in aggregate, expected to add 700,000 bbl/d of capacity. As of October 2018, 40 modular refinery projects were registered, with 10 in the advanced stages of construction and expected to be in operation as early as mid to late 2019.

In Nigeria, ExxonMobil has two options: buy into the concessions of the four larger, older refineries, or build a network of three to four modular refineries with capacities around 25,000 bbl/d.

Brazil

Brazil's massive deepwater reserves and inland basins have paved its path to becoming a major oil producer. Historically, Brazil's nationalized petroleum company, Petrobras, has dominated production. However, recent financial distress has sparked a desire to privatize assets: the company plans to raise $26.9 billion through asset sales and partnerships by 2023. ExxonMobil has already taken advantage of this opportunity, having secured drilling rights in the Santos and Campos basins.

Petrobras has also turned to divesting downstream assets: four refineries are being sold in two packages, one containing two northeastern refineries and the other containing two southern refineries. Each refinery package also contains storage and midstream capacity. Under the terms of the sale, the purchaser will acquire a 60-per-cent stake in the refinery assets.

The northeastern package contains Abreu e Lima and Landulpho Alves, with respective capacities of 115,000 bbl/d and 323,000 bbl/d. Approximately 70 per cent of production at Abreu e Lima is diesel fuel and construction on a second 115,000 bbl/d train is underway. The southern package contains Alberto Pasqualini and Presidente Vargas, with respective capacities of 201,000 bbl/d and 208,000 bbl/d. The two refineries serve demand in the local market, with more than 85 per cent of Presidente Vargas' production supplied to the surrounding area.

Recommendation

The option that best aligns with the prescribed criteria is the investment in the southern Brazilian assets, Alberto Pasqualini and Presidente Vargas, given ExxonMobil's established presence in the country, the availability of well-located assets, and the potential for ExxonMobil to capitalize on local demand for heavy crude refining capacity. This southern asset package includes 736 kilometers of pipeline and seven storage terminals capable of holding 6.1 million barrels of crude and 3.3 million barrels of refined products. Because ExxonMobil additionally has a Chemical operations presence in Brazil, there is opportunity for greater vertical integration in the future.

While Ghana's lack of refinery competition presents an attractive landscape, its TOR refinery and greenfield expansion both require government partnerships, introducing significant political risk. Majority ownership of the assets would furthermore be difficult to achieve, with a proposed PetroSaudi International partnership in 2015 leading to rumours of a total sell-off of TOR in 2015; the refinery ultimately withdrew its partnership offer.

Nigeria, on the other hand, lacks sufficient infrastructure to handle mega-projects like the Dangote refinery, while the small modular refineries are set to be awash in supply. Once Dangote comes online, the smaller refineries will furthermore lose competitiveness as Dangote reaches economies of scale. The chances of succeeding in the acquisition are also uncertain; in 2017, the Nigerian Senate voted to cancel a refinery contract with Italian firm Eni, preventing the global player from repairing and operating a 210,000 bbl/d facility.

Financially, this Brazilian acquisition is most reasonable. The refineries produce mainly gasoline and diesel fuel and have a combined feedstock throughput of more than 400,000 bbl/d. Assuming a typical yield of refined products and given Brazil's recent diesel price of approximately $3.40 per gallon and its gasoline price of just over $4.00, each barrel of crude has a realizable value of $120 based on these two products alone. ExxonMobil can use its experience in refinery operations to keep operating costs low, ensuring healthy margins and sufficient buffer in the event of crude price spikes.

In 2010, Petrobras paid a net $350 million to increase its stake in the Alberto Pasqualini refinery by 30 per cent, implying a price of $17 per annual barrel produced. Assuming that ExxonMobil would purchase the assets at a similar price, the company would need to invest $1.5 billion to obtain 60-per-cent ownership in the refineries. ExxonMobil would furthermore need to account for the value of the pipeline and storage network, with the company's bid partially dependent upon the benefits it would realize from the vertical integration that such asset ownership would bring.

Refining a Strategy

A key factor driving the recommendation is the significant local demand for refined petroleum products in the Brazilian market. Current Brazilian refining capacity of 2.3 million bbl/d stands in stark disparity to local demand of 3 million bbl/d, and without additional investment to expand refining capacity, the supply-demand imbalance will persist. The issue is exacerbated by Brazil's difficulty refining heavier crudes, as its refineries have historically processed lighter grades. This provides ExxonMobil an opportunity to monopolize this market by retooling its acquisitions. At 60-per-cent ownership in these two assets, ExxonMobil will own 11 per cent of Brazil's refining capacity and will have a strong foothold for further growth in the country.

Key drivers of refineries' competitive advantage are operational efficiency and location. Through this acquisition, ExxonMobil is in a position to vertically integrate and generate operational efficiencies through guaranteed feedstock from its producing assets. Furthermore, the joint acquisition of the crude pipeline network will service demand across Brazil without the need to enter costly fee-based contracts with a midstream operator, decreasing per-barrel transport costs and increasing profitability. The terminals allow ExxonMobil to remain agile in the face of volatility and easily export refined petroleum products to international markets in the unlikely event of a drop in Brazilian demand. The refineries furthermore expand ExxonMobil's downstream capacity by five per cent, significantly expanding the size of the business. Petrobras's intent to divest 60 per cent of these assets aligns with the aforementioned criteria of majority ownership, allowing ExxonMobil to retain control over its assets.

After purchasing the Brazilian assets, ExxonMobil must integrate the refineries into its current operations and draw on its expertise to optimize performance. ExxonMobil should then look to retool the facility to refine heavier types of oil, specifically crudes with American Petroleum Institute gravity of less than 16.

Pipeline to Progress

Given the scale of this recommendation, a number of risks must be addressed. The sheer size of the proposed acquisition may prove too large for ExxonMobil to successfully integrate into its portfolio. However, the company does have success at managing large-scale assets: its wholly-owned Baytown and Jurong downstream assets have refining capacities of 561,000 bbl/d and 592,000 bbl/d, respectively.

Brazil has a substantial amount of debt: at $1.4 trillion, this represents nearly 70 per cent of its 2017 GDP. The country has an undesirable S&P credit rating of BB- and despite the rating outlook having been stable since January 2018, the debt load presents a real risk. To mitigate against potential currency depreciation, ExxonMobil should consider long-term currency hedging to fix the value of its production in U.S. dollars.

ExxonMobil's success to date has largely been due to its position as a sizeable, integrated player in the oil and gas industry. In a time of energy privatization, by pursuing this asset acquisition in southern Brazil, ExxonMobil will be able to build out its refining business in a country where it can further solidify its position as a dominant player.

SOUTHERN COMPANY: IN THE BLINK OF AN EYE

Electric vehicle charging infrastructure can form an ancillary revenue stream for this vertically-integrated utility company

Leo Hong and Melissa Shang

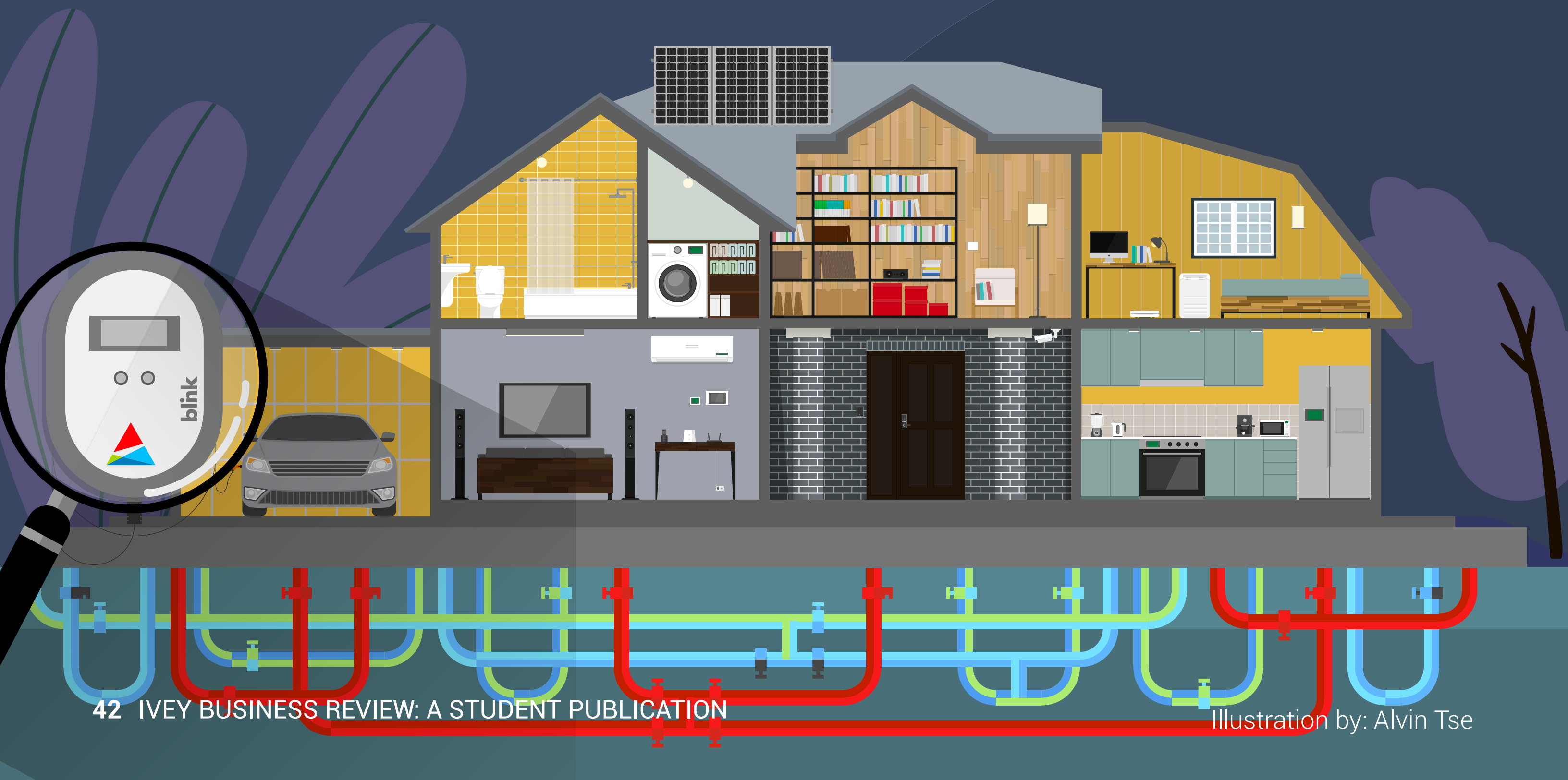


Illustration by: Alvin Tse

A Power Empire

When James Mitchell took over as President at Alabama Power more than a century ago, he had a vision to power America's southeast with the hydro potential of Alabama's rivers. After years of restructures, mergers, and dissolutions, Alabama Power is held by what is known today as The Southern Company (Southern). Since James Mitchell's founding dream, Southern has built itself upon what it proudly describes as "big bets."

Today, Southern is the second-largest utility company in the U.S. by customer base and a leading provider of U.S. electricity and natural gas. Through its subsidiaries, including Alabama Power, Georgia Power, and Mississippi Power, Southern owns and operates 125 power generation facilities in the Southeastern U.S., providing 43.5 gigawatts of generating capacity.

Big Bets or Bad Bets?

In 2016, Southern paid approximately $8.0 billion to acquire AGL Resources, a natural gas provider to more than 4.5 million customers in seven states. Post-merger, AGL Resources was renamed Southern Company Gas and the merger served as an accelerated expansion into the distribution of natural gas. Southern described the resulting combination of the two companies as being "well-positioned to compete for growth across the energy value chain."

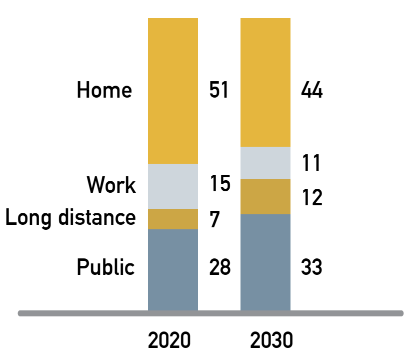
While the AGL transaction did add $3.9 billion in annual revenue to Southern's top line, the company's financial strength suffered. The 2016 issuance of $16.4 billion in long-term debt represented a near doubling of the $24.7 billion held at the end of 2015. As a result of this increased leverage, the company's interest coverage fell from 5.1 in 2015 to 2.3 in 2018.

From 2016 to 2017, net income dropped from $2.45 billion to $842 million, caused by a number of poor investments and grid defection. In Kempur, Mississippi, the company's attempts to build the CEO-acclaimed "world's cleanest coal plant" exceeded the initial $2.3-billion budget by $5.2 billion. After writing off a reported $6.4 billion in losses, Southern decided to cancel the proof-of-concept project in 2017, reverting the clean-coal plant back to natural gas. Another attempt to expand the company's joint-venture Plant Vogtle nuclear power station also saw expenses balloon from an initial estimate of $14.3 billion to more than $25 billion.

While these ambitious bets were made with the intention of helping Southern achieve aggressive growth, failed projects have hindered that goal while simultaneously causing a massive accumulation of debt. Despite Southern's net income rebounding to $2.2 billion in 2018, the company's financial position has struggled. In looking to manage its debt, the company has turned to the sale of core assets.

U.S. EV ENERGY DEMAND (%)

PUBLIC-CENTRED SCENARIO



Source: McKinsey & Company

Current Efforts to Reduce Debt

In 2018, Southern announced its decision to sell its Florida utility subsidiary, Gulf Power, and related assets to NextEra Energy, owner of Florida Power & Light Company. While the $6.5-billion deal relieved Southern of $1.4 billion of debt, it resulted in the company's near-complete exit from the Florida market and the loss of more than $1.2 billion in annual revenue. The company was also forced to sell one third of its solar portfolio for $1.2 billion, one of Southern's few profit-generating centres.

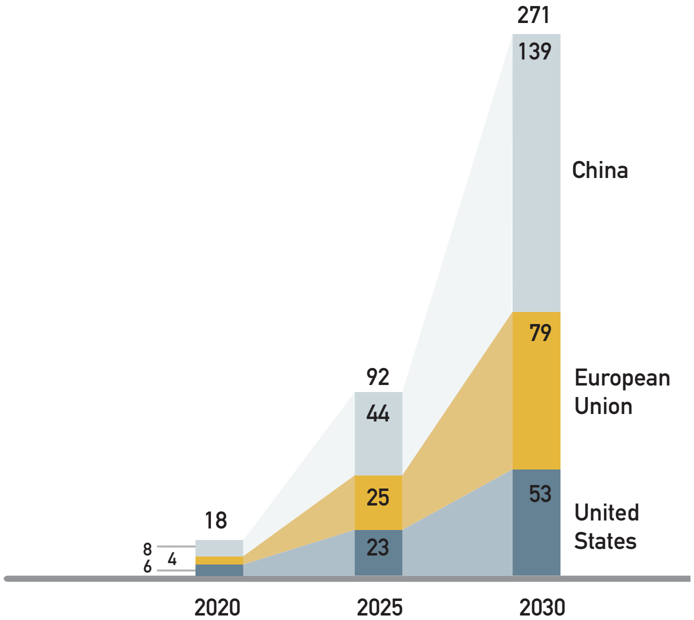
For Southern, continued asset sales will precipitate a disastrous cycle for investors. They will result in temporary debt relief, but at the cost of the business' long-term prospects. The ability to use cash flow from operations to pay down debt is furthermore limited; approximately 35 per cent of this stream is directly diverted to common shareholder dividends and the remainder is channelled into fixed asset investments. With $29.0 billion in debt principal maturing after 2023 and $25.8 billion of interest payments due over the same time period, Southern must find a solution to manage its debt once it comes due.

A Venture Into EV Charging Stations

A timely opportunity exists for the company to capitalize on a growing and related industry. Electric vehicles (EVs) have experienced tremendous adoption in recent years. As of 2017, EVs—including plug-in hybrid, battery, and hybrid electric—accounted for more than three per cent of global auto sales. As affordability, efficiency, and range capabilities of EVs improve, this figure is expected to swell to 30 per cent by 2025. Global electric vehicle sales reached 1.2 million in 2017, exhibiting a compound annual growth rate of 50 per cent over the preceding five years.

Compared to the average new gasoline vehicle, EVs emit half the carbon dioxide emissions per mile based on U.S. EPA national electricity generation data. In an effort to promote environmentally-friendly behavior, governments

TOTAL ENERGY DEMAND (BILLION KWH)



Source: McKinsey & Company

have been introducing legislation to facilitate the adoption of these vehicles. In the U.S., these initiatives have begun at the state level; a California-led coalition of states has introduced the Zero-Emission Vehicle Standards, which requires automakers to sell a quota of zero-emission vehicles proportional to overall sales.

Public Utility Moves into EV

The emergence of EVs as a viable and attractive substitute to traditional internal combustion engine vehicles has major implications for public utility companies. Energy used for transportation—historically provided through gasoline, diesel, and other fuels—is now increasingly drawn from the electricity grid. Utilities must consider how to plan for the increased power usage, shifts in when this power is drawn, and infrastructure required to support electric vehicle charging.

In certain U.S. markets, wholesale power distribution is facilitated through regional independent system operators (ISOs), federally-regulated entities responsible for control and coordination of power distribution. In others, power can be sold directly to consumers and as a result, utilities tend to be vertically integrated. Where vertical integration is possible, EV infrastructure is a natural adjacency for electric utility companies.

Some American utility companies have begun to approach EV infrastructure. Early stage adopters have installed EV charging infrastructure like workplace charging for utility fleets and access to charging stations at office locations as a pilot test. Other utility companies have moved into EV charger sales: San Diego Gas & Electric, for example, sells EV chargers directly to consumers.

Similarly, Southern can share in the EV industry's growth by entering the public EV charging space. The company's southeast markets allow for vertical integration, aligning with the core power business, and the immense growth this industry exhibits implies a reliable, recurring stream of cash to pay down debt when Southern's substantial borrowings ultimately mature.

The Blink Opportunity

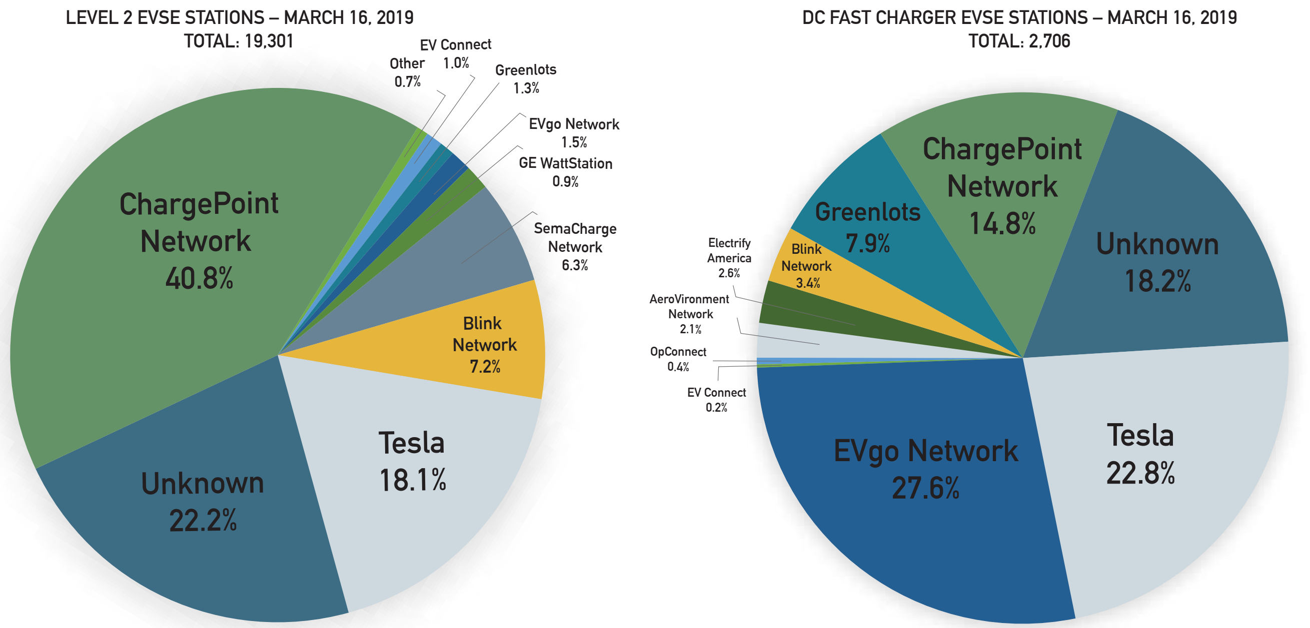
Given that many charging stations use proprietary technology, it is preferable to buy, rather than build, an infrastructure network. Southern would benefit from proven technology that it could scale quickly. The U.S. is currently dominated by four networks that own 60 per cent of the total 21,000 public charging stations: ChargePoint, Tesla, Blink Charging (Blink), and SemaConnect. This includes both Level 2 AC and DC charging stations. AC chargers are cheaper to build, requiring similar electrical requirements as common household appliances. In contrast, DC chargers deliver the fastest charging speed available but due to their high implementation costs, are less feasible for residential ownership. Blink, which operates 7.2 per cent of the Level 2 AC chargers and 3.4 per cent of the DC fast chargers, is the largest network for which an acquisition would be feasible.

ChargePoint, the industry leader, recently raised $240 million of series H funding and so would not require financial backing. The Tesla network, on the other hand, is owned and operated exclusively by the EV manufacturer for its ecosystem. Lastly, SemaConnect lacks a presence in DC fast charging, which has the highest projected demand of all charging stations. Other potential acquisition targets such as Greenlots and EVgo—although dominant in the DC fast charging space—lack substantial size, each with less than 1,000 stations in the U.S.

Blink owns and operates charging equipment, and manages installation, maintenance, and related services. The company has built its business model on revenue sharing agreements with apartment, retail, and workplace properties partners; the company has been immensely successful in building stations in urban centres, establishing high-profile partnerships with companies such as Whole Foods Market and Hubject, a joint venture between companies including Siemens, BMW, Volkswagen, and Daimler.

From Southern's perspective, Blink's valuation makes it an attractive acquisition target. As of mid-March 2019, the company had an equity value of approximately $70 million and controlled approximately 7.2 per cent of the nation's Level 2 AC charging infrastructure. This acquisition would provide Southern with substantial growth potential without exacerbating the company's already pressing debt load.

EVSE KEY MARKET PLAYERS



Source: U.S. Department of Energy

Impact on Southern

The immediate benefits of the Blink acquisition would be relatively small. Because the EV industry is in its infancy, Blink will initially contribute a mere \$2.5 million to Southern's annual revenues, a negligible amount compared to the \$23 billion currently generated. While not immediately material, the acquisition holds great potential for growth. With an anticipated 47.9 million EVs on U.S. roads by 2025, if Blink were to retain its current market share of 7.2 per cent, Southern would realize incremental revenues of just under \$1.0 billion from this transaction alone.

Blink would also add value to Southern through the benefit it brings to Southern's power generation assets. Given that current EV batteries have capacities of up to 100 kWh, the electricity required to fully charge most EVs exceeds the average daily consumption of the typical American household. This acquisition would provide Southern with granular data on this electricity demand, which could be used to optimize the company's assets.

With this data, Southern could better predict future electricity demand and decide when to bring its plants online so as to maximize profitability. In addition, Southern could influence EV charging behavior by modifying Blink's charging price based upon the time of day, incentivizing electric vehicle owners to draw on power during non-peak hours. As a vertically-integrated power producer, Southern's ability to directly provide electricity to end users positions the company to particularly benefit from this information.

The acquisition furthermore aligns well with Southern's strategy: in 2016, the company acquired PowerSecure, a provider of energy infrastructure products. Such technologies are aimed at utility companies and help balance load through energy storage, solar energy, and microgrid solutions. The Blink acquisition can be used to better understand EV charging demand and influence consumer behavior, enhancing the impact of such technologies.

Electric Roads Ahead

Building out EV infrastructure is a capital-intensive endeavour and could prove challenging given Southern's already stressed financial position. However, Blink's strategy to date has focused on giving partners the option to share in the EV charging infrastructure and installation expense. Additional expansion would, therefore, be less capital-intensive than if Blink were to have complete ownership in the infrastructure. This partnership nature furthermore benefits Southern as in its key geographies, the company obtains more data on electricity use for each dollar spent building out EV charging infrastructure.

Southern's big bet on AGL Resources may have been a smart business decision, but it incurred mountains of debt. Southern's current strategy of selling off major assets is unsustainable; the company must turn to other tactics to address its debt. The proposed acquisition plan will allow Southern to develop an ancillary revenue stream in time to pay off its debt when it eventually matures while entrenching the firm's vertical integration and enhancing its core power business.

FINANCE

WEALTHSIMPLE: **EAST MEETS WEST**

Amidst rising competition in current markets, expanding to India may provide a new growth engine for Wealthsimple

Nameh Dhawan and Ryan Li

Illustration by: Matthew Tai

Simplifying Wealth

With more than C$3 billion in assets under management (AUM) and 100,000 clients, Wealthsimple is a leading player in the robo-advisory industry. The firm offers individuals passive wealth management services in the U.S., the U.K., and Canada.

Passively investing through an index fund is hardly a new innovation, tracing back to 1976 when John Bogle opened the first fund at Vanguard. The most recent wave of this trend began in 2008 in the U.S. with robo-advisory firms like Betterment and Wealthfront, who have since accumulated approximately $14 billion and $11 billion in AUM, respectively.

While the advantages of passive investing are well-documented, incumbents are being forced to expand their current product offerings in a bid to capture and retain clients. Wealthfront, for example, now offers a line of credit alongside its robo-advisory services. While the robo-advisory business may not yet be saturated, this trend implies that incumbents are facing difficulty in convincing consumers to adopt their products. The result is a much smaller obtainable market for robo-advisory relative to the total addressable market for asset management services. In such market conditions, incumbents can only attempt to differentiate what is a largely generic product—passive investing at low fees—with customer experience, branding, and a reliance on consumer loyalty.

To date, Wealthsimple has introduced a number of product expansions to accomplish just that. Wealthsimple has followed U.S. incumbents' decisions to introduce ancillary products such as savings accounts. These tools were presumably created to introduce the company to customers in hopes of building a relationship that could lead to cross-selling its investment service. In addition, Wealthsimple has proactively created new investment products to appeal to market niches with its Halal and Socially Responsible investment portfolios. It has also attempted to reduce traditional frictions in investing by automating the processes of investing consumers' spare change (Roundup) and surplus bank balances (Overflow), features which better enable consumers to save. Lastly, the company has expanded to international markets to fuel faster growth, launching a U.S. expansion in January 2017 and entering the U.K. later that same year.

While these initiatives have increased the platform's accessibility and functionality, these different expansion vectors by Wealthsimple raise the question: why is Wealthsimple not instead focusing on increasing its penetration in the company's existing markets?

Is the Piggy Bank Full?

Wealthsimple has hardly dented the overall $37-trillion North American asset management market, managing more than C$3 billion in total assets. Many consumers have an aversion to robo-advisory services and within the part of the market comfortable with the idea of a robo-advisor, competition is fierce due to the presence of incumbent robo-advisors and banks.

Another factor limiting the size of Wealthsimple's target market is a misalignment between clients inquiring about the company's products and the clients' investment requirements. As Wealthsimple's communications director Rachael Factor stated, the robo-advisory service is sometimes not appropriate for would-be clients given their time horizon and the nature of the investment. With competitive incumbents in new markets and difficulties in consumer willingness to adopt Wealthsimple's products, the future of Wealthsimple's growth is in flux.

The Growth Question

By considering the following combination of events, a new narrative around Wealthsimple's dissatisfactory growth is constructed:

1) Wealthsimple conducted its expansion into the U.K. very soon after the U.S., certainly before a full penetration of the U.S. would have been possible. This is particularly illustrative of the poor market conditions given that Wealthsimple's larger U.S. peers have not opted to look at other geographies.

2) Wealthsimple has suffered from an inability to directly apply its strategies from Canada to the U.S. because of differing market dynamics. In the U.S., the headwind of heavy student loans has made investing less feasible for individuals under the age of 35. In response, Wealthsimple has shifted its focus towards an older demographic.

3) Wealthsimple has been consistent in its expansion into niche products. The company first introduced Socially Responsible Investing in May 2016. Just over one year later, Halal Investing was introduced in a continuous attempt to appeal to specific consumer preferences.

The company's continuous efforts to grow its addressable market and the magnitude of the obstacles that have arisen in each market have made it clear that current growth initiatives are insufficient.

FINANCIAL PRODUCTS IN INDIA

Wealthsimple's Options

Wealthsimple has several options to ensure its business grows into the future. The first is continuing with its current strategy, building out alternative channels like Wealthsimple for Advisors and expanding the offered services to capture a larger portion of financial advisors' back-end expenses. The risks with this option are largely structural: the incumbent banks offer similar products and mandate affiliated advisors to use their offerings.

Wealthsimple could also choose to actively invest in consumer awareness and marketing of the benefits to passive investing in an effort to promote Wealthsimple's products. This option carries the same risk wherein newly informed individuals may still opt for a more established brand such as the "Big Five" Canadian banks, which are entering this market and have the benefit of significant public trust.

The last option is to expand its services to a new geography that is currently not served or underserved by robo-advisors. This option carries the risk that Wealthsimple could overextend its resources trying to expand the business globally while attempting to maintain its focus on its core market. However, in markets where robo-advisory is still a nascent industry, this approach allows for efficient growth due to low competition. If combined with the right demographics, it could enable Wealthsimple to scale its business and capture untapped "blue ocean" markets.

Provided appropriate execution, the third option provides Wealthsimple the highest measure of control over its fortune in an industry so reliant on consumer perception and with large incumbents competing at every turn. Of all international markets, the ideal opportunity for expansion can be found in India.

The Indian Robo-Advisory Opportunity

The market opportunity for robo-advisory in India is significant due to four major themes:

- A culture of savings is entrenched among Indians. While private savings are significant, historically accounting for 30 per cent of GDP, they have historically been in illiquid or unproductive assets including real estate and gold, limiting the exposure of Indian households to asset classes like the equity markets. This trend has slowly started to shift since 2016 as a result of demonetisation, the Indian government's decision to invalidate all 500 and 1,000 rupee notes in an attempt to dramatically suppress illicit and counterfeit cash in the economy. With increased trust in the financial systems, Indian households responded by channeling their unproductive assets into formal saving mechanisms such as mutual funds.
- Demonetisation was a key catalyst leading to an increase in trust in technology-based processes for finance among Indians. This led to a massive shift towards cashless transactions like credit/debit and an expansion of the formal economy. This has also been the impetus for some individuals to skip directly to digital financial services, leapfrogging traditional services like physical credit cards.
- There is a confluence of demographic trends that gives India a large base of individuals with investable assets—a key tailwind for robo-advisors. India is projected to have the largest middle class in the world by 2027 and its number of high disposable income households has increased twentyfold since 1990.

INDIAN EXPANSION TARGET CITIES

- This industry now enjoys broad regulatory support. The Securities and Exchange Board of India clarified in 2016 that an advisory service using automated tools is perfectly acceptable provided the service follow compliance rules and conduct client risk profiling, key capabilities that Wealthsimple already possesses. Additionally, a foreign asset manager can enter the market and invest in Indian securities provided they do not repatriate shares. Repatriation of shares would not present any issue as Wealthsimple would not remove funds invested for Indian clients from India.

Opportunity for Wealthsimple

Given pressures from incumbents like Wealthfront in the U.S. and new entrants like the Canadian banks, Wealthsimple would be well-served to seize a compelling blue ocean opportunity like the one that India offers. Secular trends demonstrate that the Indian market is ready for a robo-advisors with a large untapped obtainable market, unlike Western economies where the immediately obtainable market has already been saturated. This is particularly enhanced by the lack of a pure-play competitor in the Indian market.

Client Fit

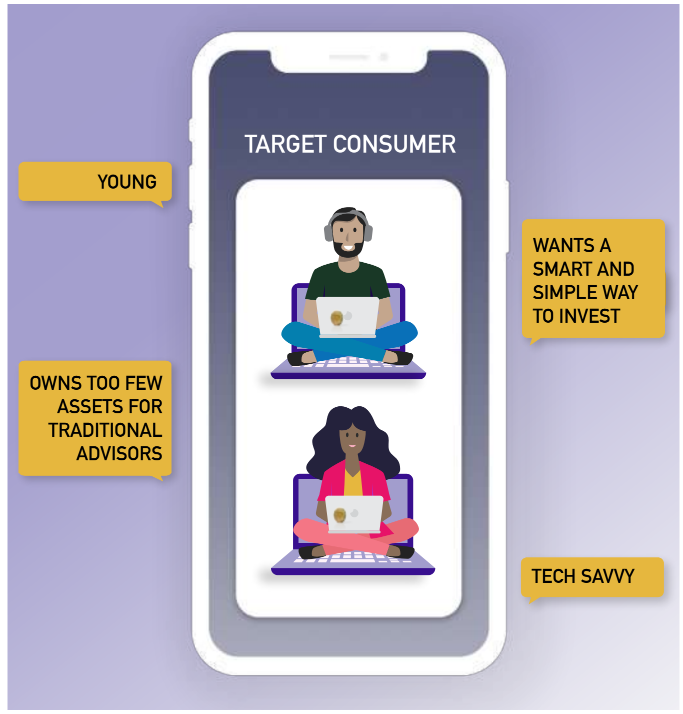
Wealthsimple's target clients want "a smarter and simpler way to invest their savings" and "don't have the required assets to hire traditional advisors." India represents a relatively unsophisticated market with respect to financial literacy. The current breadth of investment products offered to the average Indian is overwhelming. Products like Systematic Investment Plans, mutual funds, Public Provident Funds, Reserve Bank of India taxable bonds, and Equity-Linked Savings Schemes are difficult for the layperson to analyze to determine the ideal portfolio for their needs. Wealthsimple's value proposition would be to provide greater accessibility to a larger set of the population than the existing convoluted schemes. Wealthsimple also has an advantage over these products in that its focus on mobile investing is particularly targeted towards millennials and other individuals with a high degree of tech savviness.

Picking the Right India

While India is one country, it is a bastion of diversity with 22 officially recognized languages and six unique regions. Executing in this market requires a carefully considered strategy that accounts for regional and linguistic norms.

Some best practices with respect to Indian expansion include the ability to localize the business and offer products with decreased functionality and technical requirements. A "Wealthsimple Lite" would mirror big tech peers' product introductions such as Uber Lite and would

WEALTHSIMPLE TARGET CONSUMER



better match technical limitations in India. This version should focus on the core product and progressively roll out new features as the company gains traction; features like Roundup or Overflow would likely overwhelm the uninitiated consumer.

A targeted launch in a few major Indian metropolitan areas that have some regional similarities would enable Wealthsimple to gain traction while minimizing its execution risk by limiting the likelihood of cultural missteps. A possible set of cities includes Mumbai, Hyderabad, Chennai, and Pune; all are large cities with sizeable English-speaking populations and of relative affluence in India.

Going for Gold

With no clear option to spur growth for Wealthsimple given its existing operations and the ripening of India as a market ready for robo-advisory services, Wealthsimple should aggressively position itself to capture the lion's share of the market. With a recognizable brand, positive customer associations, and an easy-to-use platform, Wealthsimple would be a welcome addition to the Indian wealth management landscape.

If Wealthsimple does not seize this opportunity, any future expansion plans will repeat its experience in the U.S., where a local incumbent has gained too much market awareness to topple. There may never be a profitable second place, so Wealthsimple must actively go for gold.

AMAZON: **PRIME TIME FOR HEALTHCARE**

Amazon can provide a holistic healthcare ecosystem with the introduction of health insurance

Amy Li and Arshdeep Toor

Illustration by: Ria Iyer

Amazon's Current Healthcare Strategy

Amazon has dominated digital business, which touches almost every industry; the company is currently well positioned to lateral into any other segment where it can add value. Amazon's interest in healthcare is fuelled by three factors: the industry is large and growing, the segment is characterized by waste and inefficiency, and consumer expectations are forcing incumbents towards being more responsive and consumer-focused. In the U.S., healthcare is not universally accessible and its fragmentation makes seeking treatment a frustrating experience for consumers. Amazon has identified this industry as an area where its expertise in transforming traditional business models through technology can prove useful in achieving market success.

The company has begun to move into healthcare but has yet to aggressively pursue growth. To date, it has made several investments and has formed Haven, a nonprofit joint venture with JPMorgan Chase and Berkshire Hathaway. Haven's stated goal is to improve the overall healthcare system, focusing first on U.S.-based employees of the three companies. Rather than scaling this company to compete with insurance existing providers in America, Amazon should purpose it as a proof-of-concept for its health products and services.

Chaos in the American Healthcare System

The U.S. healthcare industry is extremely inefficient; hospitals, clinics, and insurance companies operate independently from one another, leading to high administrative costs and a lack of data sharing. Insurance coverage of prescription drugs, for example, often requires lengthy pre-authorization and reimbursement procedures. Time is wasted on billing and processing insurance claims as private insurance plans can have vastly different terms and conditions. Patients are sometimes required to pay out of pocket if the procedure does not meet coverage terms.

Historically, healthcare coverage in the U.S. has been provided through a combination of private health insurance and public health coverage. Both sides have different incentives and balancing these interests has left consumers trapped in an overly complex healthcare system. Patients are frustrated with the poor service and lack of price transparency. A 2017 CVS Health survey found that most Americans believe the current health system works only somewhat well or not at all well; of those who believe that the system does not work well, 65 per cent believe that it is too expensive.

The industry seems primed for disruption and Amazon is uniquely positioned to enter this space. By introducing a package of products and services that would reduce the operating cost of health insurance providers and in turn, the premiums paid by consumers, Amazon could establish itself as a behemoth in yet another industry.

Amazon's Insurance Play

Haven, Amazon's joint venture, should enable new innovations in healthcare using JPMorgan's financing expertise, Berkshire's insurance experience, and Amazon's technological capabilities. Although the venture represents a step in the right direction, it would still take Amazon too long to realize the benefits of scale. Within healthcare, Amazon is better positioned as a facilitator of health services in its mission to dominate the space. However, the benefits extend beyond the potential profit from dominating the space. By facilitating health care, Amazon will be able to add more Prime customers, who spend almost three times as much every year as their non-Prime counterparts. Since 2011, Amazon has been adding more services such as music and video streaming to incentivize people to join this program, even if it means less profit in the short run.

Amazon's approach should be to build and sell a healthcare ecosystem, which will be referred to as "Prime Health." Prime Health would be a package of products and services for personal healthcare, such as an Alexa-enabled device that creates an online user profile with medical history. Insurance companies would attach this online profile to an individual's plan, allowing the companies to collect more consumer data and gain deeper insights into the individual's health. Amazon entered the cloud computing market under Amazon Web Services (AWS) by charging enterprises a fee for its service—Prime Health can be to healthcare what AWS was to cloud computing.

Haven would be an incubator for the Prime Health package where all of Berkshire's investments in insurance would utilize the ecosystem. Once proof-of-concept is established, Amazon could scale Prime Health outside of the nonprofit company. Since the size of America's health insurance industry is directly linked to that of the American population, customers lost by one provider can be gained by another competitor. Eventually, most, if not all, insurance companies in the U.S. would be inclined to incorporate Prime Health into their operations to remain competitive on price. The total market size for U.S. healthcare is projected to be approximately $6.0 trillion by 2027, outpacing GDP growth over this period. By partnering with insurance companies, Amazon would solve the need for a coordinated and organized solution, as Prime Health would help address inconveniences in the value chain.

A successful insurance provider collects more in premiums than it pays out in claims. Existing providers are focused on targeting revenues by growing customers or increasing premiums. Amazon could act on the cost side of the equation by using Prime Health to help insurance companies reduce the frequency and size of claims paid out.

The Amazon Advantage

Existing incumbents in the health insurance industry generally service consumers by providing financial assurance in three healthcare areas: ailment diagnosis, healthcare issuance, and extended care facilitation. Ailment diagnosis includes doctor visits, healthcare issuance includes drug dispensation, and extended care includes hospital stays.

Major pain points for insurance players include customer frustration arising from the industry's complexity, difficulty in preventing consumer health issues resulting in high payouts, and the high cost of care in America. To alleviate these pain points, Amazon should introduce Prime Health as an ecosystem that collects and analyzes user data to provide insurance incumbents with new predictive measures for consumer health, increased accuracy of consumer health profiles, and reduced health care administrative costs. This can be done through Amazon's consumer-facing interfaces, data storage and analytics capabilities, and distribution channels.

AMAZON MEDICAL ECOSYSTEM

Preventative Measures to Healthcare

To make a profit, insurance companies charge high enough risk premiums to all consumers in order to distribute risk as insulation from financial loss. However, they are unable to materially influence consumer behaviour and control health risks to lower payouts. Preventative medicine is not in the insurance company's toolbox, but it is a key capability that Amazon can offer.

To increase preventative measures for sustaining consumer health, Amazon can capitalize on the over 100 million Alexa-enabled devices sold as well as Americans' openness to using smart home devices. Amazon has already filed for a patent on software enabling Alexa to analyze a user's voice to determine physical and emotional condition; the company is primed to use this technology to personalize healthcare recommendations for each individual end consumer.

As part of Prime Health, insurance companies would provide their clients with an Alexa-enabled device. Amazon could then use Alexa's reach and healthcare analysis technology to catch illnesses early and recommend doctor check-ups or over-the-counter (OTC) drugs to prevent the escalation of ailments and their respective insurance payouts. Alexa could also recommend healthier food options and exercise regimens by analyzing search history data and health data from external Alexa skills (add-on capabilities). By taking a proactive approach to consumer health and personalizing preventative measures for each consumer, Amazon will be able to catch potential major illnesses earlier, when treatment costs less, and prevent some illnesses from occurring altogether.

Using Data to Enhance Insurance

Amazon excels in both data collection and data analysis. Through these competencies, Amazon can bolster current risk modelling capabilities of health insurance players. This will, in turn, result in a more accurate calculation of premiums, leading to an overall lowering of costs for end consumers.

Real-time consumer data such as user behavior, purchasing patterns, and exercise habits are constantly being collected by Alexa. Additionally, data collected through the insurance application and submission process such as claims history, doctor's notes, and patient records will provide additional sources of information about a consumer's life.

Amazon should feed these data points into its proprietary analytics software, Comprehend Medical, to provide insurers with tangible insights. Comprehend Medical is a natural language processing service that uses machine learning to extract relevant information from unstructured

TARGET CUSTOMER

text. Comprehend has recently become Health Insurance Portability and Accountability Act eligible, which enables the use and storage of protected health information (PHI) such as name, age, and medical record number. Feeding real-time data sources to Comprehend combined with Amazon's data analysis capabilities allows the company to build an accurate and comprehensive health profile for insurance companies that enables personalized preventative medical and wellness recommendations.

Unparalleled Distribution, Unbeatable Convenience

To further increase consumer convenience and reduce health care administrative costs, Amazon should incorporate its existing abilities to distribute both over-the-counter and prescription drugs. Its Basic Care line provides OTC drugs through the Amazon Marketplace, with product offerings that are approximately 20 per cent cheaper than retail pharmacies. Amazon also owns PillPack, a full-service online pharmacy that mails prescription drugs.

By capitalizing on PillPack and Marketplace's existing delivery infrastructure, Amazon can help insurance companies deliver low-cost OTC and prescription drugs to consumers within one to two days. This existing distribution system is more convenient for Prime Health customers than traditional insurance processes and would offer a competitive price.

A Day in the Life

Meet David, a customer of a healthcare insurance company who has partnered with Prime Health. David uses Alexa through the Echo Dot, which was mailed to him as part of his insurance package, on a daily basis to complete mundane tasks. On the back-end, Alexa is slowly building out a health profile on David, based on his voice tone, day-to-day searches and purchasing habits.

David asks Alexa to set an 8:00 a.m. alarm for the next day. Alexa processes David's communication and follows up with a comment about how raspy David's voice sounds, prompting David to tell her how he's feeling. Alexa decides that David seems to have caught a cold and asks David if he would like to book a consultation with an online healthcare professional. David complies, and books an afternoon consultation the next day. The online healthcare professional prescribes some cold and sinus drugs for David, and Alexa immediately checks if the prescription is covered by his insurance.

After the call, Alexa informs David that the medication is fully covered by his insurance and asks if he would like to place an order for the prescribed medication. David responds affirmatively, and Alexa places an order through the Basic Care product line. Charges are automatically deducted from David's insurance plan, and the medication arrives with next-day shipping. This entire process is added to David's health profile, which will help Alexa provide David with personalized healthcare advice and incentives for a healthier lifestyle in the future.

From a cost perspective, such early preventative medicine can provide health and wellness recommendations at a nominal cost using OTC drugs. This is far cheaper than an outpatient visit to the hospital, which costed $478 on average as of 2016.

The Future of Prime Health

Through the Prime Health service offering, Amazon will have access to a plethora of user data and additional insights into both the client and healthcare provider space. Using this data, Amazon can build a comprehensive healthcare ecosystem, where consumers may one day find themselves asking Dr. Alexa what they should do about their cold, or logging into Amazon Prime to review their medical documentation. Consumers would receive recommendations from Alexa for treatments, hospitals, and doctors based on their own preferences. Healthcare would be completely personalized, with every piece of content received relating to consumers' existing conditions or habits. With this first step, Amazon can begin its ascent towards a full-service offering and becoming the dominant player in the healthcare space.

MINISTRY OF HEALTH: **PRESCRIBING PARTNERSHIPS**

LHINs in Ontario can turn to technological overhauls to enhance effiency, financing this initiative through a creative P3 bond issuance

Katlin Abrahamson and Christine Yan

Illustration by: Steven Zhang

The Cost of Care

Local Health Integrated Networks (LHINs) were established by Ontario's Ministry of Health and Long-Term Care (the Ministry) through the Local Health System Integration Act of 2006, a move designed to shift the strategic management of healthcare provision into the hands of communities. The 14 LHINs in Ontario are each responsible for the planning, funding, and integration of hospitals, support services, and long-term care facilities for their respective regions. The goal of this decentralized control is to create a patient-focused system where local coordination drives effective and efficient management of healthcare, improving care and service for Ontarian patients. Though the management of operations and distribution of funds among service providers is handled entirely by each LHIN, the quantity of funding provided to each LHIN is determined by the ministry.

However, with an aging population, the opioid crisis, and increasing emergency room visits, hospital overcrowding has become a high priority threat to the LHINs' mandate. According to a survey conducted by the Commonwealth Health Fund, 60.5 per cent of Ontarian respondents had to wait more than a month to even see a doctor about a concern. This figure remains in line with Canada's extremely high average of 58.5 per cent, and measures well above comparable countries such as the U.S. and the U.K., with 25.3 per cent and 42.5 per cent, respectively. Additionally, the same survey showed more than 50 per cent of respondents believed Ontario's healthcare system required "fundamental changes" to be more effective.

To combat the shortage of beds, the Ontario government announced in 2018 the addition of 6,000 new long-term care beds within hospitals and long-term care homes across the province, as a part of a larger plan to add 15,000 beds within five years. However, even with the province's plan to add C$6.9 billion to healthcare spending from 2017 to 2020, it will still be difficult for the province to keep up with healthcare demand.

Technology Can Provide the Remedy

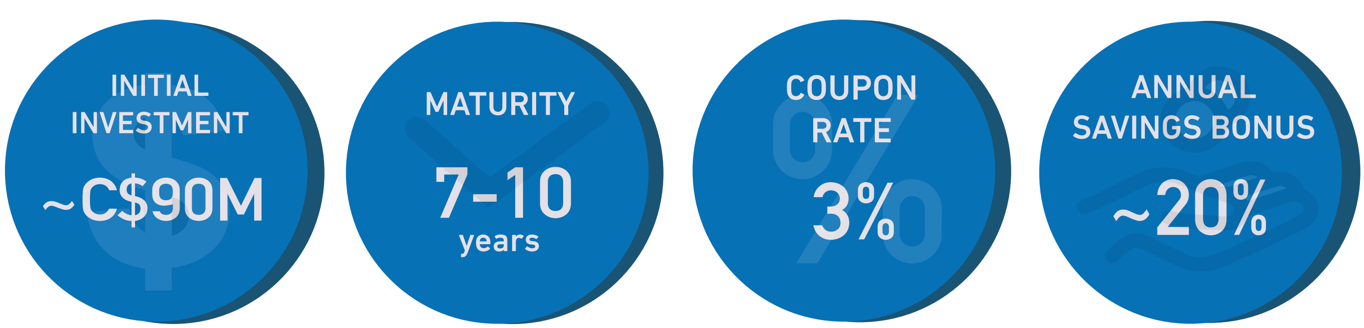
As alluded to by the Financial Accountability Office, the budget allocated to each LHIN will be insufficient for capacity requirements, as projected costs—driven by health inflation, an aging population, and population growth—are expected to outpace projected funding from 2018 to 2023. A sustainable solution to the healthcare crisis must come from innovations that can improve the LHINs' capacity and resource management and ultimately, quality of care.

One avenue of innovation that has been underexplored by Ontario health care providers is technology, which has high potential as demonstrated by its applications abroad. For example, Baltimore's Johns Hopkins Hospital implemented General Electric (GE) Healthcare's Command Centre, which uses artificial intelligence (AI)-powered technology to detect real-time patient-specific delays and bottlenecks. The NASA-inspired Command Centre acts as an intersection between people and technology. In its first year of operations at Johns Hopkins, the Command Centre's efficiency improvements in physician staffing and patient care prioritization created the equivalent of 16 new virtual beds. GE's Command Centre has also been successfully implemented in Toronto's Humber River Hospital, with 10 other projects in progress as of 2018.

The Biggest Barrier to Innovation

Despite widespread acknowledgement that technology can greatly improve the efficiency and capacity of hospitals, lack of funding has posed a barrier to LHINs' adoption of this technology. The government of Ontario has made efforts to focus on market-ready technologies, setting aside C$20 million for the Ministry's Health Technologies fund. However, depending on the size of the hospital, it can take anywhere between C$5 million and C$20 million to implement technology like the GE Healthcare Command Centre. If LHINs want to invest in technology at a scale that can lead to immediate, widespread impact, they must look towards alternative funding strategies.

CENTRAL LHIN SITUATIONAL P3 BONDS AT A GLANCE



Source: IBR Analysis

Forming Public-Private Partnerships

Instead of pushing the government for more funding to invest in technology, LHINs should encourage the Ministry to enter public-private partnerships (P3s) with investors and technology companies which offer resource-management innovations like GE's Command Centre. P3s are arrangements between government agencies and private-sector companies to finance, build, and operate projects. The increasing prominence of P3s in public services, mostly related to infrastructure in the transportation industry, is a signal of confidence in their ability to align the interests of public and private stakeholders while addressing societal needs.

The P3 solution that the ministry should adopt involves two components: first, securing the funding for investments by issuing ministry-backed bonds, and second, alleviating the service gap by implementing technology.

Issuing P3 Bonds

To address the funding shortage, LHINs interested in implementing command centre investments should, in aggregate, issue structured bonds through the Ministry. These P3 healthcare bonds would involve the provincial government as the public stakeholder and institutional investors as the private stakeholders. In addition to regular coupon payments, investors would also receive a performance-tied payback.

Many investment institutions will hold stable healthcare instruments as a means of diversifying their portfolios. Though already prevalent in current portfolios, as Canada's senior population grows, the industry may see a larger shift towards healthcare investments. P3 LHIN bonds can play a role in these investors' portfolios by offering stable government-backed returns. Certain institutions—particularly those with a stake in the well-being of the public—like insurance companies may be particularly inclined to purchase P3 LHIN bonds.

These bonds would allow the LHINs to establish a pool of financial capital to support their hospitals' efforts to increase efficiency and service capacity through technological innovation. Take, for example, the Central LHIN, which oversees healthcare for the York and South Simcoe regions of Ontario. For its seven major hospitals, the Central LHIN would employ C$90 million in raised capital to finance the installation of GE Command Centres based on estimates of investment cost per hospital bed. Assuming the same increases in efficiency, cost savings, and revenue growth as at Humber River Hospital, the Central LHIN could enjoy benefits in excess of C$35 million annually.

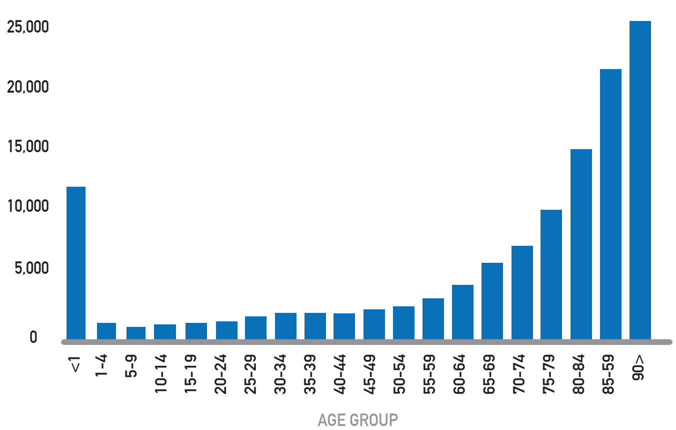
The bonds issued to investors would consist of a three-per-cent coupon rate as well as a performance-linked payback. If 15 per cent of the cost savings are returned to bondholders through the performance-payback in addition to the coupon, investors of the Central LHIN project could expect returns of 8.8 per cent annually, with a sensitized range of approximately 6.6 to 11.5 per cent. Moreover, the interest, as well as 20-per-cent annual principal repayments, would be completely covered under the annual cost savings and increased revenues, with a net C$9 million annual bottom-line contribution over the first five years, and C$35 million in each subsequent year. Ultimately, these healthcare bonds would allow LHINs to establish a pool of capital separate from the strained Ministry budget to support their hospitals in increasing efficiency and service through technological innovation.

Implementing the Treatment Plan

The biggest risk this solution poses to the LHINs is the implementation risk of technological investments. The attractiveness of the P3 bond to both investors and the government is linked to the potential cost savings realized by the technology the bonds will fund. For the LHINs themselves, the improvements to resource management and thereby, quality of care, can only materialize through careful management of the implementation process and evaluation of the associated impact.

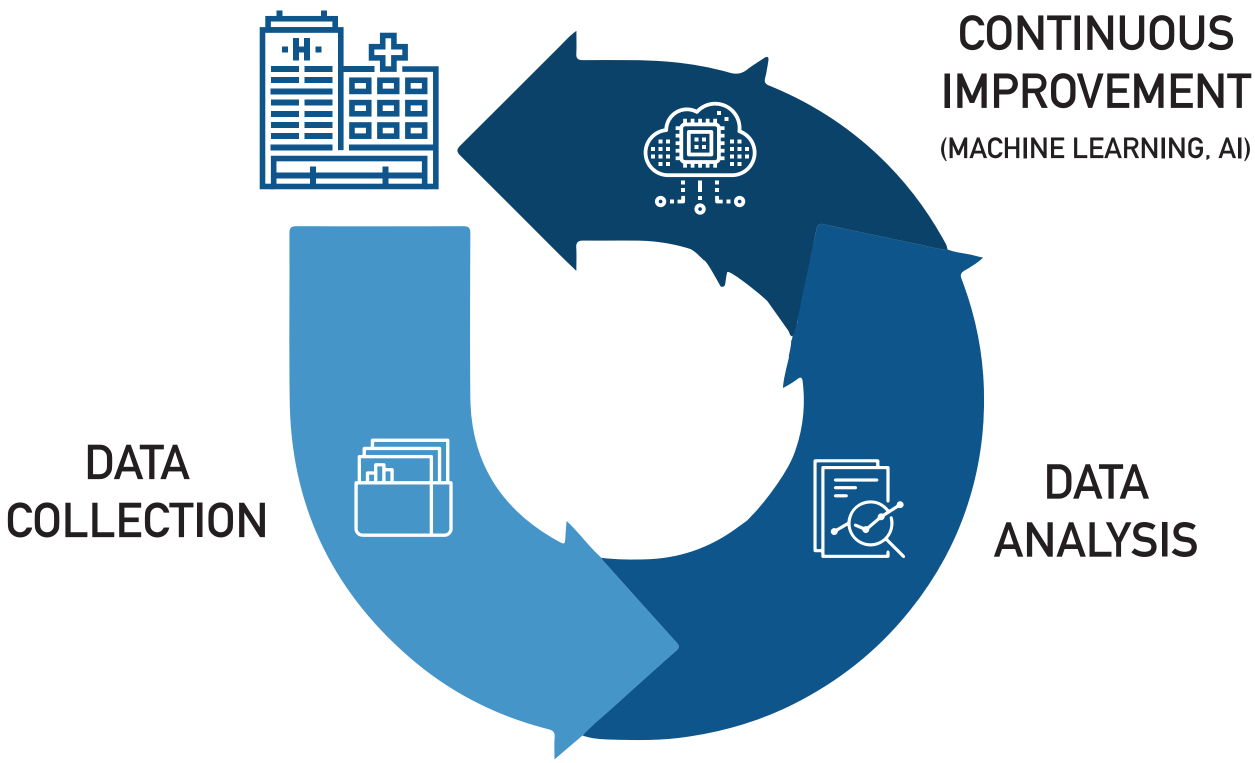
Because the pool of bonds would be issued and backed by the Ministry of Health, oversight and distribution of the funds generated from bond issuance would still fall to the ministry. Each year, LHINs would apply to add new projects

ONTARIO GOVERNMENT HEALTH EXPENDITURE PER CAPITA (C$)



Source: National Health Expenditure Database, Canadian Institute for Health Information

POSITIVE FEEDBACK LOOP



to the pool, with details about each hospital's project, the expected increase in capacity, and cost savings. This should be done to ensure that individual hospitals in LHINs can tailor the project to their specific needs while implementing a system of control that delivers assurance that the LHINs as a whole will achieve performance goals.

Once the hospital has obtained the necessary funds, due to the complexities of the healthcare system, the LHIN's greatest focus should be placed on stakeholder buy-in. At Humber River Hospital, implementation of the GE Command Centre resulted in front-line workers' opposition due to an initial fear of losing decision-making power. To achieve the support of staff, the hospital engaged them during the entire planning and implementation process including the curation of efficiency metrics, technology integration, and testing. This allowed the hospital to experience the benefit of increased efficiencies and improved patient prioritization.

The final step of the implementation process would be for the Ministry to evaluate the different innovations at the hospitals to which they provide funding. To do this, hospitals will need to track and report the cost savings and operational efficiencies realized through the implementation of the technology. An impact assessment based on these metrics should be required for hospitals to understand the comprehensive effect of the technology on hospital capacity and quality of care. If hospitals have implemented technologies like GE's Command Centre, the highly-sophisticated nature of AI-powered, data-driven technology will be able to self-monitor and report, eliminating the need for additional hospital resources to measure the results. Such an impact assessment would not only provide investors with transparency during the process of allocating annual savings bonuses but would also help LHINs establish a benchmark against which future applications for funding could be evaluated.

Public and Private Prosperity

An aging population with increasingly complex needs and public spending constraints are leading to an inevitable healthcare crisis for the Canadian population. The two-fold P3 solution would allow the LHINs to better satisfy their commitment to the population they serve by increasing capacity. Issuing healthcare bonds to invest in technology would not only expand hospitals' capacities, but would provide a sustainable approach to healthcare's financial woes. Ultimately, greater hospital efficiencies would allow the LHINs to improve quality of care as frontline healthcare workers spend more face-to-face time interacting and providing a personal touch to patients. Reaching to the private sector and forming P3s to invest in efficiency-enhancing technologies in hospitals is imperative to retain the integrity of the public healthcare system.

PFIZER: **BETTING ON SUCCESS**

Pfizer can use prediction markets to better determine the success of in-development drugs, reducing wasted R&D expenditures

Ethan Milne

Illustration by: Steven Zhang

A Plethora of Pharmaceuticals

Pfizer was founded in 1849 by cousins Charles Pfizer and Charles Erhart. In the 170 years since, the company has commercialized and distributed medical breakthroughs, growing into a pharmaceutical giant. Pfizer offers more than 370 products ranging from recognizable brands like Advil and Robitussin to more exotic concoctions like antiemetics for chemotherapy and antibiotics. In 2018, this product mix generated revenues of $53.6 billion for the company.

Pfizer's success is largely attributable to its investment into the research and development of new drugs. The company is a leader in drug development and had 10 FDA approvals throughout 2017. While a key factor contributing to Pfizer's market dominance, drug development carries inherent risk and there is no guarantee that any experimental drug will make it to market. Pfizer's willingness to carry this risk, as evidenced by its continuous increase in research and development (R&D) investment, serves to further accelerate the development and delivery of potential blockbuster treatments to individuals around the world.

Volatility in R&D Expenses

In 2013, researchers analyzed a series of new drugs brought to market between 2002 and 2011, comparing analyst forecasts and real-world results. The study revealed that sales forecasts for these new pharmaceutical products were wildly inaccurate, with 60 per cent of analyst consensus forecasts having a margin of error greater than 40 per cent. Furthermore, a study by Citi Research concluded that two-thirds of novel drugs that make it to market fail to meet analyst expectations for first-year revenues and that a strong correlation exists between first-year sales and future performance. Given that pharmaceutical companies allocate R&D budgets based on forecasted drug sales, poor forecasting can lead to substantial losses.

The issue of unreliable forecasting must be addressed soon. Industry R&D expense growth has exceeded revenue growth for the past decade, indicating a need for stronger budget allocations. Pfizer's R&D expenses were $8.01 billion for fiscal 2018 and have increased by four per cent since 2017, outpacing revenue growth of two per cent over the same period.

To improve its forecasting accuracy, Pfizer should implement a prediction market to be used by internal analysts, salespeople, and other employees. Prediction markets have been successfully used by other companies to improve the effectiveness of management decisions. Such technology holds promise to be used for an analogous purpose in this novel market.

What is a Prediction Market?

A prediction market is a platform where individuals can trade contracts with payoffs linked to the binary outcome of a specific event. For instance, a contract could be created with payoff tied to the outcome of a fair coin toss: if the coin lands heads up, the holder receives $100. If it lands tails up, the holder receives nothing. A 50-per-cent chance of receiving $100 translates to an expected value of $50, so one would expect the contract to trade at a price close to $50. This simple example illustrates a basic principle of prediction markets: the amount that traders are willing to pay for a given contract corresponds to their subjective estimate of an event's likelihood of occurring.

Contracts can be assigned payoffs based on any binary outcome imaginable. The premise behind prediction markets is the aggregation of information and beliefs; encouraging employees from different departments with

PREDICTION MARKET FLOWCHART

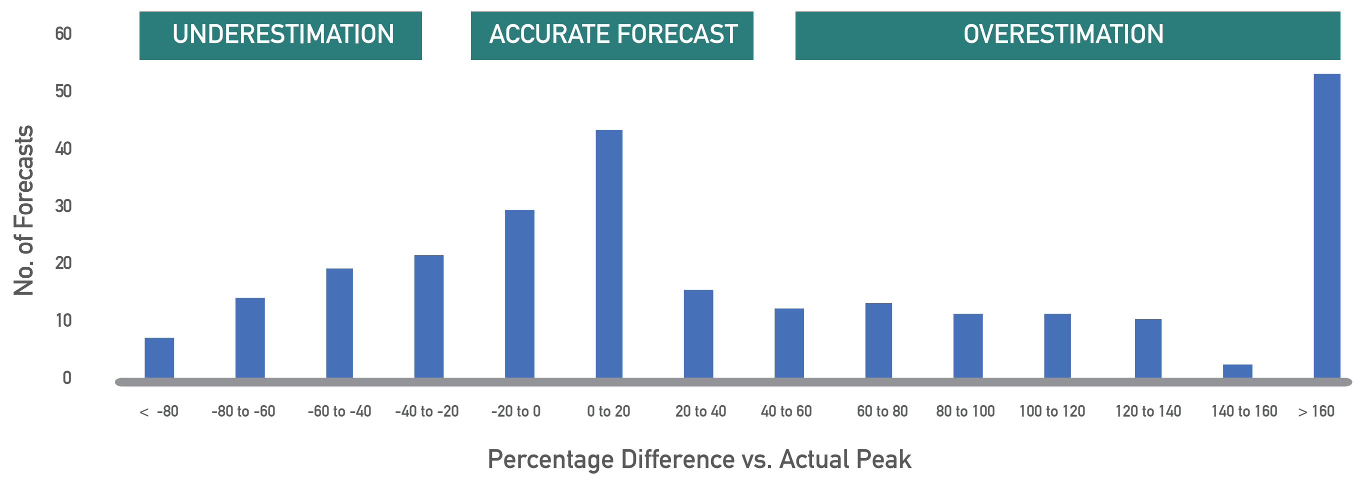
PURCHASING TOKENS

A market is set up with multiple possible events and a token for each event outcome. Each token will pay out an equivalent amount if the event occurs. Participants can invest in the tokens for these "idea futures." Tokens can be sold and traded freely with other participants.

VALUING TOKENS IN THE MARKET

Since there is economic incentive to buy "under-valued" tokens and sell "over-valued" tokens, the tokens are ultimately priced accordingly to supply and demand. Thus, the tokens in these prediction markets represent the probabilistic predictions of events.

INACCURACY IN PHARMACEUTICAL FORECASTING



Source: Nature Reviews

access to different information to trade contracts allows the market to converge on the most accurate predicted value of the contract. Oftentimes, these markets allow companies to factor in information that employees may otherwise avoid discussing—for example, project delays.

Prediction markets are currently being used by companies like Google and Intel to forecast new product sales and even the likely outcome of new research and innovation activities. Overall, the use of these prediction markets has yielded positive results: Hewlett-Packard claims that BRAIN, the internal prediction market it piloted for Swisscom, forecasted results 27-per-cent closer to actual financial metrics than polling groups and 17-per-cent closer than top experts, and Intel reportedly saw its internal prediction market outperform official demand forecasting by 20 per cent.

"Prediction markets are currently being used by companies like Google and Intel to forecast new product sales and even the likely outcome of new research and innovation activities. Overall, the use of these prediction markets has yielded positive results."

In the previously referenced study, while 60 per cent of analyst consensus forecasts had an error margin of more than 40 per cent, the median consensus prediction for all drugs studied had only an error of four per cent. This indicates that even if the high variance of forecasts makes any one analyst's prediction unreliable, aggregating results yields a prediction close to reality. Prediction markets are uniquely suited to this situation since they aggregate a wide array of perspectives and encourage precise quantification of subjective belief. Furthermore, the historical performance of prediction markets at forecasting other metrics such as the success of new sales initiatives suggests that they would also be able to predict sales of new drugs with a relatively high degree of accuracy.

Pfizer's Prediction Market

The new prediction market can be used by Pfizer analysts and salespeople to predict the success and sales of drugs in the development pipeline. Participants will use imitation currency to purchase contracts from one another based on their forecasts for expected market success of a new drug. Google, for example, used "Goobles" as currency in its prediction markets and rewarded small prizes to employees that accumulated the highest amounts of Goobles. Similarly, top forecasters in Pfizer's prediction markets could earn small prizes as their forecasts are proven correct, providing a pecuniary incentive to trade based off of one's best inclination.

While one might suspect that trading with imitation currency would lead to less accurate information, empirical data shows that this is not so. A 2008 study in The Journal of Prediction Markets found that valid and robust results were obtained whether real or imitation currency was used.

Pfizer could ask its prediction market: "Will sales of Drug X exceed $1 billion in 2019?" Using imitation PfizerBucks (PBs), participants could then purchase two contracts, with one giving the holder a 100 PB payout if Drug X exceeds $1 billion in sales, and the other giving the holder a 100 PB payout if sales fall below $1 billion. Participants could buy and sell either contract on the internal market, with those who believe in Drug X trying to accumulate contracts paying out if it succeeds and vice versa.

Pfizer would look at the price of each contract to see what the market in aggregate believes Drug X's odds of success to be. If the market price is 80 PB for this contract, then the market believes there is an approximate 80-per-cent chance that sales will indeed exceed $1 billion. Pfizer can use that information to decide whether or not to launch the drug. In the case where market prices indicate a very low probability of success and management decides not to proceed with an initiative, the contracts will pay out as if the event occurred, but was unsuccessful.

The new prediction market strategy should be implemented parallel to Pfizer's existing forecasting processes. Additionally, Pfizer should collect employee feedback and work with the selected vendor to make continuous improvements to the platform.

Concerns About Prediction Markets

Cunning employees could trade contracts in order to manipulate market prices and influence the outcome to their benefit. For example, an employee in research could stock up on contracts for one of his or her clinical tests to fail, and then skew the results so that the contract will pay out. To prevent such manipulation, limits should be established on individual positions, limiting the benefit that could be realized and consequently reducing the incentive to engage in dishonourable behavior. Individuals with external compensation directly tied to the outcome of the event should also be prevented from participating in the market for similar reasons.

Despite the fact that some information may be limited by the exclusion of certain participants, prediction markets have a track record of maintaining a high level of accuracy thanks to a "wisdom of crowds" effect. Most notably, a famous experiment conducted by researcher Philip Tetlock demonstrated that the aggregation of predictions from laypeople spread throughout the U.S. could outperform intelligence analysts with access to classified information in the forecasting of complex geopolitical events.

Another risk associated with this strategy is the need for many participants to leverage the "wisdom of crowds" effect and ensure prediction accuracy. Public prediction markets with well-calibrated forecasting in the realm of computers and internet, politics, and science have been shown to have as low as 27 market participants without compromising accuracy. With more than 90,000 employees, it is unlikely that Pfizer would find itself with a shortage of participants.

Additionally, prediction markets face legal issues given their inherent similarities to gambling. Avoiding the use of real currency in the company's prediction market would mitigate this risk, as it parallels the implementation plan of other companies' prediction markets. Contracts traded on internal company markets do not qualify as securities and thus would not be regulated by the U.S. Securities and Exchange Commission.

Forecasted Fortunes

Sales forecasting is but one application of prediction markets in the pharmaceutical industry. Economists such as Robin Hanson, one of the earliest proponents of prediction markets, are exploring the applicability of these markets for forecasting the outcome of scientific study replications. This could provide value to pharmaceutical companies when integrated into their development pipelines. Other applications may include identifying promising new drug solutions and compounds worth investigating, forecasting participant enrolment in later-stage clinical trials, and forecasting the likelihood of new regulations that could impact Pfizer's business. If Pfizer is able to harness the "wisdom of the crowds," the pharmaceutical giant will be one step closer to overcoming one of the pharmaceutical industry's greatest problems, the volatility of R&D risk.

BOARDWALK: **HOUSING A PROFITABLE PORTFOLIO**

As it pursues geographic expansion, Boardwalk can look to provide purpose-built student accomodation properties

Matthias Eyford and Dante Mascarin

Illustration by: Alvin Tse

Lacklustre Performance

Established in 1984, Boardwalk is a Canadian open-ended real estate investment trust (REIT) that manages more than 200 high-, medium-, and low-density residential buildings in Alberta, Saskatchewan, Ontario, and Quebec. Boardwalk went public on the Alberta Stock Exchange in 1994 and officially transitioned into a REIT in 2004.

Based on unit price performance, Boardwalk has had the worst trailing twelve month return relative to comparable Canadian residential REITs. At the end of February 2019, the company's share price had depreciated by 9.6 per cent over the preceding twelve months while the S&P/TSX Capped REIT Index rose by 12.4 per cent. This underperformance can largely be attributed to the recent oil downturn as the majority of Boardwalk's property portfolio is concentrated in Western Canada, with heavy ownership in Calgary and Edmonton.

A Benign Status Quo

Although Boardwalk's core end market of Alberta has enjoyed continued population growth, housing starts are down more than 60 per cent from their 2014 high, suggesting that the market may have been overdeveloped. A depressed energy sector paired with a potential oversupply of properties has potential to result in a near-term erosion of funds from operations and net operating income in the apartment REIT sector.

In an effort to quell investor concerns over the portfolio's regional concentration and its energy exposure, Boardwalk has begun to employ a long-term strategy of geographical diversification into markets including Toronto and Vancouver. Through this expansion into what management sees as secularly high-growth markets, Boardwalk plans to develop a portfolio nearly equally balanced between Alberta and Saskatchewan, and other markets. With Calgary and Edmonton rental income currently constituting 59 per cent of total net operating income, such diversification is justifiable. However, in the context of rising interest rates, increasing regulation, and past price appreciation in Toronto and Vancouver, the risks associated with this expansion strategy outweigh the possible benefits of such diversification.

The Opportunity

Venturing into the Purpose Built Student Accommodation (PBSA) sector, informally known as "student housing," is a promising opportunity for Boardwalk. The company already has the managerial infrastructure and expertise in place to execute on this opportunity.

Several macroeconomic trends are beginning to shape PBSA as a desirable sector. Over the past 10 years, Canadian universities' aggregate student population has grown by a compound annual rate of 2.2 per cent, surpassing the 1.2-per-cent compound annual growth the general Canadian population saw over this same time. To accommodate a larger student body, post-secondary institutions such as the University of Toronto have been seeking out joint ventures with real estate developers to construct student residences. Canadian universities are also increasing their international student enrolment, as foreign students' tuition payments have become increasingly important to universities' bottom lines. International student enrolment increased by 11 per cent in the 2016 to 2017 school year, further fuelling the increase in demand for post-secondary accommodation.

The fragmented PBSA market in Canada presents a rare opportunity for Boardwalk to capitalize on the gap in the real estate market. Boardwalk's core expertise lies in the management of apartment buildings, a type of property not too dissimilar from PBSA. The company could quickly and feasibly develop the capabilities required for success.

"The fragmented PBSA market in Canada presents a rare opportunity for Boardwalk to capitalize on the gap in the real estate market. Boardwalk's core expertise lies in the management of apartment buildings, a type of property not too dissimilar from PBSA."

Furthermore, the PBSA sector will act as a natural hedge to Boardwalk's existing strategy. In a recession, post-secondary enrolment tends to rise—people logically seek to increase their education and credentials in order to be more competitive in the volatile job market . Consequently, more student housing accommodations are needed and vacancy rates within the student housing sub-sector decrease. For this reason, student housing is often deemed "recession resistant." The potential to exploit this natural hedge is especially beneficial in the context of an oil price downturn, providing a stable revenue stream to offset poor performance in core Western Canadian properties.

Foreshadowing Success

The larger size of the American PBSA market has led to the formation of several dominant players, which can serve as an example for Boardwalk. One of these is

American Campus Communities (ACC), a REIT that owns more than 150 residential buildings and more than 30,000 units across the U.S. Its locations are strategically chosen to serve students attending a specific university and it has excelled in this space, having grown wholly-owned net operating income by a 23-per-cent compound annual rate since 2005.

ACC pursues public-private joint ventures, wherein post-secondary institutions lease their land to private REITs in exchange for the construction and operation of student housing. The REIT also operates a wholly-private model focused on off-campus housing. Given the similarities between the U.S. and Canadian real estate markets, Boardwalk should aim to replicate ACC's success north of the border. While the U.S. PBSA industry is less attractive to new entrants because of higher industry consolidation and declining post-secondary enrolment rates, opportunity continues to abound in Canada.

Implementation

Aging university dormitories and reduced government funding suggest that post-secondary institutions will have difficulty satisfying future student housing demand. Thus, as seen in the U.S., it is prudent to initiate lease partnerships with post-secondary institutions. By outsourcing student housing to an experienced and reputable third party, universities can focus on their core competency of providing quality education.

In addition to these partnerships, Boardwalk should further diversify its strategy by pursuing purely private developments, creating a defensible market position. Mimicking ACC's U.S. success, Boardwalk should seek off-campus properties relatively close to universities. Moreover, to minimize operating and administrative expenses, Boardwalk should prioritize the concentration of properties in select cities as opposed to immediate geographic diversification. While initial operational establishment of administrative functions in these new cities will incur significant capital expenditure, these fixed cost centres will prove scalable in the long-term.

While the overall strategy recommendation is generally geographically agnostic, it is advisable that Boardwalk stay away from large metropolises such as Toronto and Vancouver and instead focus on "university towns" such as London, Hamilton, and Waterloo. Doing so would mitigate the macroeconomic risks of near-term property devaluation given the price appreciation Canada's metropolises have seen. In addition, there is intense institutional capital competition for residential assets in these regions, serving to increase acquisition prices and reduce returns. Instead, target geographies should possess high projected enrolment growth rates, reasonable property valuations, post-secondary institutions open to joint venture partnerships, and relatively fragmented PBSA markets.

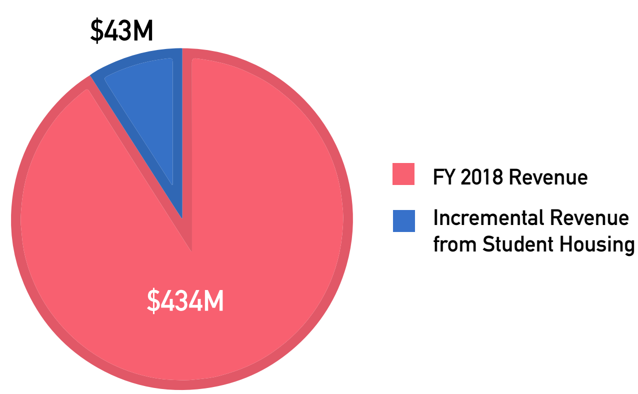
The aggregate university student population in London, Hamilton, and Waterloo stands at approximately 130,000. Assuming 80 per cent of this student population lives in PBSA and that the average monthly rent between the three cities is $690 per bedroom, the dollar value of the total addressable market amounts to $861 million annually. A mere five-per-cent market capture results in potential annual revenues of $43 million. If this market capture occurs after one year, approximately 10 per cent of Boardwalk's total revenues would stem from PBSA. This represents a stream independent of the company's core operations that would help achieve the REIT's near-term objective of diversifying revenues. This illustrates the potential for the natural hedge to comprise a significant portion of Boardwalk's top line.

Risks

Because students tend not to remain in one geography for a long period of time, PBSA properties see increased turnover and higher churn rates. Assuming students in a four-year undergraduate degree spend three years in a residence, churn rates would stand at 33 per cent, substantially higher than typical of residential properties. While the higher churn may be more managerially intensive, Boardwalk must simply acknowledge it as a necessary part of the strategy and draw on its existing operational experience to minimize the associated costs. There is a benefit associated with this turnover; leases are effectively marked-to-market upon each tenant's departure, so rental rates can be regularly adjusted to reflect prevailing market rates.

Because Boardwalk has concentrated on select geographies, there is furthermore the risk of unexpected

REVENUE DIVERSIFICATION



Source: IBR Analysis

UNIVERSITY ENROLMENT (NUMBER OF FULL-TIME STUDENTS)

University of Waterloo	36,600
University of Ottawa	36,500
University of Montreal	36,320
Laval University	31,020
McMaster University	30,600
Western University	30,522
Concordia University	27,650
University of Guelph	26,900
Carleton University	25,400
UQ Montreal	24,850
Queen's University	24,400
Université de Sherbrooke	16,810
Dalhousie University	16,590
Wilfrid Laurier University	16,500
Memorial University of Newfoundland	14,940

Source: Universities Canada

legal and regulatory issues arising. This risk is inherent in any form of real estate development but amplified in pursuit of new and unfamiliar ventures. Establishing joint ventures with universities will help to mitigate any unexpected roadblocks; Boardwalk could make use of the university's experience in developing PBSA properties.

Despite the benefits of such a shift in strategy, the decision would likely be met with resistance from investors. Entry into the PBSA market represents a substantial divergence from Boardwalk's historical Western Canadian focus and it will need to develop additional competencies to ensure success. However, in the long term, the resulting revenue stream diversification will make the stock more resilient to a commodity-sensitive Canadian economy. In communicating the strategy to unitholders, Boardwalk's management should acknowledge the strategy's risks and clearly explain its end goal of increasing revenue stability.

Building Up PBSA

While real estate is generally seen as a safe asset, Boardwalk's current portfolio has proven too volatile for investors' liking and the REIT's shares have been punished. This Canadian PBSA opportunity will provide a natural hedge to the cyclical volatility of Boardwalk's Western Canadian assets and the REIT's existing management capabilities will serve well in helping the company expand into this new type of residential property. Given the proven success of this business model in the U.S. market, Boardwalk can establish itself in the Canadian PBSA market.

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