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Bombardier: Spreading Its Wings

A plan to get Bombardier's CSeries off of the ground

THE IVEY HBA STUDENT BUSINESS STRATEGY MAGAZINE

Ivey Business Review is an undergraduate business strategy organization conceived, designed, and managed exclusively by students at the Ivey Business School, 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 exclusively 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 blog platform allows students and young alumni to further the IBR mission year-round.

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FROM THE EDITORS

Over one hundred and fifty years ago, a young scientist was religiously mapping the connection between species over time, trying to find and understand origin. His research, however, grew beyond ancestral roots, evolving into an understanding of how complex organisms originated from the simplest of chemical reactions. Darwin's major contribution to the Theory of Evolution is the merciless razor of natural selection; however, this concept extends beyond nature. BlackBerry's empire crumbled under pressure, while Uber's success seems predetermined. In a world where business evolution is accelerating, a new trait has emerged dominant: the product ecosystem.

"Failure To Deliver" highlights the intricacy of Alibaba's e-commerce platform, and how one of its strongest competitive advantages – third party delivery – could jeopardize its expansion into food and medicine. "Spreading its Wings" discusses the importance of after-sale services in the airline industry and how Bombardier needs a strategic partnership to get its CSeries project off of the ground. Finally, "The Next Episode" explores how Rogers and Shaw can open up Shomi to the general public to act as an all-in-one media hub to set their footing in the future of telecommunications.

As markets evolve, industry incumbents will be forced to adapt; many will struggle, while others will flourish. IBR's Spring Issue highlights the difficulty of expanding the NHL across North America, as well as bringing Geothermal Energy to Canada. In addition, this issue showcases the growth potential in agriculture investing and the global natural gas industry.

While each new day is different from the last, the change may be insignificant. It is when these incremental changes accumulate over time that uncertainty develops, creating a future nearly impossible to predict. Those not paying attention may soon find themselves at a disadvantage, or far worse; extinct. The Ivey Business Review examines all information available, combined with the intelligence and creativity of tomorrow's greatest leaders, to direct, rather than succumb to, the evolution of business.

While we may not know what the future holds, we will not be surprised when we get there.

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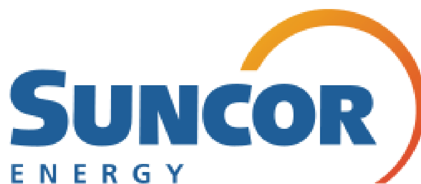

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SHALE GAS & FRACKING: ENERGY SECTOR EVOLUTION OR REVOLUTION?

It is well known that hydraulic fracturing will revolutionize the natural gas industry, providing countries better access to their resources trapped in dense shale formations. However, there has arisen extensive controversy on environmental impact, with some countries going as far as banning the process entirely. President of Union Gas, Steve Baker, and Executive Director at EnergyVantage, Mel Ydreos, came to speak to Ivey Students regarding the process, putting controversy into context, and speaking from both the consumer's and industry's perspective.

Ivey Business Review gives students a voice to convey their opinions and strategic solutions to real world business problems. The IBR Speaker Series allows students to discuss with industry thought leaders, providing the same opportunity to speak their mind and learn about current global issues. We thank Steve Baker and Mel Ydreos for taking the time to answer our questions and those of fellow Ivey students.

Steve Baker

IBR discusses with Steve Baker, president of Union Gas, about what natural gas means to Canadian consumers, the company's operations, and the expansion strategies of Canada's second largest natural gas utility.

IBR: As Canada's second largest natural gas utility, can you describe Union Gas's role in connecting natural gas exploration to the Ontario consumer?

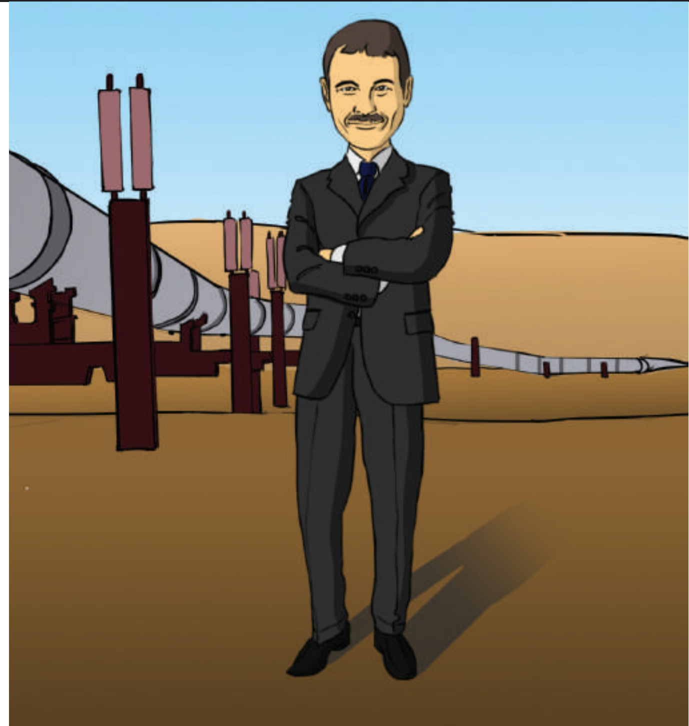
Steve: Union Gas contracts for natural gas supply from all over North America, including Western Canada, the US Gulf Coast, and most recently from the Marcellus and Utica shale basins in Pennsylvania and Ohio. Union Gas contracts for pipeline transportation capacity on various third party pipelines to move that gas to Ontario where it then connects onto our network. Once that gas gets to Ontario and into our pipeline system, we move it either into our underground storage facilities if it's not needed at that point in time, or we transmit and distribute that gas all across Ontario to various residential, commercial, and industrial customers.

IBR: How does Union Gas decide how much to charge consumers for natural gas?

Steve: We do not make that decision. The rates that Union Gas charges customers is regulated by the Ontario Energy Board (OEB). The price of the natural gas commodity itself is unregulated in North America. When Union Gas buys natural gas for customers that we serve directly, we pass that cost on to consumers at our cost with no mark-up. Union Gas makes money based on the rates charged on the assets we use to distribute, transmit, and store natural gas, which are regulated by the OEB. The OEB determines the overall capital structure and return on equity that we can get on our assets as well as the costs we incur to provide service to customers. This is what determines what customers pay for natural gas service.

IBR: If Unions Gas's return is regulated, how does the company grow against its competitors, if they are also regulated to similar returns?

Steve: The way we grow is by developing and expanding our system where it makes economic sense. As an example, we are currently in the process of completing some major expansions on our large transmission pipeline system that extends from Sarnia to Toronto, to connect the new Marcellus and Utica shale gas to our customers. Even though our return is fixed and regulated, the way we grow our business and grow our revenues is to expand our system in order to meet customer demand for additional or new service from our company.



Steve Baker
President, Union Gas

Steve Baker is the President of Union Gas Limited, Spectra Energy's Ontario-based natural gas storage, transmission, and distribution holding firm with more than 100 years of experience and service to customers. He brings a wealth of financial, business development, marketing, and customer service experience to the role, a position he's held since January 2012. Steve joined Union Gas in 1989 and has held a number of executive leadership positions spanning the business. Prior to becoming President, he served as VP and treasurer of Spectra Energy Corporation.

Steve earned a BA in Honours Chartered Accountancy studies and a Master of Accounting from the University of Waterloo, and holds CPA and CMA designations. He is a member of the Institute of Chartered Accountants of Ontario, the Canadian Institute of Chartered Accountants and The Society of Management Accountants of Ontario.

About Union Gas

Union Gas Limited, a Spectra Energy company, is a major Canadian natural gas storage, transmission, and distribution company with $6.4B in assets. Serving over 1.4M residential, commercial, and industrial customers, Union Gas provides natural gas to communities across northern, southwestern, and eastern Ontario. The company owns and operates the Dawn Storage Hub in Southwestern Ontario, which is the largest integrated underground storage facility in Canada, providing an important link in the movement of natural gas across North America. Listed as one of Canada's Top Employers for 2014, the company has approximately 2,200 employees.

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IBR: If I live in your service area, do I have to buy gas from you?

Steve: You do not have to buy gas from our company, as the natural gas market is unregulated. Consumers in Ontario can buy the gas commodity from Union Gas, where we pass the commodity cost through to consumers at cost with no mark-up. Alternatively, customers can also buy gas themselves, or through a third party energy marketing company. Typically, most of our large commercial and industrial customers in Ontario buy their own gas, either directly or through a marketer, while most residential customers buy gas through our company.

IBR: How does Union Gas manage the range between the winter and summer seasons?

Steve: Ontario is blessed with good geology. We have many old, depleted natural gas fields which make great underground storage facilities. Ontario actually used to produce a lot more natural gas than it does today. Once those gas fields were fully produced, we redeveloped them for natural gas storage. In the summer, when consumer gas consumption is the lowest, we take gas that comes into our system and we inject that gas underground into our storage facilities. In the winter, when demand is higher, we take that gas out of storage, put it into our pipeline system, and distribute it to customers.

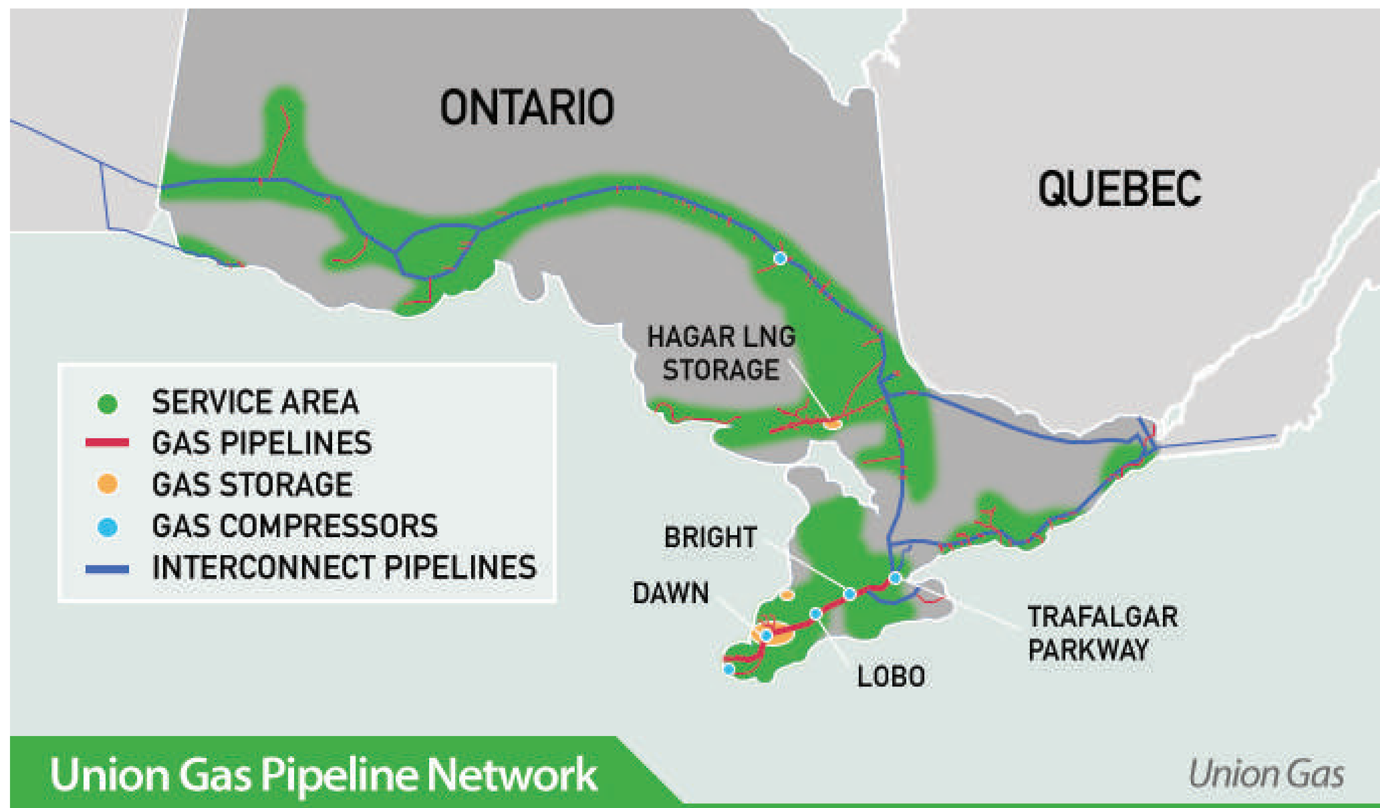
Storage of natural gas is also crucial as the province moves toward renewable energy generation like wind and solar, where natural gas can act to balance the electricity supply in Ontario. Natural gas can be taken out of storage to fuel gas fired power plants when renewable energy generation is down. Then when renewable generation is on, we can take that gas and put it back into storage. Storage serves a lot of purposes and provides significant flexibility to the province to meet overall energy demands.

IBR: Given discussion on fracking, and the dangers of pumping fluids back into the earth, is this a safe practice?

Steve: Underground natural gas storage is very safe. Union Gas has been storing natural gas this way for over 50 years. Our storage is all naturally occurring, and we're simply putting gas back where it was originally stored for millions of years. All of the storage pools we operate have a very thick and strong cap rock on the top of the reservoir. We monitor the storage wells to ensure we don't overpressure a pool and damage the reservoir, pressurizing it to a maximum of approximately 70% of historical pressure levels. That gives us the confidence that we can manage that pool and maintain integrity.

IBR: What does Union Gas do to keep its pipelines from leaking or exploding?

Steve: When Union Gas constructs new facilities, they meet very high standards. Our number one area of focus when we build new facilities is to meet all required codes and standards, and we often choose to go well beyond the minimum standard. Once the facilities are in the ground, we inspect those pipelines approximately every seven to eight years. Through the use of pipeline inspection tools and X-Rays, we look for damage like corrosion and pipeline thickness erosion. We also periodically dig up sections of the pipeline and visibly inspect it in order



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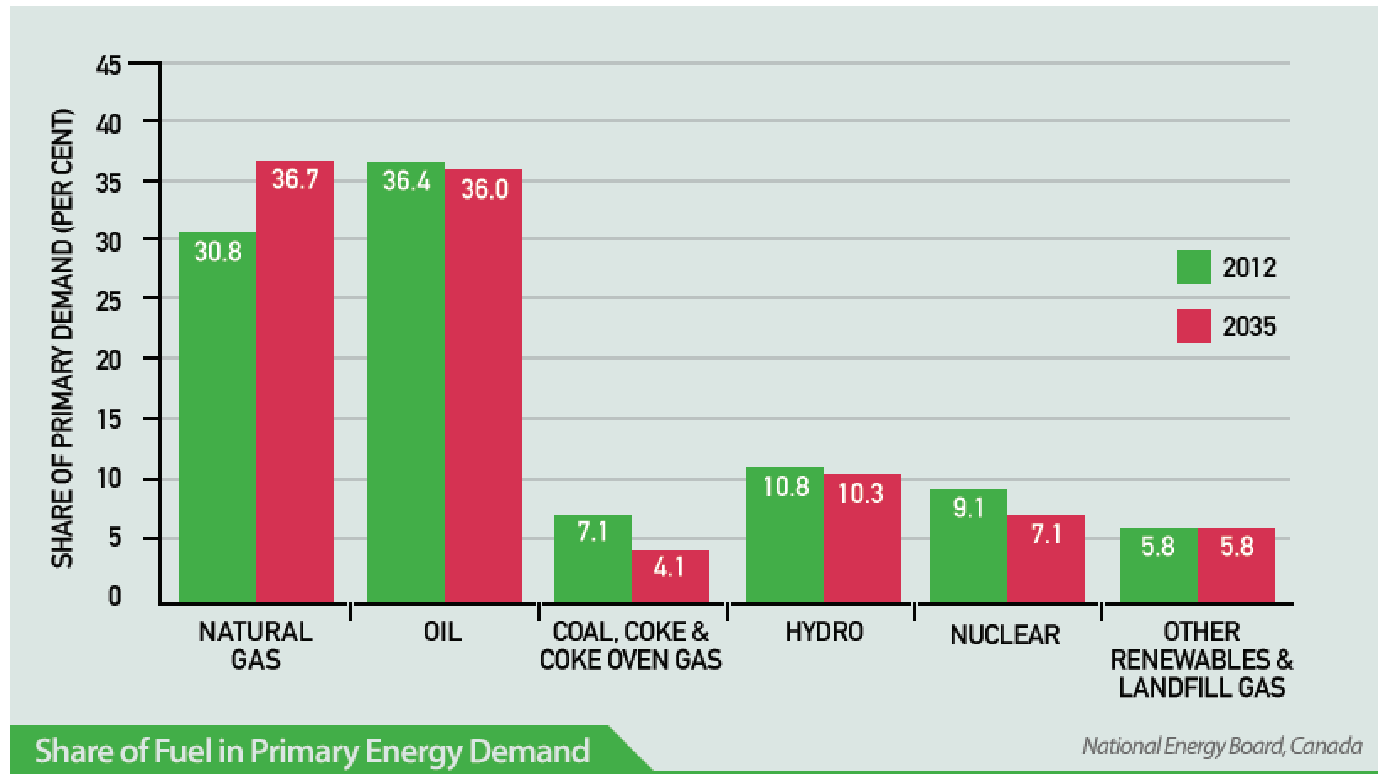

Share of Fuel in Primary Energy Demand

to assess the overall condition of the pipe. If we run into any issues, the pipe is repaired or replaced.

IBR: What is a typical life cycle of a natural gas pipe?

Steve: There is no single answer. The lifecycle of a pipeline really varies based on various factors, including the vintage of the pipe itself and the ground conditions in which the pipe is located in. Through our pipeline integrity program, we're consistently monitoring our pipelines and we're very proactive with checking pipelines susceptible to hazardous environments. Most of the pipelines that we build will have at least a 40-50 year life cycle.

IBR: Traditionally, Union Gas has procured its supply from far away places like Western Canada and the Gulf Coast. Do you see this changing given the rise of shale gas?

Steve: As a natural gas utility, Union Gas focuses on having a diverse portfolio of gas supplies. These supplies are obtained from across North America and delivered on many different pipelines. This helps us to provide our customers with a more diverse and stable commodity price. We are very supportive of supply diversity and will continue to keep buying our supply from various locations.

IBR: Union Gas has been vocal in its opposition to the TransCanada Energy East pipeline. Given the increase in cheap supply from Pennsylvania, why would Union Gas oppose removing sections of the underutilized main line from service?

Steve: Firstly, Union Gas is not opposed to the Energy East Pipeline project. The Energy East project involves TransCanada wanting to convert about 3,000 km of its "Mainline" gas pipeline to oil service from Alberta to Ottawa. For 90% of the project, from Alberta to North Bay, that existing natural gas pipeline system is underutilized today. Union Gas is not opposed to finding better uses for underutilized pipeline capacity. Our issue is with the 300 km section from North Bay to Ottawa. That pipeline is fully utilized today and is critical for meeting the market demand in Ontario, Quebec and the US Northeast, regardless of whether the gas is sourced from Western Canada or the Marcellus. The Energy East project would have that line be converted to oil transportation with a new replacement gas line built in its place. We believe the proposed replacement natural gas pipeline is too small to meet the gas market requirements.

Further, if TransCanada has to build a new replacement pipeline as a result of converting the existing North Bay - Ottawa line from gas to oil, our view is that the higher capital cost and related capital risks relative to the existing line being converted to oil transporation should be borne by the Energy East project and its shippers, not by Eastern Canada's gas consumers. All Union Gas, Enbridge Gas Distribution and Gaz Metro are looking for is to be left cost and capacity neutral.

IBR: Do you see that your concerns are being recognized?

Steve: TransCanada has now filed its Energy East application with the National Energy Board, which is currently reviewing the application. We expect them to make a decision as to whether the application is complete sometime this spring. Assuming the

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application is deemed complete, the NEB would commence the hearing process where we will voice our concerns.

It should be noted that all three major gas utilities in Eastern Canada - Union Gas, Enbridge Gas Distribution in Ontario, and Gaz Métro in Quebec - have raised our concerns with TransCanada directly. Our preference is always to negotiate a settlement and reach agreement outside of the formal regulatory process. In this case, we did not reach an agreement and will be going down the regulatory path.

IBR: Has Union Gas considered signing up for capacity on one of your parent companies' pipelines to supply your Eastern Ontario Customers?

Steve: Yes. Our parent company is planning a new project to move Marcellus and Utica gas to Ontario – the pipeline is called the NEXUS Gas Transmission project. We have signed an agreement for capacity to move Marcellus and Utica gas on thatpipeline to Ontario. Given the significant natural gas supplies being produced in the Marcellus and Utica shale plays, we feel that it is critical to get that supply physically connected into Ontario. The pipeline still has to go through regulatory approval process in the US, but it's clearly a project we think is good for Ontario and our consumers.

"OUR PARENT COMPANY IS PLANNING A NEW PROJECT TO MOVE MARCELLUS GAS TO ONTARIO AS PART OF THE NEXUS GAS TRANSMISSION PROJECT."

IBR: What opportunities do you see for Union Gas to grow given the relatively mature nature of the market in Ontario?

Steve: Even though the natural gas market in Ontario is mature, we continue to see a lot of opportunities to grow the company. One, there are still a lot of communities in Ontario that still don't have access to natural gas and instead use other forms of energy and we are working to connect these communities to our system. Further, we are currently going through a number of major expansions to our transmission system to expand natural gas deliveries to Toronto, Eastern Ontario, and Quebec. Additionally, with the competitive price of natural gas relative to other fuels, we believe there are opportunities in compressed natural gas (CNG) and liquefied natural gas (LNG) in the transportation sector.

IBR: Do you think there is substantial market potential for LNG in transportation and what steps need to be taken to convert those vehicles to use LNG instead of diesel?

Steve: The LNG market for transportation is currently in a bit of a chicken-egg dilemma. When we approach transportation companies to discuss the potential of converting their diesel vehicles to natural gas or to consider purchasing LNG vehicles, they ask 'where am I going to fill up?' If we build the infrastructure, we then ask the question of whether there will be enough demand to support this new infrastructure. It's a tough market to get going initially. However, the federal government has recently announced some tax incentives in the form of enhanced capital cost allowance for LNG facilities. Those incentives will apply to both LNG facilities that will be used to export natural gas from the West Coast as well as LNG facilities that help fuel the domestic transportation sector. That is a very positive step and could help overcome some of the initial inertia in terms of moving the LNG transportation sector forward.

"THE LNG MARKET FOR TRANSPORTATION FOLLOWS A CHICKEN-EGG DILEMMA."

IBR: Given Canada's aging workforce, what challenges or opportunities do you think this poses for Union Gas?

Steve: Clearly we're seeing the impact of the aging workforce, particularly if we look at our field personnel, where the average age is mid-fifties. However, I definitely think that leads to many opportunities in the sector. As an example, we are actively recruiting and training new employees, putting them side-by-side with experienced employees so they are ready to step in and replace them when they choose to retire. In addition, we are actively looking to expand our workforce by recruiting directly from colleges and universities in order to support our growth plans. Currently, we provide opportunities for engineers to get their P. Eng designation and accountants to get their Certified Accounting designations while working at Union Gas. These new employees are the future leaders of the company and we are proactively planning for the future.

IBR: Do you think we can rely on the Canadian government to help impose programs to improve energy literacy through the education system? If not, what do energy companies need to do to encourage proper discussion?

Steve: I don't think we can rely solely on government to do all that education for us. I think the government can play a role through partnering with industry and academic institutions to develop a better curriculum that can be extended into our school system at various grades. However, it will be the responsibility of the industry to facilitate that discussion. It starts by having our employees educating their kids about the energy sector and how energy is used to produce many of the products that we use and are part of our everyday lives, how energy is used and what the energy sector means for jobs and economic opportunities, I think those are all things that we should do more of.

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Mel Ydreos

IBR talks with Executive Director at EnergyVantage about hydraulic fracturing, the controversy regarding environmental impact, and the future for Canada in Natural Gas.

IBR: What is hydraulic fracturing?

Mel: Hydraulic fracturing is a process to extract rich hydrocarbons from deep and impervious shale formations. Shale formations are typically 1-3 km below the surface, and are relatively thin compared to the depth drilled. This requires wells to be first drilled vertically and then drilled horizontally through the shale layer to ensure sufficient yield. However, due to the impervious nature of the formation, microcracks and fissures must be created to access the resource in greater quantities. These microcracks are created by sending pressurized hydraulic fluid into the well. Sand is included in the mixture to act as a proppant that holds the microcracks open, allowing the hydrocarbons to be released to the carrier pipes and then to come to the surface.

IBR: Hydraulic fracturing has been practiced since 1949. Why is it only recently that it has harboured so much negative media attention?

Mel: The process has changed significantly since 1949; there is a difference between traditional fracturing and modern-day hydraulic fracturing. Although we have been fracturing for a long time, the process of using water to act as the medium to fracture the formation only started in the mid 90s. Drilling the vertical part of a well is something we have done for over 100 years. It's the amount of water, the additives in the water, and the way that we treat the backflow that has created the controversy.

IBR: Given that the concerns are largely environmental, is the banning of hydraulic fracturing in countries like France vindicated?

Mel: A moratorium or a ban is the worst way for governments and policy-makers to assess their options in respect to extraction, because it immediately sets up winners and losers. In jurisdictions where there haven't been many experiences in the extraction of hydrocarbons, studies need to be undertaken and regulatory constructs need to be developed regarding fracking. I firmly believe that the extraction of shale gas can be done safely and with the utmost respect to the environment. However, the infrastructure needs to be there, with the right policy

Mel Ydreos
Executive Director, EnergyVantage

Menelaos Ydreos is the Executive Director of EnergyVantage, a consulting firm specializing in supporting transformational energy solutions, and the Interim President and CEO of the Ontario Energy Association. Mel's Areas of specialization include global energy policy and strategy, organizational cultural, and revenue and cost transformation. Prior to EnergyVantage, he led Union Gas' government, municipal and aboriginal affairs activities and held positions including VP Operations, VP Marketing and Customer Care, and VP Engineering and Gas Supply Operations.

Mel is an active leader in the natural gas industry through the International Gas Union, as the Founding Chair of Energy Technology and Innovation Canada, a member of Pollution Probe's Board of Directors and a member of the Advisory Committee of the Mowat Centre's Energy Fellow. He is also the past chair of the Standing Committee on Operations for the Canadian Gas Association, and has served on the board of directors of Canadian Standards International and the Canadian Standards Association Group.

Mel graduated from the University of Waterloo with a degree in civil engineering.

About EnergyVantage

EnergyVantage is a boutique consulting firm that specializes transformational thinking for energy businesses. EnergyVantage's core services focus on organization transformation, high performance leadership, global advocacy, and strategic advice. The business is headquartered in Toronto, Canada.

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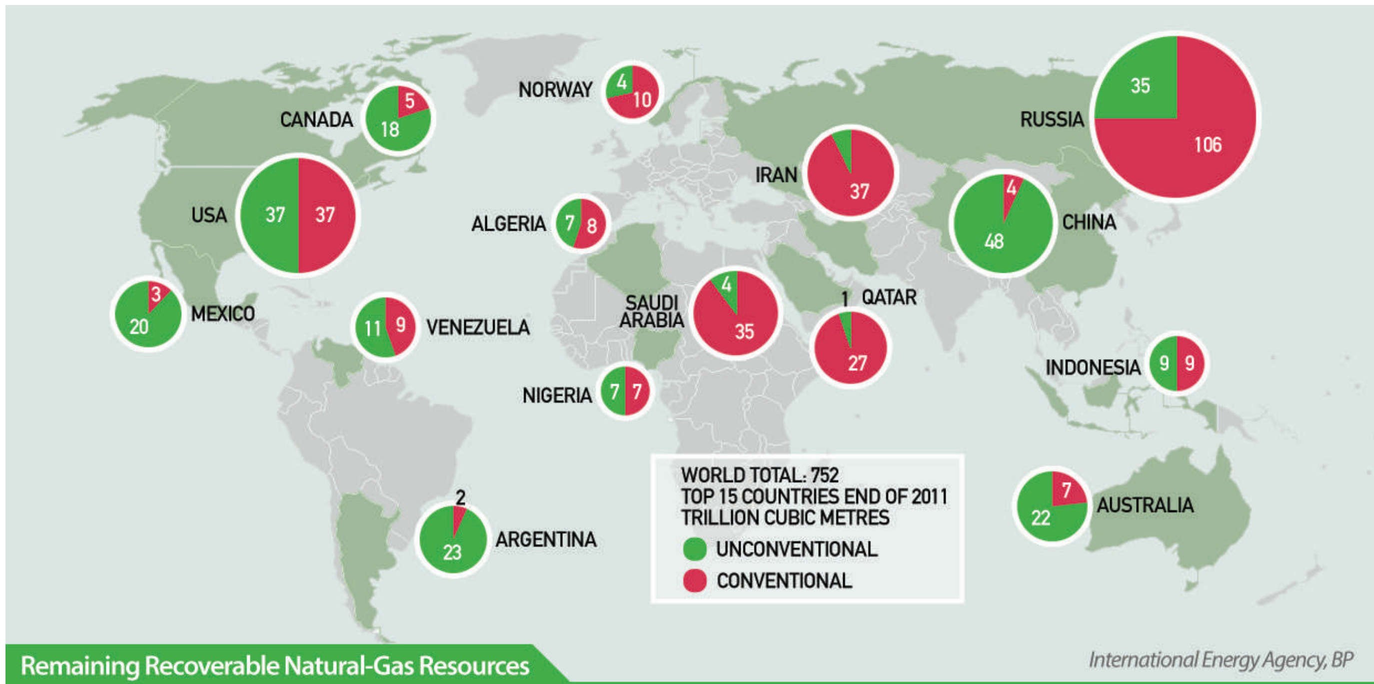

Remaining Recoverable Natural-Gas Resources

and oversight, and only then can the resource be extracted efficiently.

"A MORATORIUM OR A BAN IS THE WORST WAY FOR GOVERNMENTS AND POLICY-MAKERS TO ASSESS THEIR OPTIONS IN RESPECT TO EXTRACTION."

IBR: Are the horror stories in which homeowners blame fracking for flammable water and poisoned livestock merited?

Mel: There has been a lot of sensationalism raised by the opposition, which has been largely debunked. For example, many claims made in the documentary 'Gasland' have been proven false by EnergyInDepth; a research, education, and public outreach campaign created by the Independent Petroleum Association of America. Regardless, these perfidious claims have created public unease surrounding the safety of fracking. I can tell you there are no documented cases where there has been aquifer contamination from hydraulic fracturing. I can tell that even though there are no documented cases where there has been acquifer contamination from the hydraulic fracturing process, in some very rare cases, methane from poorly constructed well casings has migrated to near by water wells. With the innovations in technology, those extreme circumstances can be quickly rectified.

There are much better practices now that confirms the lack of adverse environmental impact. This includes the testing of water wells before the hydraulic fracturing begins, during the process, and after it has been completed. This provides projects with a baseline to monitor against and allows us to clearly ascertain the validity of environmental impact claims, or if there were preconditions that existed before hydraulic fracturing started in the area.

"THERE ARE NO DOCUMENTED CASES WHERE THERE HAS BEEN ACQUIFER CONTAMINATION FROM THE HYDRAULIC FRACTURING PROCESS"

IBR: How do you think fracking can better communicate the reality of its operations and rehabilitate its public image?

Mel: As an industry, we need to take responsibility and accountability of public communication. Transparency is very important, which has not been done properly in the past. One such example is the disclosure of the ingredients of the hydraulic fracturing fluid. There are both voluntary and mandatory disclosure requirements in many places that are conducting hydraulic fracturing, where a resident can go online, select a specific well, and download a PDF of the composition of the hydraulic fracturing fluid. The industry needs to do a better job at proactively educating citizens and demonstrating transparency, which should improve public image.

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"THE INDUSTRY NEEDS TO DO A BETTER JOB AT PROACTIVELY EDUCATING CITIZENS AND DEMONSTRATING TRANSPARENCY"

IBR: Many of the chemicals in fracking fluids are known carcinogens, and other chemicals of which people are agnostic to their familiar applications. Would disclosing ingredients actually help in all cases or potentially create more fear due to ignorance of the process?

Mel: Transparency is still the first step to improving social acceptance, as many people are unware that the chemicals used in the hydraulic fracturing fluid (typically 8-12) are in very small concentrations. Standards exist that define the levels of concentration that are acceptable and safe for use. For example, where I reside, a lot of the older water service lines in Toronto are made of lead, and the city has established safe levels of lead concentration in its drinking water, which is continually monitored. Despite all of this, the industry continues to innovate and move towards green completion methods, thereby reducing the environmental footprint of the extraction process.

IBR: What are the standard practices for the disposal of fracking fluid, specifically regarding safety and reducing environmental impact?

Mel: One of the greatest untold stories with respect to hydraulic fracturing and the procedure is the tremendous technological innovation that has occurred and continues to occur. There has been significant innovation in the area of how we handle the backflow in terms of recycling. Backflow released from one well is recycled for use in the next fracturing project, which is becoming a standard practice. Continued focus on innovation in recycling and treating of the fluid will ensure ensure less impact on water sources.

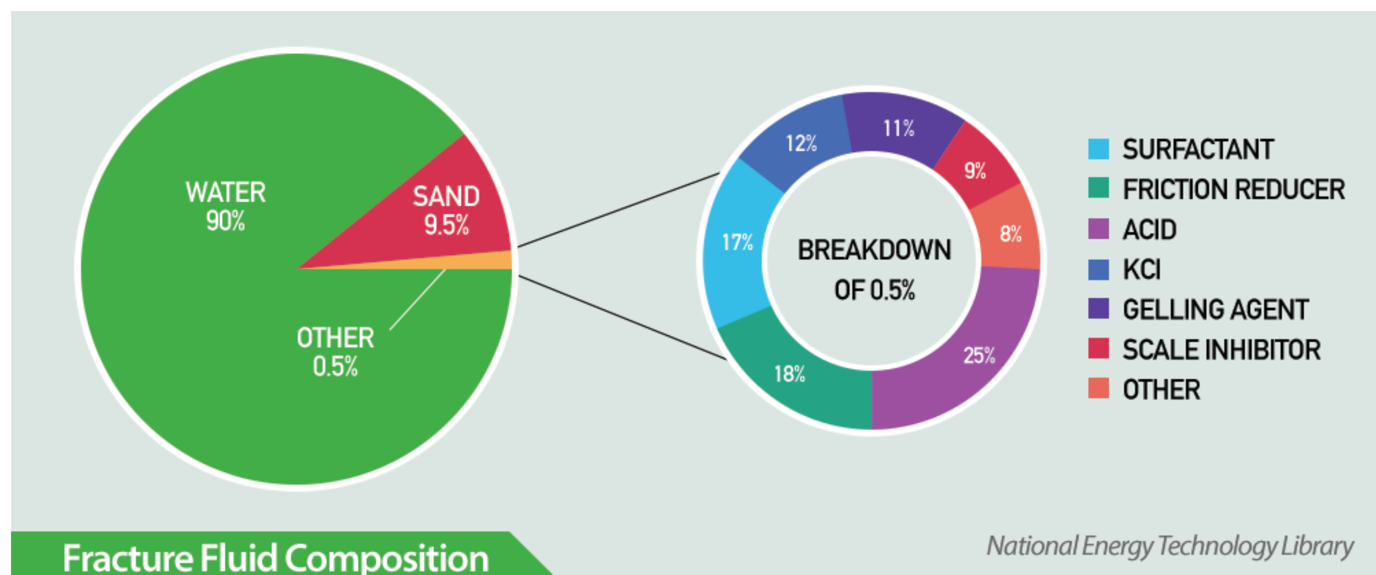
"BACKFLOW RELEASED FROM ONE WELL IS RECYCLED FOR USE IN THE NEXT FRACTURING PROJECT, WHICH IS BECOMING A STANDARD PRACTICE."

IBR: While water recycling requires less fresh water to be used in future projects, is there a long term environmental concern that the water will be permanently removed from the ecosystem?

Mel: While that is correct, it needs to be contextualized. The amount of water being used on an energy extraction equivalency basis is very small. Also, in the Marcellus, the industry is treating water from contaminated coal-mine sites that is technically not considered water in the ecosystem. Piping this water for use in hydraulic fracturing further reduces the impact on an ecosystem's water supply. In another example, in Northern BC, city waste water is treated and piped to the hydraulic fracturing sites.

IBR: Is potential environmental impact the cost of doing business in natural gas fracking? Is there any way the government can step up to decrease the impact?

Mel: I disagree that there is potential for extensive environmental impact. However, incidents will occur. Gas and oil fracturing is an industrial process, and just like in any industrial process, we attempt by design to mitigate risk. However, with all risk mitigation, there could be things that we didn't think of, and both human



Fracture Fluid Composition

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error and material defects can create issues. In terms of shale gas extraction, I am comforted by the fact that we are able to rapidly respond in the event of an incident.

"THE AMOUNT OF WATER BEING USED ON AN ENERGY EXTRACTION EQUIVALENCY BASIS IS VERY SMALL."

Governments need to impose regulations that address the way that we design and construct well casings. This is one of the most critical issues, because if there is any contamination, it will likely be through the well casing and nowhere else. Regulations that force companies to innovate materials, cementing procedures, and well logging to ensure the integrity of the casing is very important.

IBR: Canada has the 5th largest technically recoverable shale gas reserve in the world. What role do you see Canada playing in the global natural gas market?

Mel: We are blessed with great formations and plentiful resources. However, we are challenged with a very small population, so our resources are way beyond what we need or can consume. Therefore, Canada needs to find markets to export to. The US Shale Revolution further exasperates this problem. The US used to be our only market, but is now less in need of our resources. Canada will be forced to expand to new markets.

Asia is the most lucrative market due to the pricing regime of the resource. To access this market, we need to build the infrastructure, including liquefaction facilities, pipelines, and overseas transportation. These large expenditures require long-term financial commitments, especially considering much of the infrastructure is still greenfield or undeveloped. The federal government and the provincial governments are very supportive of this development. However, in order for development to be sustainable, we need indexed prices that are commensurate to the high investment costs and risk undertaken.

IBR: Do you you see Natural Gas pipelines having less or similar opposition compared to oil pipelines in Canada?

"GAS AND OIL FRACTURING IS AN INDUSTRIAL PROCESS, AND JUST LIKE IN ANY INDUSTRIAL PROCESS, WE ATTEMPT BY DESIGN TO MITIGATE RISK."

Mel: The pipelines that carry gas to LNG liquefaction facilities transport the gas in a gaseous state and not liquid, which is the major difference between piped gas and piped oil. Therefore, damage to the pipe results in the natural gas venting to the atmosphere versus leaking the liquid to the ground. This is one of the reasons they have more support, as they have less ability to create immediate local impacts on the environment.

IBR: Do you think that the lower oil price, as well as the lower natural gas price, played a role in the development of shale gas internationally?

Mel: The current oil price situation has certainly affected the energy industry, regardless of if its oil, oil extraction, or gas. Companies globally are reducing CapEx by at least 20%, in many cases 40%, of their intended CapEx. In addition, weak demand due economic uncertainties around the world is limiting development.

"THE CURRENT OIL PRICE SITUATION HAS CERTAINLY AFFECTED THE ENERGY INDUSTRY, REGARDLESS OF IF ITS OIL, OIL EXTRACTION, OR GAS."

This dip may last longer than many expect, but considering population growth and future energy demands, there is no doubt that prices will rebound. We will need more resources, and the price will rise to the point where we will be able to once again make the significant capital investments that are needed to ensure that we have adequate supplies for the future.

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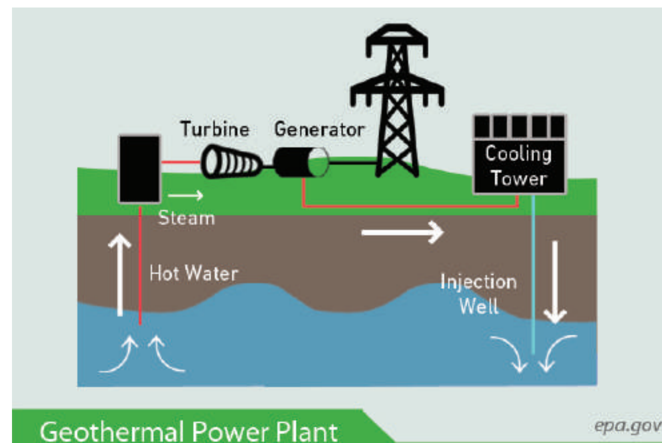
STEAMY INVESTMENTS IN BRITISH COLUMBIA

Partnering with pipeline companies can unlock the potential of geothermal power

Robby O'Brien

Geothermal power is a sustainable, environmentally friendly source of electricity created by harnessing the Earth's naturally occurring heat deep underground. The US is the global leader in installed commercial geothermal power capacity, representing nearly 30% of worldwide capacity. Moreover, 97% of US installed capacity is in the western states of California, Nevada, and Oregon, which share the geology of the North American Cordillera with British Columbia and the Yukon. Although Canada power companies already operate geothermal power plants internationally, there are no geothermal power plants in Canada. The Canadian Geothermal Energy Association (CanGEA), a collective interest group, suggested that as many as 27% of US projects have Canadian companies involved. Given that the technology is proven, and that Canadian companies are experienced owners and operators, it is surprising that geothermal power generation has not yet come north of the 49th parallel.

Borealis GeoPower (Borealis) is a Canadian company working to build Canada's first geothermal power plant. The company has two active projects in British Columbia (BC): one at Lakelse Lake and another at Canoe Reach. The company is currently undercapitalized and lacks the internal capabilities necessary for successful project development, such as capital budgeting, legal counsel, and procurement. As its Canoe Reach project transitions from resource characterization to project development, Borealis should seek a joint venture with a larger partner who has the capabilities that Borealis is missing. Borealis needs to act quickly however, because the window of opportunity for gaining the right partner is closing.



Pillars for Success

Developing a geothermal project in Canada is highly risky and expensive, as the resource potential has been largely unexplored. Successful geothermal projects depend on three pillars of development; geotechnical resources and expertise, financing, and stakeholder acceptance. Industry expert Catherine Hickson emphasizes that "to be successful, a project must bring these three components together in a harmonious fashion." The geothermal project site must have sufficiently accessible terrain and proximity to power transmission lines and power consumers. A feasible geothermal project begins with a relatively inexpensive geological study, which identifies a hot, porous, water bearing rock formation. Once a potential resource has been identified, expensive test wells need to be drilled into the formation to assess the geothermal potential. In perspective,

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a geothermal project has the risks and upfront costs similar to mineral exploration, with the long, steady payback of a utility.

Along with managing resource development and financing throughout the project, developers must also gain stakeholder acceptance. Stakeholder acceptance encompasses multiple social and political channels, including local and provincial exploration and drilling opposition, local land-owners, and power purchase agreements (PPAs) from utility companies. Stakeholder acceptance is specifically important for BC energy and infrastructure projects, which typically involve close negotiations with First Nations.

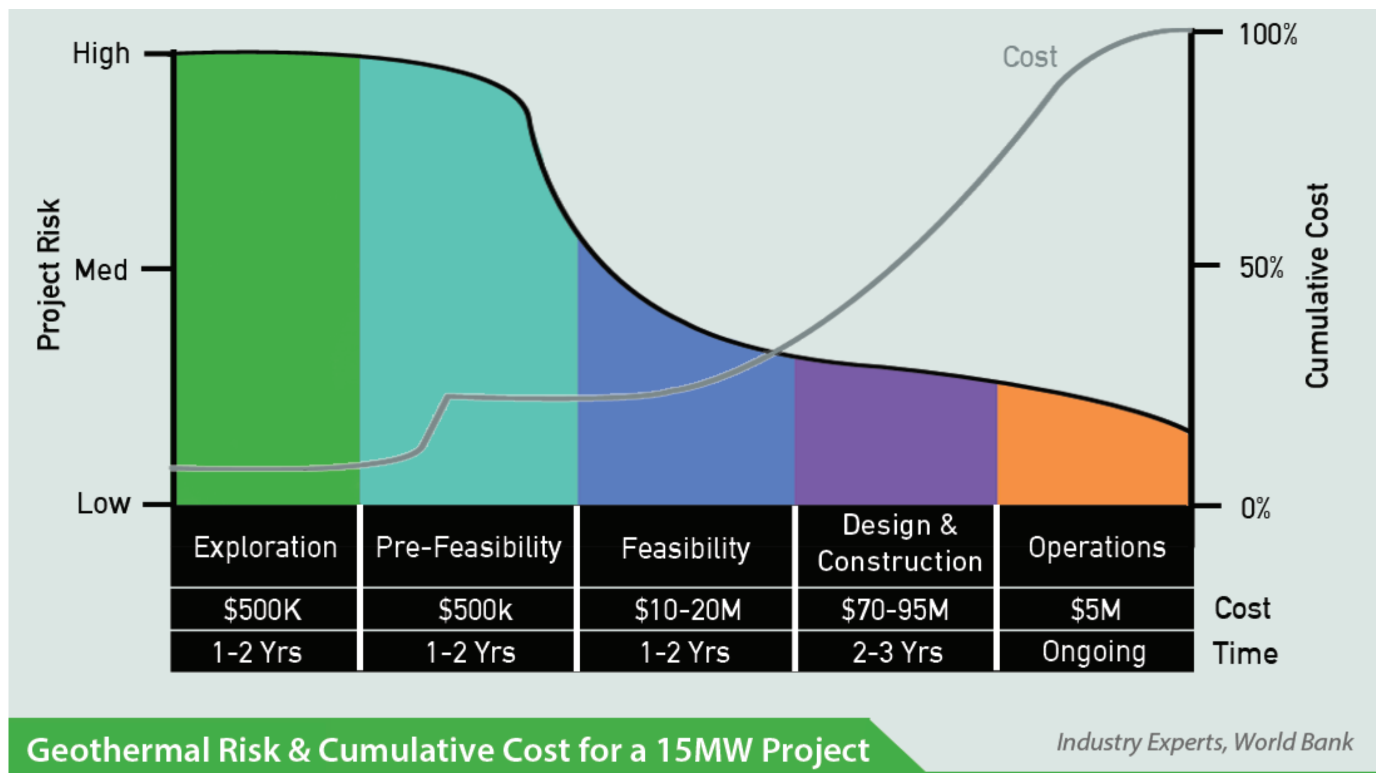
Digging into Borealis

Due to the high up-front capital costs, high risks, and a history of failure, securing capital from traditional equity and debt investors is difficult for geothermal power developers in Canada. Borealis received a $2.4M grant from Sustainable Development Technology Canada in Feburary 2013, and a geothermal exploration permit for the Lakelse Lake area in January 2014. The project is currently planned to enter the pre-feasibility stage in early 2015. Borealis has found success at Lakelse Lake by creating a three-way joint venture between themselves, the Kitselas First Nation (Kitselas), and the oil pipeline company Enbridge. This joint venture, called LL Geothermal, plans to build a 15MW binary cycle power plant south of Terrace, BC.

All of the parties receive different benefits from the partnership. Borealis provides the technological expertise to execute and receives the capital to go ahead with the project. The Kitselas holds land rights for the area, which Borealis now gains access to in addition to lower regulatory scrutiny. The Kitselas gain capital and return for the tribe in an environmentally friendly manner aligned with their core principles. Enbridge is very large compared to the project size (C$50B market cap) and is the primary financier. Enbridge provides Borealis access to its company resources for purchasing, capital budgeting, legal counsel, and brings expertise and relationships from the prior development of the 23 MW Neal Hot Springs power plant in Malheur Country, Oregon, where it performed a similar role as an equity partner to US Geothermal. The Lakelse project is fairly small for Enbridge and appears unrelated to its core business. However, at the same time this project was being initiated, Enbridge was trying to gain federal approval of the Northern Gateway pipeline project and was up against significant local and First Nations opposition.

The Northern Gateway pipeline is proposed to run very close to the Lakelse Lake site, and earning the approval of coastal communities and First Nations groups are key for this pipeline's success. Building pipelines requires extensive consultation and negotiation with several First Nations groups along the route. Enbridge has had bad relations with area First Nations groups in the recent past. By co-investing with a prominent local First Nation band, the Kitselas, Enbridge was probably hoping to repair its tarnished image in the area. Three months after Enbridge announced its joint venture with Borealis, the federal government approved the Northern Gateway pipeline.

The Canoe Reach project for a 15 MW plant south of Valemount, BC is at a similar stage in development as the Lakelse project, and will also enter pre-feasibility study in early 2015. With the right partners, Borealis could replicate the success of its Lakelse Lake JV at Canoe Reach. The Simpcw First Nation currently own the land rights in Canoe Reach and would make



Geothermal Risk & Cumulative Cost for a 15MW Project

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an appropriate First Nations partner, but still need to find a large equity partner. Due to the distance from the Northern Gateway proposed pipeline, another partnership with Enbridge is unlikely. Fortunately for Borealis, there is a different proposed oil pipeline near the Canoe Reach project – Kinder Morgan's Trans Mountain Expansion.

Finding a Kindred Spirit

Trans Mountain Pipeline

Kinder Morgan is a large company with similar capabilities as Enbridge ($85B market cap), has large liquid capital reserves, and is used to investing in energy infrastructure. Though Kinder Morgan has not made investments in renewable energy before, renewable energy development is similar in nature to the pipelines Kinder Morgan has experience investing in and in this case would complement an important pipeline expansion project. The company's proposal to expand the Trans Mountain pipeline by about 200% currently stands before Canada's National Energy Board (NEB). This pipeline expansion would generate an additional $720M in revenue per year. Moreover, the expansion represents about one-third of Kinder Morgan's proposed total capital investment, so it's important for Kinder Morgan to see its expansion get approved. A partnership with Borealis and local First Nations in a renewable energy joint venture represents a small investment that can only help Kinder Morgan get approval for its pipeline project.

Investment Benefits

The NEB plans to make a decision on the Trans Mountain Expansion in January 2016, leaving Borealis little time to get a deal done with Kinder Morgan. The likely more impactful benefit to Kinder Morgan is the relationship with the First Nations population. Company President Ian Anderson has reiterated the importance of First Nations relations to the pipeline's success in recent press releases. Borealis has already gained a permit to conduct geotechnical exploration of the area, which indicates a strong existing relationship with Simpcw, making the facilitation of a partnership likely. By partnering with Simpcw and Borealis, Kinder Morgan has a similar opportunity as the Enbridge deal to materially expand its First Nations relations. As a member of the Union of British Columbia Indian Chiefs, Simpcw has a voice among other First Nation's peoples in the province and would provide Kinder Morgan with the opportunity to engage in dialogue on how to solve the points of opposition concerning the Trans Mountain project. With backlash from First Nations in Burnaby, more buy-in from neighboring tribes can help alleviate the resistance.

Doing the Deal

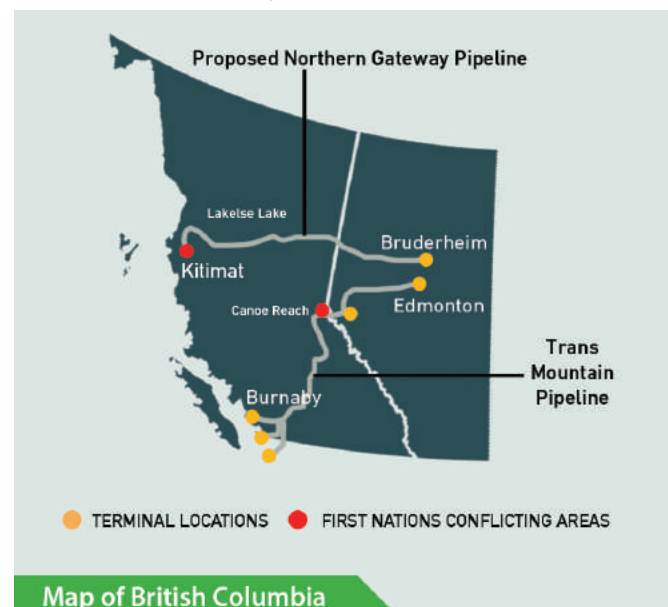
The Canoe Reach project will likely cost $90M-105M in total, of which $2-10M will be needed by mid-2016 to undertake pre-feasibility and feasibility well drilling. The project is likely to take another five years to complete at a minimum. Kinder Morgan should contribute $40M in the venture, retaining a 40% equity stake. Given the 15MW production, assuming a 90% capacity factor and a cash flow of $55 per MWh, the project will earn around $6.5M annually ($2.6M net to Kinder Morgan). This implies a payback of around 15.4 years for the investment.

This is a long payback period compared to Kinder Morgan's other investments; the payback period for the Trans Mountain expansion is only 7.5 years. However, this investment is very small compared to the revenue potential from the Trans Mountain project; $40M represents only 17 operating days of cash flow for the expanded pipeline and a small fraction of its $5.4B investment in the expansion. Therefore any increase in the chance of Trans Mountain approval is well worth the investment in the project.

"A $40M INVESTMENT FROM KINDER MORGAN REPRESENTS ONLY 17 DAYS OF CASH FLOW FOR THE EXPANDED PIPELINE"

Outlook for Geothermal Location

Industry insiders size the total opportunity for geothermal power generation in Canada as magnitudes higher than is likely to be created in the next decade. BC Hydro has estimated the number as high as 700MW, and CanGEA even higher at 5000MW. No matter what the vision is for the industry, geothermal must first prove its viability in Canada to increase investor appetite. Using large capital partners that derive external non-financial benefits from the project, Borealis will be able to reduce its development risk, increase its development capability, and successfully construct Canada's first geothermal power plant.



Map of British Columbia

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A NEW CROP OF INVESTMENTS

Brazilian farmland presents a unique opportunity for The Carlyle Group ‘s next asset class

Max Jaychuk, Nick Xiang

The private equity (PE) landscape is looking for new, long term growth opportunities. PE mega-fund managers such as Carlyle, KKR, and Blackstone now need to compete with their investors such as sovereign wealth funds, state-owned enterprises, pension plans, and large family offices which have become direct investors in the space. While investor appetite has remained high, there has been a buildup of dry powder globally for PE firms due to a shortage of traditional investment opportunities. Global dry-powder reached $1.2T at the end of 2014, an amount not seen since the buyout boom leading up to the financial crisis. The oversupply of capital in the buyout space has pushed up median purchase price EBITDA multiples from 7.8x in 2009, to 11.5x in 2014, the highest it has been in the past fifteen years. This expansion in acquisition multiples has dampened returns from investments in traditional private equity.

Another trend in the PE space is increased investor risk-aversion. This has led to PE firms being pressured by fund managers and investors towards putting capital in high performing assets with a longer hold period than the traditional 3-5 years, along with charging lower fees. The pressure from investors to find quality assets at a low valuation and a longer-term hold has led mega-fund PE firms to shift away from traditional PE to more general asset management, including infrastructure and real estate.

“WHILE INVESTOR APPETITE HAS REMAINED HIGH, THERE HAS BEEN A BUILDUP OF DRY POWDER GLOBALLY FOR PE FIRMS DUE TO A SHORTAGE OF TRADITIONAL INVESTMENT OPPORTUNITIES.”

Surveying the Landscape

One asset class that has remains underinvested is agriculture. In recent years, it has gotten increased attention with the number of private equity food and agriculture funds rising to 47 in 2014, up from only three in 2005. Many opportunities still exist for a PE player looking to diversify its asset mix away from LBOs. Agriculture is an asset characterized by long-term holds, with ample global opportunities and both positive demand and supply fundamentals, which will drive land values. Specifically, farmland provides many benefits. By owning a real asset it increases the safety of principal and gives both income and capital appreciation to owners. Farmland also possesses attractive risk-return characteristics such as returns uncorrelated with traditional investment classes. Additionally, its low cyclicality provides high value retention during recessions. While land prices and weather patterns vary, over the long-term farmland has provided strong returns and is underpinned by growing demand for its production and limited supply of productive arable land. These characteristics align with the fact that the PE industry has been seeking a more stable, reliable income

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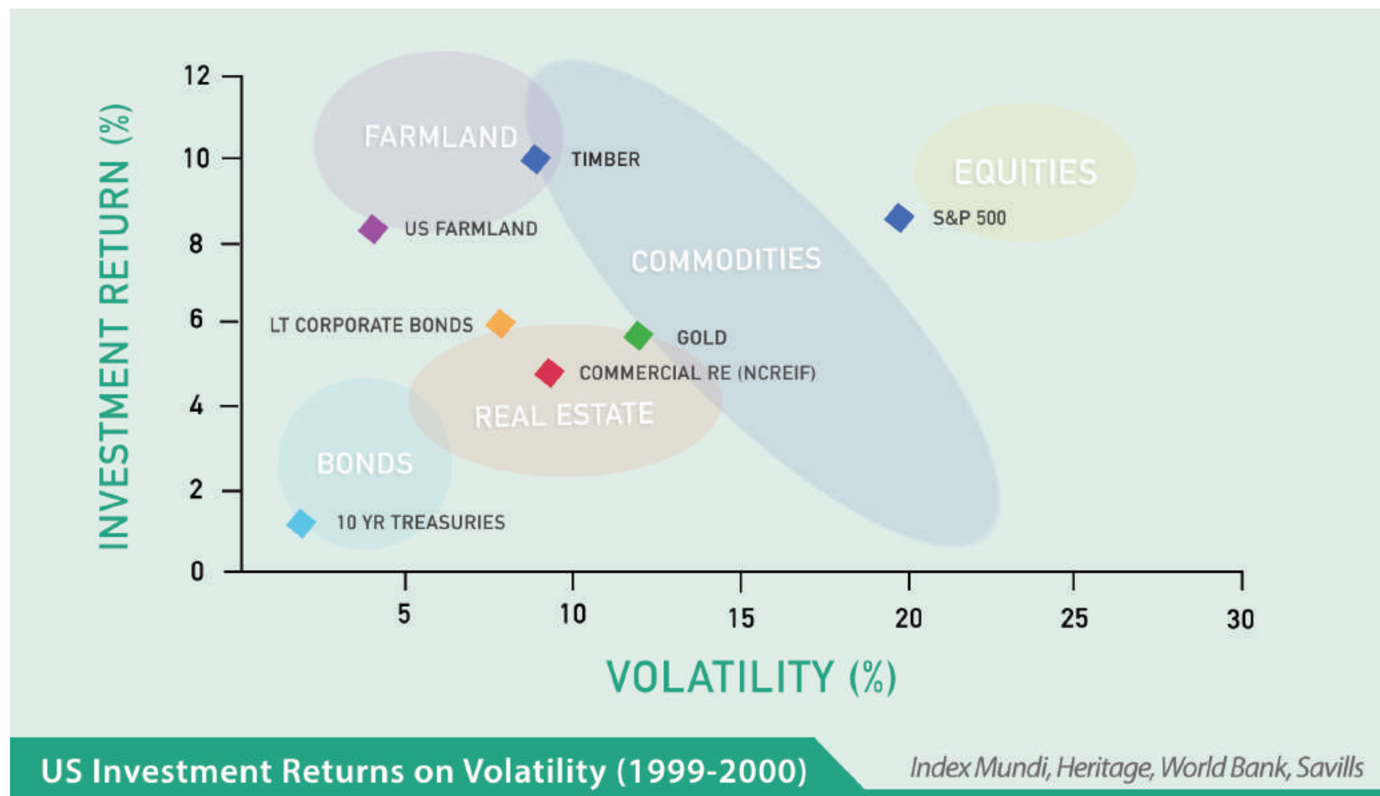

US Investment Returns on Volatility (1999-2000) *Index Mundi, Heritage, World Bank, Savills*

stream compared to other traditional LBO candidates, such as industrial, healthcare, or consumer retail companies. Historically, farmland has been ignored by PE firms as an asset class due to a highly fragmented market, restrictive ownership rules, and its unsuitability to short term hold periods; however, these barriers are decreasing.

Furthermore, the macroeconomic environment will be positive for agriculture over the long-term. The steady growth of the world's population and rising meat consumption, particularly in developing nations, will require a 50% increase in food production by 2050. In addition, after years of crop yield improvements meeting the increases in demand, the yield improvement curve is flattening. Yields are no longer improving on 24-39% of the world's most important cropland areas. The global average projected crop yields are lower than the required 2.4% per year rate of yield gains needed to meet food demand by 2050, necessitating an alternative solution. This presents an opportunity for asset-hungry investors.

"THE GLOBAL AVERAGE PROJECTED CROP YIELDS ARE LOWER THAN THE REQUIRED 2.4% PER YEAR RATE OF YEILD GAINS NEEDED TO MEET FOOD DEMAND BY 2050"

Planting the Seeds

While farmland investing presents attractive characteristics, the potential for stable returns varies significantly across geographies. Climatic conditions, land prices, corruption, and land rights are of utmost importance. North American and European farmlands have presented stable returns to investors over the past 20 years, although these markets are relatively saturated, with high land prices relative to productivity. In contrast, South America remains a relatively undeveloped market with some of the most ideal climatic conditions, suitable for growing crops year around, and has the world's greatest water resources. Brazil, in particular, presents an interesting opportunity due to its relatively strong land ownership rights. Brazilian land receives high levels of rainfall, which makes it some of the world's best farmland. These climatic conditions create a longer growing season that allows for two to three crop rotations per year, compared to North American farms, which are generally limited to one cycle per year.

Although Brazil has seen some farmland appreciation in recent years, agricultural land in many areas of Brazil remains reasonably priced on a productive basis. Brazil also has the added benefit of having ports that can satisfy the demand of African and Asian nations, which are projected to have the largest food supply gap in years to come. Brazil currently has 73M HAs of arable land, with potential for expansion of an additional approximately 100M HAs, 34.3% of the world's total expansion potential. The crop yield for every dollar of land invested in Brazil

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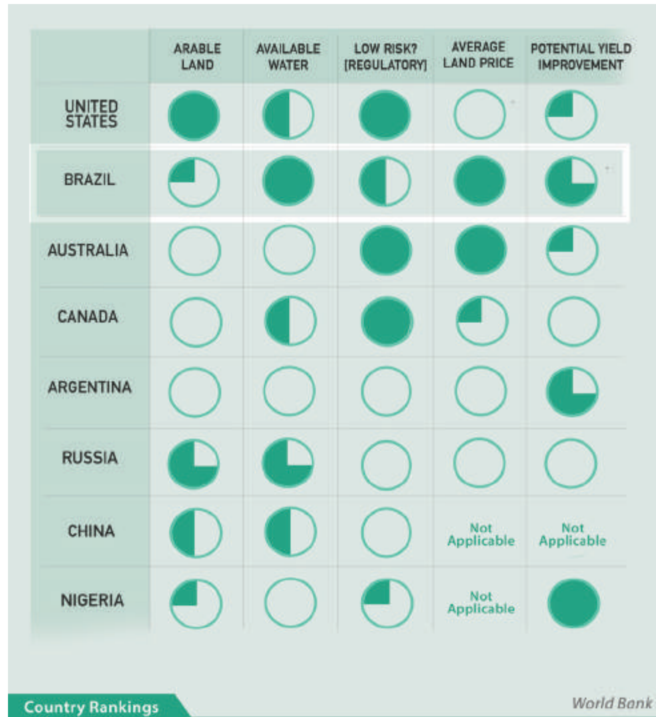

is much higher (1.29 kg/$) than the US (0.67 kg/$). This, along with the fact that Brazil has a cereal crop yield that is only 65% of the US' suggests there is the potential for agronomical improvements and yields converging closer to comparable productive land in the US. Brazil has one of the lowest ratios of cultivated land to suitable land (60%) and achieved yield to potential yield (40%), further proving that Brazilian farmland has potential productive upside.

"BRAZIL CURRENTLY HAS 73 MILLION HECTRES OF ARABLE LAND, WITH POTENTIAL FOR EXPANSION OF AN ADDITIONAL APPROXIMATELY 100 MILLION HECTRES, 34.3% OF THE WORLD'S TOTAL EXPANSION POTENTIAL."

Harvesting the Crop

Many PE funds have been trying to diversify into alternative asset classes; however some, such as Carlyle, have struggled to diversify despite success in the LBO space. To note, 85% of Carlyle's annual net income came from PE, compared to Blackstone (32%) and Apollo (48%). To diversify its business, Carlyle has been funnelling as much as $5B towards a longer-term fund with investment horizons as long as 20 years. This aligns with agriculture's more long-term nature and illustrates why Carlyle could be well-positioned to invest in the agriculture industry.

Relative to the other mega-funds, Carlyle has maintained a strong presence in South America since 2008, with two offices (Peru and Brazil) and over a dozen investment professionals. Although Brazil has been known to have provided some difficulty to foreign investors, Carlyle has had the experience of making several investments in the country over the past few years, demonstrating both its knowledge and willingness to invest in the space. Experience in the region provides Carlyle with an advantage over other large investment firms within Brazil's unique business environment. Carlyle needs an entrance strategy that minimizes risk, while still providing returns in line with the firm's expectations.

To implement this strategy, Carlyle would need to start a new fund, as the existing fund's footprint in South America focuses primarily on LBOs. As Carlyle's current funds are sized between $150M-800M, an agriculture fund with approximately $400M of committed capital for the first fund would match Carlyle's current strategy and is comparable in size to other agriculture funds that have invested in Brazil. The investment horizon would be longer than traditional PE, ranging from 10-15 years.

Agriculture investments can be approached through a landlord model, where farmers pay agreed rents to the investor. This model is low risk, providing investors with only 8-10% return. Alternatively, an operational model where the land owner would operate the land themselves can yield higher returns, but exposes investors to weather, commodity price, and operating risk. However, over the long-term, the effect of these risks could be decreased. The typical land operational strategy would involve purchasing the land, hiring external managers and farmers to manage the land, transforming the land, growing and harvesting the crops, and transporting the product to processors. Carlyle should implement the operational model to expand into Brazilian farmland.

Although Carlyle is known for taking an active investment strategy, the agriculture operational strategy would involve different skills than the typical LBO model that Carlyle is used to. As such, it must form a joint venture with SLC Agricola (SLC), the largest Brazilian local farm operator

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that has experience working with foreign investors. Carlyle would provide the necessary capital and own a 49% stake, in exchange of benefitting from the operational expertise and local market knowledge of SLC, who would own a 51% stake. This would also ensure Carlyle is meeting Brazil's foreign ownership restrictions. SLC is publicly-traded and was founded in 1977, making it a reputable partner that Carlyle could depend upon, minimizing the investment risk. The company's business model is based on large-scale modern production systems and currently operates 16 farms across six Brazilian states, totaling 343,600 HAs, proving that it has the capacity to manage Carlyle's farmland portfolio. SLC also has experience working with foreign investors, as it previously entered into similar partnerships with Valiance and Mitsui. The partnership would work as follows: Carlyle would provide the financing for purchasing the land, equipment, and working capital, while SLC would hire the farmers and use its internal operations team to develop and manage the farmland.

"ALTHOUGH CARLYLE IS KNOWN FOR TAKING AN ACTIVE INVESTMENT STRATEGY, THE AGRICULTURE OPERATIONAL STRATEGY WOULD INVOLVE DIFFERENT SKILLS THAN THE TYPICAL LBO MODEL THAT CARLYLE IS USED TO."

Calculating the Yield

Brazil has approximately 8.4 million sq. km of land, of which 33% is being used for agriculture and 8.7% is arable. Much of this land is Cerrado, or savannah land, which is available in large swaths and has the characteristics to become productive farmland. Carlyle should pursue a Cerrado transformation strategy with SLC in order to maximize returns. Transformation is the process of converting arable land into usable farmland. Capital expenditures for transformation ranges from 40-90% of the land cost, but will add significant value uplift. In addition, where possible, the partnership should work towards consolidating the Cerrado farmland. Economies of scale exist for farming; if Carlyle were to invest in multiple properties, it could consolidate and distribute farming equipment, decreasing operational expenses and boosting its IRR.

Other foreign investors have already proven this model can work logistically with the desired returns, although with limited capital. Valiance, a British asset management firm, launched a joint venture with SLC in 2012 to acquire Cerrado land and develop it into high-performing farmland. It estimated an IRR of 22% through this venture. Similarly, Brookfield Asset Management focused on land transformation through its $330M AgriLand Fund, which manages 220,000 HAs of land. Like Valiance, Brookfield estimates an IRR of 20-25%. These examples show that the desired return is feasible.

Carlyle should invest in Cerrado farmland in the Brazilian states of Mato Grosso and Goias. These farm areas have limited access to suitable infrastructure to transport products to ports, resulting in land prices of $1,000-2,000/HA. These prices are significantly lower than the more saturated regions; top quality farmland in Brazil can be valued as high as $10,000/HA. The Brazilian Government has committed to developing additional transportation infrastructure in the next 10 years near these regions that would reduce transportation and export costs by up to half and have the potential to increase annual income yields by 4-5%. This could also translate into further land appreciation, resulting in a higher valuation upon exit. In order to further boost returns, Carlyle could also propose to the Brazilian government to complete a cash infusion into the infrastructure assets through the company's Global Infrastructure Fund to accelerate construction.

Together, Carlyle and SLC should focus on the transformation and consolidation of large pieces of Cerrado land to maximize efficiency and generate attractive returns. Time is of the essence as the supply of Cerrado land will eventually be eliminated due to infrastructure improvements and increased investor capital. Success in Brazil may lead to Carlyle expanding its agriculture strategy to other parts of South America, globally positioning itself as a leader in the asset class before other PE firms get started.

"TOGETHER, CARLYLE AND SLC SHOULD FOCUS ON THE TRANSFORMATION AND CONSOLIDATION OF LARGE PIECES OF CERRADO LAND TO MAXIMIZE EFFICIENCY AND GENERATE ATTRACTIVE RETURNS."

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TWO MINUTES FOR INTERFERENCE

The profitability of NHL franchises is hurting due to inflexible policies on relocation; teams are officially skating on thin ice

Cameron McDavid, Cole Rodness

The fall of 1993 marked a critical juncture in the history of the National Hockey League (NHL) as commissioner Gary Bettman announced the league's intention to pursue expansion throughout the southern United States. Until this time, the league had not established a strong presence in southern states where hockey was relatively overlooked, and it appeared team owners viewed expanding south as the league's avenue for growth and pervasive recognition. While it is difficult to argue that the popularity of hockey doesn't grow in the presence of an NHL team, Forbes's most recent list of NHL franchises and their respective valuations includes four teams that were formed southern states in the 1990s - Tampa Bay, Arizona, Carolina and Florida - among the bottom five.

Fast forward to 2015 and clearly not all franchises are thriving as intended. Each of these teams reported a net loss in their most recent fiscal year. With a struggling Canadian dollar, NHL revenue forecasts are now even lower than projected a year ago. Owners must have a strong interest in remedying this issue. It is time for the NHL owners and NHL Players Association (NHLPA) to reassess the way they view these franchises and how each interact with the rest of the league to ensure continued growth of the sport and financial success of all participants.

"WITH A STRUGGLING CANADIAN DOLLAR, NHL REVENUE FORECASTS ARE NOW EVEN LOWER THAN PROJECTED A YEAR AGO."

NHL Revenue Sources

The expansion was predicated on the NHL's push to drive TV revenue. The Levitt report, published during the 2004 lockout, offered unprecedented insight into the inner machinations of the NHL's financial landscape. As per this report, TV revenues comprise a much smaller portion of league revenues compared to their main driver, gate admissions. This trend is still prevalent currently. In Canada, the NHL signed a deal with Rogers Communications worth \$5.2B for 12 seasons, or \$433M per year, starting in 2013. In the US, the NHL secured a ten year national TV broadcasting deal with NBC starting in 2011 with an estimated inflow of \$200M per year, bringing the total TV broadcasting revenue to \$633M annually, or 17% of the leagues \$3.7B in total revenue projected for the 2014-2015 season. If compared to figures from the Levitt Report, ticket sale revenue accounts for approximately 53% of NHL revenues, with as much as an additional 21% of revenue being derived from in-arena revenue, such as food sales, advertising, and box seats.

In the short term, TV revenue streams are not particularly important because contracts in the US and Canada are fixed until 2025 and 2021 respectively, leaving gate revenue growth as the only major potential source of growth for the next six years. As a result, getting fans to games is of the utmost importance to NHL owners, as onsite fans are imperative to revenue generation, and in turn, franchise valuation. It is therefore in the best interest of owners to have teams located in the most auspicious place possible. In the 1990s the NHL pursued growth into major southern US cities to grow national

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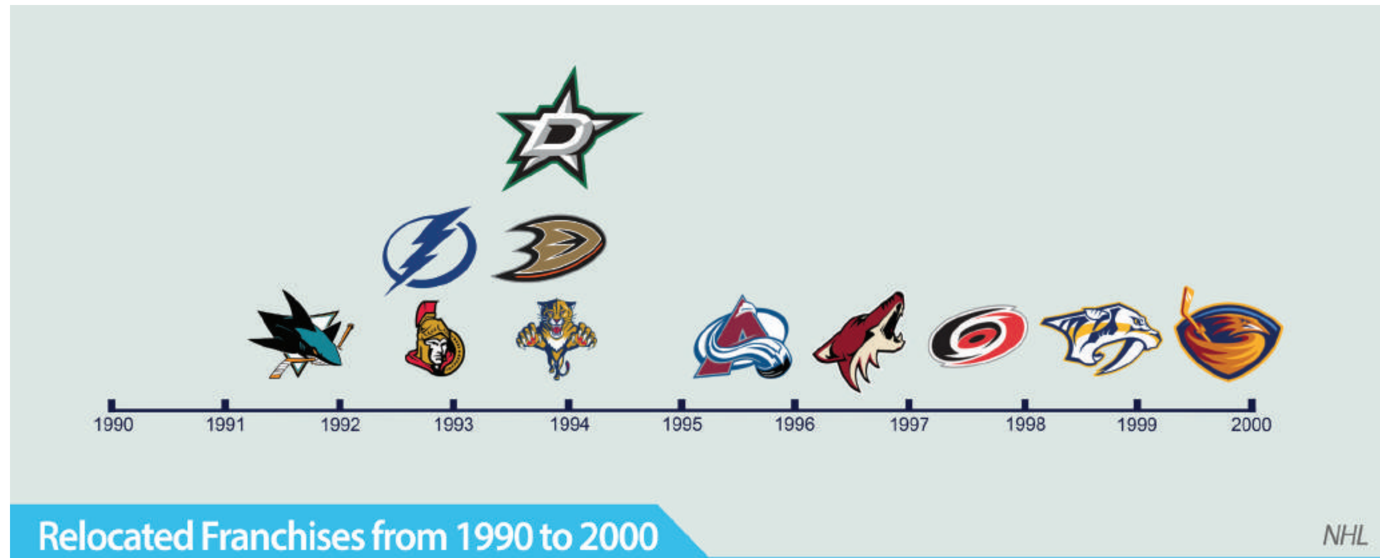

Relocated Franchises from 1990 to 2000

interest in the sport and heighten the value of NHL content to national US TV broadcasters. While this strategy may have been successful in securing a national TV contract in the US and for a few successful franchise, a number of these teams consistently burn through outsized sums of money. There have been several attempts to move these teams to more lucrative geographic markets, but these opportunities are consistently blocked.

"THERE HAVE BEEN SEVERAL ATTEMPTS TO MOVE THESE TEAMS TO MORE LUCRATIVE GEOGRAPHIC MARKETS, BUT THESE OPPORTUNITIES ARE CONSISTENTLY BLOCKED."

NHL Locations

In June 2007, the Canadian Competition Bureau examined the NHL's relocation policies to test for anti-competitive behaviour. Eventually, the Bureau ruled that the league was not at fault, but during the investigation a number of the NHL's relocation policies were brought to light. The investigation revealed that the NHL constitution states that the league cannot relocate a franchise unless there are "extraordinary circumstances" to do so. In addition, move proposals must be approved by 75% of the league's owners, and not occur within seven years of that teams previous move. Lastly, there are territorial restrictions that deny the locating of a franchise within a 50-mile radius of another organization, without the consent of the residing team.

Restrictions on moves are probably intended to preserve rivalries, encourage private parties as well as municipalities to develop infrastructure around a team, and maintain historical territory rights. However, while these effects may be desired, a number of side effects may affect the league in an even more impactful negative fashion. For example, in 2007 Jim Balsillie, the CEO of Blackberry, attempted to move the struggling Phoenix Coyotes to Hamilton, a Canadian city with a strong hockey fan base, but was denied. By denying Balsillie, the NHL essentially denied them a more lucrative financial opportunity. This impacts not only the owner of the Coyotes and Balsillie, but all teams due to NHL revenue sharing agreements.

Share the Puck

In 2012-2013 negotiations, an "industry growth fund" was created as part of Collective Bargaining Agreement (CBA) finalizations. This fund necessitates contributions of $20M annually to the fund, from centrally generated league revenue. When a team is in the bottom quartile of gate revenue generation, it is required to submit a business plan to the league. In the business plan, teams address the steps that it will take to achieve an acceptable level of business performance in future years. If the plan is deemed acceptable, a team is granted money from the fund and expected to follow through on its respective action plans. If objectives are not met, the franchise may lose future eligibility to access the fund.

Alongside the aforementioned fund, the NHL CBA includes a base revenue sharing program, which allocates 6% of total league revenue, primarily away from the top 10 revenue-generating teams, to financially struggling teams. The redistribution is intended to distribute the cost of player's salaries. These athletes only perform at their own arena half the time, and revenue sharing aims to ensure that all NHL franchises are capable of maintaining a payroll equivalent to a league target above the minimum salary floor, and can perform up to NHL standards away from their home rink. The result of this should be that each team has the ability to provide a group of players with salaries fairly similar to other teams without these salaries being responsible for a franchise's poor financial performance. However, this reallocation also acts as a safety net, lessening a team's incentive to increase gate revenues. The gains realized

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by investment to achieve heightened ticket revenue would be partially counteracted by lessened sharing.

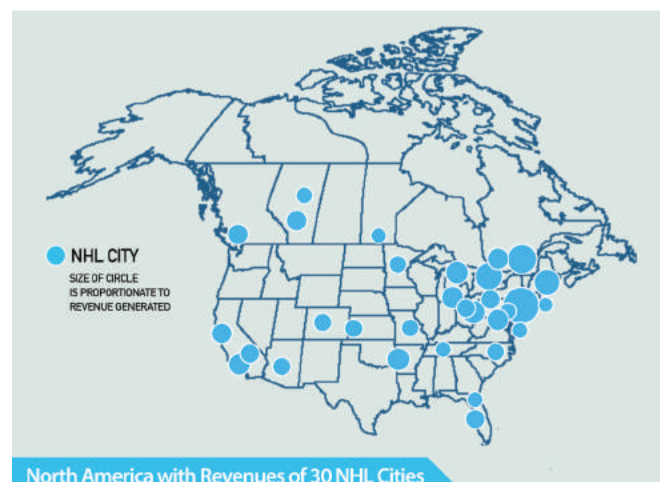
With 50% of revenue generated from the top 10 teams in the league, and a revenue sharing program that pools approximately 15% of total league funds, the bottom performers have less incentive to become financially successful. This structure does not promote competition within the league; owners of wealthier teams subsidize the unprofitable team locations. By limiting relocation opportunities, and providing a financial crutch to underperforming teams, the NHL owners are constricting league revenues.

"WITH 50% OF REVENUE GENERATED FROM THE TOP 10 TEAMS IN THE LEAGUE, AND A REVENUE SHARING PROGRAM THAT POOLS APPROXIMATELY 15% OF TOTAL LEAGUE FUNDS, THE BOTTOM PERFORMERS HAVE LESS INCENTIVE TO BECOME FINANCIALLY SUCCESSFUL."

The NHL, in its apparent attempt to grow TV revenue in order to match other major sports leagues in North America, seems unfocused on developing the most important revenue generator; selling tickets. It has not created an environment that is suitable for a ticket sales centric revenue model. In order to alleviate the struggling teams, it is recommended the NHL owners revisit the NHL constitution and work with the NHLPA to more precisely align the goals of revenue generation and financial success for all teams through future CBA changes.

Changing the Rules

League owners should seek two key changes in the way franchises operate and interact. They should negotiate with the NHLPA to reorganize the revenue sharing program by making a more competitive process for distributing pooled funds. As well, these owners should work with the NHLPA and each other to loosen standards for franchise relocation.



North America with Revenues of 30 NHL Cities

A new process for distributing funds should require the League's bottom earners to submit a business plan similar to the industry growth fund proposal. Instead of receiving a calculated sum as outlined in the CBA, teams must request the funds needed to execute on their plan. The amount of funding provided to the team will be decided based on the quality and feasibility of the proposal. If there are unallocated funds after this process, it will be rellocated back to the top teams. Teams that fail to achieve their actionable steps in their business plan will be subject to review. The review will impose further restrictions and metrics to be met. If the organization fails to meet the conditions once again, the franchise will be ineligible to take part in future profit sharing.

With regards to relocating franchises, the NHL needs to alleviate the restrictions placed on relocation in the collective bargaining agreement. Teams with low fan interest and small populations should be allowed to move to locations with more favourable characteristics. A notable successful relocation was the movement of the Atlanta Flames to Calgary. Instead of requiring 75% of owner buy-in for a relocation decision, this threshold should be reduced to 51% to increase the likelihood of teams moving to the most economically viable locations. The seven-year restriction on relocating a team should still be enforced to prevent detrimental turnover, and provide cities with a fair chance to foster a fan base and make a return on invested infrastructure. Nevertheless, by adopting a less restrictive stance on the economics of team relocation, the league will be able to realize its growth potential in stronger markets, helping owners to move away from poor markets. Due to the increased revenues of these previously underperforming franchise, every owner who contributes money to revenue sharing stands to benefit as they are required to share less.

"TEAMS WITH LOW FAN INTEREST AND SMALL POPULATIONS SHOULD BE ALLOWED TO MOVE TO LOCATIONS WITH MORE FAVOURABLE CHARACTERISTICS."

Final Score

The current policies pertaining to revenue sharing and relocation, while well intentioned, are misguided. Stringent application of relocation rules drag the financial performance of the league as whole. With the adjusted regulations, poor performing teams can move to a better market, higher revenue teams can save on revenue sharing, and owners can receive a share of a now bigger pie. Limiting the efficiency and flexibility of the market is limiting the potential profitability, revenue, and valuation of teams, and ultimately, the league.

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DRAUGHT-ING A NEW PLAN

How Molson Coors can address changing industry trends and keep its business relevant.

Diana Bucuresteanu, Rita Zurbrigg

Macro Suffers

Macro-breweries are facing a crisis. The beer industry, which experienced steady sales growth through the 1980s and 1990s, looks to have a hangover. Shifting consumer preferences towards more sophisticated products has resulted in Big Beer steadily losing market share to innovative craft brewers. Consequently, legacy beer companies such as AB InBev, SABMiller, and Molson Coors have been acquiring regional craft breweries to capitalize on the sub segment's success. Historically, Molson has attempted to inch into the craft brewery segment with the development of Blue Moon in 1995 and the acquisitions of Creemore Springs, Granville Island and Franciscan Well Breweries in 2005, 2009 and 2013, respectively.

Despite this, Molson Coors' volume output is declining at a CAGR of 3% over the last three years which illustrates the company's failure to properly adapt to changing consumer preferences. Moreover, Molson' s CEO, Peter Swinburn, spoke about craft breweries in 2014, stating: "I'm sure the craft owners would say they're not overvalued, […] we have to generate value from any purchase we make, and we find it difficult to get the returns we want." As increasing valuations are beginning to diminish the potential returns of purchased craft brewers - and the company's dependence on the success of relatively few products has overexposed it to emerging threats - Molson Coors will have to develop an organic strategy to begin attracting its previously loyal customers.

Industry

Trends

The Canadian alcohol industry is projected to have a CAGR in sales exceeding 2.5% from 2013-2018. Despite the positive industry outlook, macro-brewers are at risk as consumer preferences shift towards substitute products. Over the past decade, Canadian consumers have shifted their alcohol consumption from beer to wine. Wine consumption per capita has increased over 32%, from 13.2 litres to 17.4 litres, while beer consumption has decreased over 6%, from 83.6 litres to 78 litres. Wine is becoming the drink of choice, threatening the operations of legacy beer producers, like Molson Coors.

"WINE IS BECOMING THE DRINK OF CHOICE, THREATENING THE OPERATIONS OF LEGACY BEER PRODUCERS, LIKE MOLSON COORS."

Consumer Preferences

Increased sophistication of consumer preferences has resulted in a trend towards premium products that offer a tangible or perceived higher quality - a phenomenon called premiumisation. Millennials are beginning to demand diversity and variety in their alcohol choices and are drawn to new products that have distinct, unconventional brands and flavours. Moreover,

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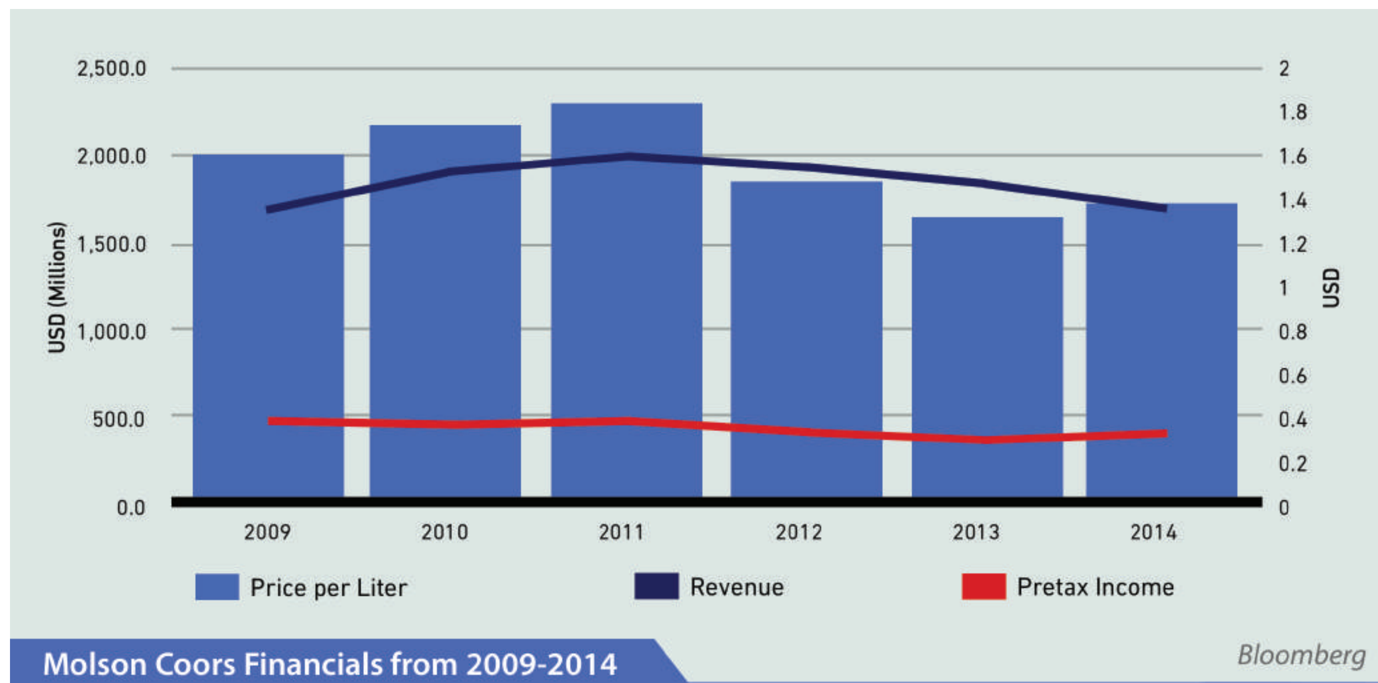

Molson Coors Financials from 2009-2014

changing ethnic make-up of Canadian cities contributed to the popularity of a more diverse product offering across provinces, further segmenting the market. These trends are harming the survival of macro-breweries and have greatly benefited other products, including non-grape wines, imported sakes, whiskeys, and craft breweries.

Regional Differences

The Canadian population is very diverse. This leads to highly variable consumer trends across regions. Different regions vary significantly in their regulation, distribution, and preferences for alcohol. For example, according to Agriculture and Agri-Food Canada, eastern provinces such as Quebec and the Maritimes prefer red wines, where on the West coast, notably British Columbia, white wine is preferred, showing how preferences vary over geography. With beer, this is most notably seen through the proliferation of distilleries in different provinces. British Columbia has notably the largest distillery to population ratio, and is the craft beer center of Canada. They had 66 craft breweries in 2013, representing around 35% of all Canadian craft breweries. It can be seen that Alberta has the biggest deficit in population to distilleries and only has 18 craft breweries (9% of total).

Molson VS Craft

Unlike legacy brewers, craft breweries or "microbreweries" are smaller batched beer producers that offer unique flavours. Of the 191 craft brewers in Canada in 2013, 95% produced less than 15,000 hectolitres, compared to Molson's Canadian capacity of 11.5 M hectolitres. Distinct flavours and unique branding of craft breweries were fundamental to the rapid growth in consumption among discernible millennials. Their focus to developing products with shorter lifecycles has resulted in maintaining consumer interest through internal replacement of products, as customers have been proven to like change. The craft beer market's ability to quickly adjust to consumer preferences due to small batch sizes is expected to triple their current 6% market share in the upcoming future.

Historically, Molson Coors has attempted to enter the craft beer segment through acquiring and integrating external distilleries. Between 2005 and 2009, Molson Coors acquired Creemore Springs and the Granville Island Brewing Company. Furthermore, in 2011, Molson Coors announced the creation of the Six Pints Beer Company – a separate division of the company dedicated to seeding, nurturing, and growing specialty beer brands across Canada. After introducing Granville Island lagers into Ontario, the Six Pints Beer Company launched the Beer Academy, a downtown Toronto based brewpub, to advance the promotion and production of company owned craft beer. Despite early interest, Molson is changing over the Beer Academy to a Creemore Springs brewpub in 2015, illustrating a lack of success in the company's current resource allocation.

Molson's dependence on the success of relatively few products in several mature markets has overexposed the company to possible threats. The company has specifically cited the underperformance in its premium and an economy portfolio as the significant contributors to its volume declines. As consumers are switching to alternative brands more frequently after adopting an initial beer choice, Molson's average consumer lifecycle has been greatly reduced, thereby negatively impacting sales. The company admits to being the victims of their own marketing strategy over the past 10-20 years. Its approach to sell a "lifestyle", wherein the marketing efforts talked about sports and different occasions rather than the product itself, has diminished the firms appeal to maturing drinkers and alienated product conscious consumers away from the Molson brand.

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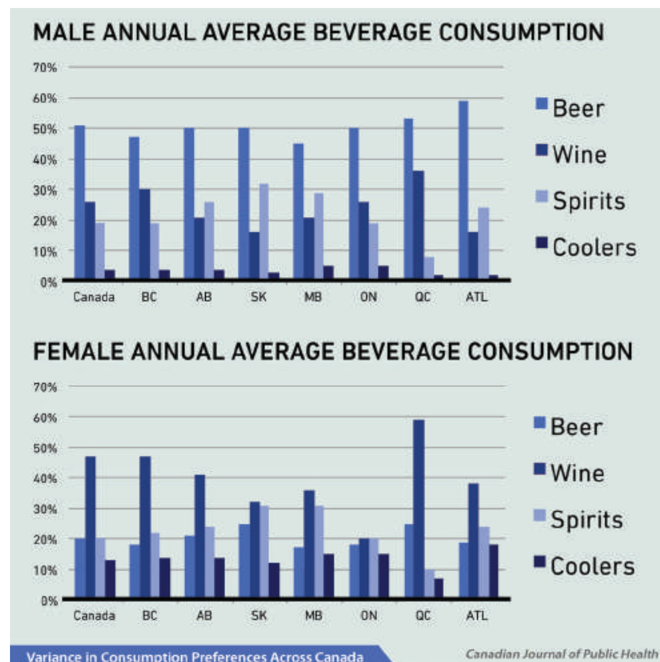
"MOLSON'S DEPENDENCE ON THE SUCCESS OF RELATIVELY FEW PRODUCTS IN SEVERAL MATURE MARKETS HAS OVEREXPOSED THE COMPANY TO POSSIBLE THREATS."

Crafting a Strategy

The perception of Molson's lack of variety and quality is the biggest obstacle in attracting consumers away from microbreweries and other alcoholic drinks. In the past, an effective way to do this would be to acquire small brands to add to their portfolio. But current M&A demand has increased valuations for the most successful microbreweries, making those acquisitions much more expensive. Furthermore, sometimes a highly publicized acquisition of a well-known microbrewery can damage the brand, further destroying the potential value of the acquisition. Instead, Molson should create new micro brands instead of acquiring them to increase its market share in this segment.

Historically, Molson has had previous success competing with craft brewers as exemplified through its internally developed Blue Moon brand. After achieving multiple accolades including the World Beer Championship's Gold Medal, Blue Moon began to receive industry backlash as Molson took the brand across the nation (and eventually internationally). This removes the benefits craft breweries get from the exclusivity, small product cycles, and regional brand presence, no longer capitalizing on the premiumisation of the industry that the initial investment was intending. A similar "acquire and expand" strategy was also used in their acquisitions of Creemore Springs and Granville Island, which both had scaled up production and were expanded nationally.



Variance in Consumption Preferences Across Canada

Instead of "acquiring and expanding" and losing the benefits of a craft brewery investment, Molson should adopt a "true mico-brewery strategy." This strategy entails creating micro-breweries and operating them as a regional autonomous unit. Since craft beer consumers are more loyal to the segment rather than to a specific craft brew, Molson has an opportunity to begin recapturing these previously loyal drinkers, by creating new, short-run "craft" beers in the same format as microbreweries.

To implement this, Molson should create local craft brands in Alberta, B.C., Ontario, and Quebec with already owned craft brewery facilities. These provinces represent over 84% of the total Canadian beer industry and increasing its localized presence in those regions would allow Molson to directly target the most established beer regions. This involves created smaller distilleries separate from Molson's major plants, to allow these craft beers to customize new, unique, and appealing flavours to their respective regions.

Furthermore, by shifting its focus to localized craft brands, Molson could scale back national product launch and begin restoring the firms pricing power. Recently, a number of Molson product launches have been unsuccessful, as it has relied on inadequate consumer understanding before launch. In 2011, the company launched a new brand in the United Kingdom, but discontinued the brand after a year due to unsuccessful consumer adoption. Such failures result in unneeded capacity constraints, manufacturing expenses, and wasted shelve space. Molson has potential to extract more value per volume sold with a regional strategy. From 2009-2014, Molson's net sales per hectolitre declined by 3.3% annually, compared to Big Rock Brewers who experienced a 1.6% CAGR in net sales per hectolitre. This is a metric that can be met and perhaps exceeded by Molson. Given that typical North American craft brewers generate a 48% premium in net sales per hectolitre compared to Molson, the company can generate substantial incremental revenue through shifted product offerings.

A Toast to the Future

Molson Coors longstanding success, which was built on its Canadian heritage, is no longer appealing to consumers. Wine and craft beers offer unique branding and distinct flavours, which Molson has not provided the expected variation. The company needs to address shifting consumer preferences by engaging in the regional charm associated with craft breweries. Decentralizing production allows for new products to be introduced to the corporation's regional portfolios. To successfully produce on a regional level, the organization must utilize their existing craft brewery distilleries, to locally test new products, and develop additional brands on a localized basis. By changing its production strategy, Molson can indirectly enter the craft beer market in a way that maintains the appeal of craft beers while also reacquiring their previously loyal consumers.

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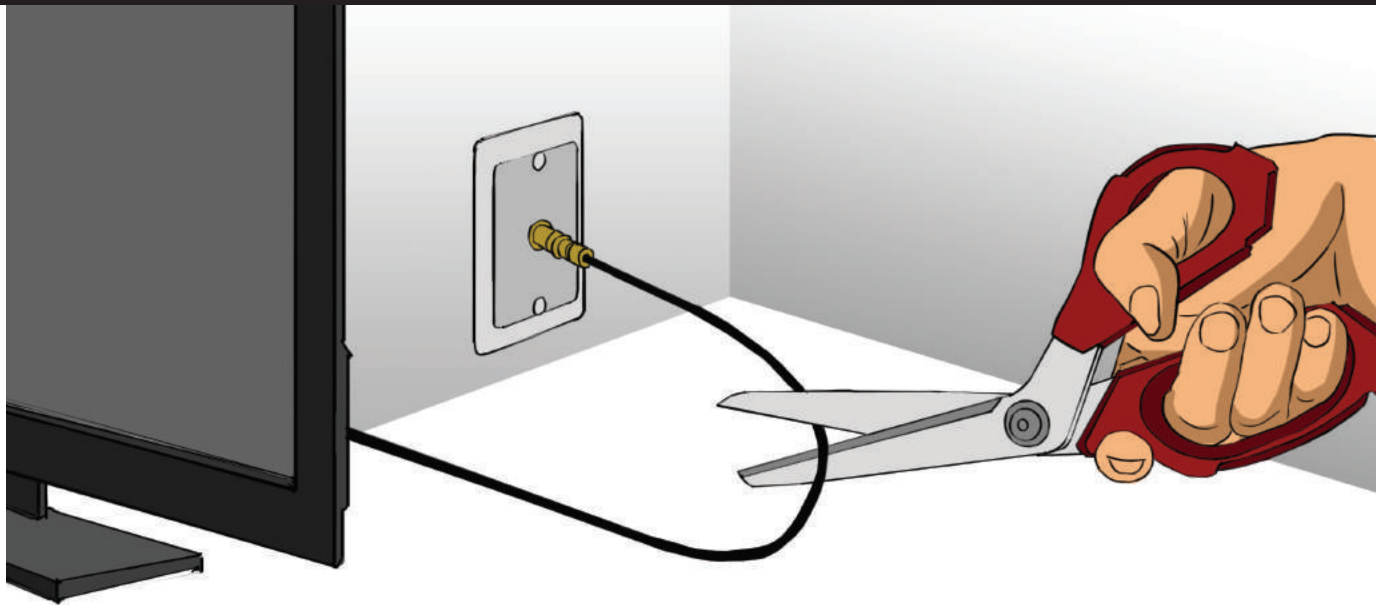

The Next Episode

Rogers and Shaw need to offer Shomi as a differentiated OTT service to all Canadians to expand their respective ecosystems

Russel Shaul, Jonathan Miller

With the increasing popularity of Netflix and other SVOD services, it is clear that the dynamics of the Canadian media sector are in flux. In response to this, Rogers and Shaw collectively launched Shomi in November 2014, a streaming service for movies and television shows. In a similar fashion, Bell Media has launched its own streaming service, CraveTV. Telecommunications companies are seeing consumers leave their ecosystems through the cancellation of their cable services in favour of SVOD services. From 2011-2013, Rogers Communications experienced an exodus of 7% of its cable subscribers, or approximately 170,000 consumers. Additionally, traditional television viewing has stagnated, while the amount of television viewed on the internet has almost doubled from 2011 to 2013. In order to keep consumers in their respective ecosystems, it's evident that communications companies will need to design a service that better caters to the needs and changing consumption patterns of their current clientele. Shomi as a service should be used to access potential customers who are not yet in Rogers's and Shaw's ecosystem so they can incur future benefits, such as reduced customer acquisition cost and the ability to cross-sell higher margin products. If Shomi does not attempt to expand its potential customer base now, Rogers and Shaw are missing out on an ecosystem advantage.

Options for Shomi

In evaluating the options available to Shomi, Rogers and Shaw are faced with two mutually exclusive options. The first option is to protect their current cable business by making Shomi exclusively available to individuals with a cable box subscription. This option would have Shomi function similar to a PayTV service, in which it will only be available to current cable subscribers. Pursuing this option would serve to incentivize existing cable subscribers to continue their cable subscriptions. This is the option that Bell Media has pursued with CraveTV, in conjunction with its satellite offering.

The other option for Shomi is to launch as an open service available to users without cable subscriptions, similar to Netflix's offering. This option would concede that changing consumer trends have mandated that consumers wishing to cancel their cable subscriptions will do so regardless of the availability of a streaming service on their cable box. Shomi would seek to keep users cancelling their cable subscription within the respective ecosystems of Rogers and Shaw.

There has been a lot of speculation regarding potential CRTC regulations for Shomi and CraveTV, as each are restricted to Bell, Rogers, or partnering TV providers. As of March 12th, the CRTC ruled that these services would now be able to avoid a requirement to contribute to Canadian content, if the service was offered to all Canadians over the internet. This was initiated to provide these services equal footing competitively against other unregulated services. Consumers argue that there is a strong chance these rulings will not influence the decision for the services to shift to an "over-the-top" model. Bell has stated that they will be sticking to their current model and Rogers should not follow suit.

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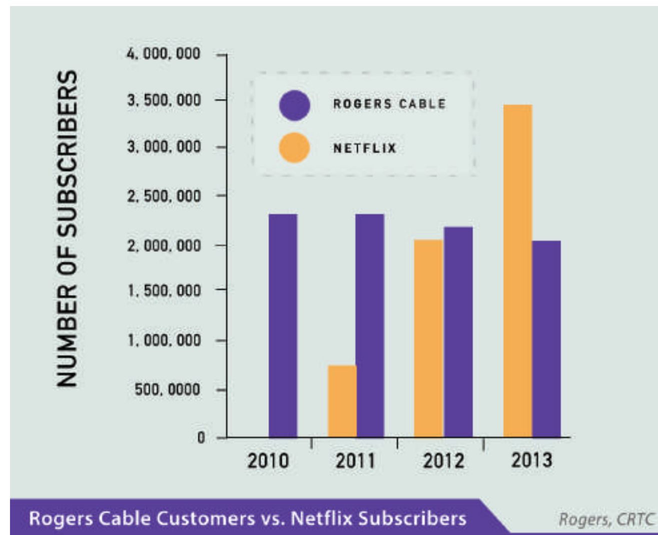

Rogers Cable Customers vs. Netflix Subscribers *Rogers, CRTC*

The Objective of Shomi

In analyzing these two options available to Shomi, it is important to specify the objective that Rogers and Shaw are hoping to achieve through the launch of the service. Given the importance of the ecosystem to their business model, Shomi's primary objective should be to attract consumers to said ecosystems. Therefore, Rogers and Shaw should accept the declining nature of the cable subscription business, and attempt to compensate for this loss of cable subscribers through the scaling of Shomi, providing Rogers with a better foothold in a future telecommunications industry dominated by wireless and internet. By removing as many barriers as possible to subscribing to Shomi, including owning a cable box, Rogers and Shaw can access a larger market to position itself for the future.

Sizing SVOD

Unique content is a critical success factor for SVOD providers, as content is a key driver of consumer choice with respect to specific streaming services. Sixty-three percent of consumers feel that original programming is a key determinant of whether or not they subscribe to a service. This also means that providing high-quality, exclusive content is critical to success in the long run. As of 2013, Netflix has achieved a penetration rate of 29% in Canada, comprising approximately 3.5 million households. Netflix has been successful in offering consumers a wide breadth of quality content at a low price, starting at $7.99/month. CraveTV has a $4 price point, below Netflix and Shomi.

Redesigning Shomi

In designing the Shomi offering, Rogers and Shaw will need to consider where current opportunities exist to provide consumers with additional value when compared to the offerings of current SVOD providers. Additionally, they will need to assess how they can better tailor their product to the consumption patterns of the end consumers. As previously mentioned, content quality is an important component of consumers' decision-making criteria. Shomi should focus on acquiring as much recent U.S. content through licensing as possible in order to build up its content library, which is no longer limited by the percentage of Canadian content required. Canadians tend to rely on recommendations and reviews, and have a preference for American over Canadian produced content. Therefore, in order to legitimize Shomi as a capable SVOD provider, high-quality American content is required to attract and retain customers.

However, even if successful in the acquisition of high quality American produced content, Shomi would still be left with little differentiation between its offering and that of Netflix. These acquisitions would, in the best case, leave Shomi in a case of competitive parity with Netflix, as many streaming contracts are not mutually exclusive, and their content libraries will ultimately not differ significantly. Shomi is more likely to be constantly trying to catch up to Netflix's contracts, network, and model. Imitating, rather than innovating, risks the entire Shomi network.

In order for Shomi to develop an offering that is competitively positioned against Netflix, it must assess the weaknesses in Netflix's current SVOD offering and examine Rogers's core competencies. Currently, Netflix dominates in providing SVOD services to a variety of devices. However, given Rogers's and Shaw's experience in the media industry with multiple divisions, both firms have a competency in many different forms of content. Between the two companies, they have the ability to offer radio, print, and news related content. By integrating these different content types into Shomi, they can make the offering more attractive to mobile users. This would transition Shomi's strategy of offering an exclusively SVOD service into developing a holistic digital media platform.

Shomi Choices

The Shomi platform would ultimately serve as a hub for various media content that is easily accessible to users on a television, computer, or mobile device. The application would offer the user the option to access a specific type of content (video, print, radio, etc.), which would provide a unique interface for each, respectively

What's Next?

As part of its product portfolio, Rogers is a partner in the Next Issue venture, a licensing arrangement with hundreds of the world's most popular magazines on the Next Issue application. Next Issue's business model is similar to that of an SVOD provider, offering unlimited reading of its library of magazines for a monthly fee. According to a survey by MPA – The Association of Magazine Media, 23% of the engagement time by mobile and tablet users is spent reading magazines on their smartphones. By including the Next Issue content library with Shomi's SVOD services, Rogers and Shaw will be able to

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make the service more attractive to mobile users who are likely to already read magazines on their devices. This could lead to cost saving for the customer, through the cancellation of now redundant magazine subscriptions, and would help Shomi to offer a diversified content portfolio to its SVOD competitors.

"THE SHOMI PLATFORM WOULD ULTIMATELY SERVE AS A HUB FOR VARIOUS MEDIA CONTENT THAT IS EASILY ACCESSIBLE TO USERS ON A TELEVISION, COMPUTER, OR MOBILE DEVICE."

However, Rogers is only a partner in the Next Issue venture, meaning it would still be necessary for them to create an arrangement regarding the licensing of Next Issue content to Shomi. As of December 2014, Next Issue has attracted more than 150,000 subscribers, but remains unprofitable. Next Issue's offering is currently priced at $9.99/month. By creating an all-inclusive digital media platform offering Next Issue subscription, Shomi can upgrade the price of its premium service to $11.99 per customer. For customers who do not subscribe to Next Issue and simply enjoy the SVOD aspect of Shomi, they will be less resistant to a price increase since the difference in price is relatively small, placed at only three dollars above that of Next Issue, and four dollars above Netflix, for a comprehensive premium service.

Since licensing businesses are characterized by high fixed costs and low marginal costs per user acquisition, scale is therefore extremely important for Next Issue. As a premium service at the price of $11.99/person, if Shomi is able to penetrate 10% of the market, which is very modest compared to Netflix's Canadian penetration, then 5% of Shomi revenues would have to be passed on to Next Issue in the event of 50% cannibalism of the current subscriber base. The required transferred Shomi revenues significantly decreases with market penetration. Due to the probability of negative profit margins from content acquisition in its early life and a goal to pull consumers to the ecosystem with a convenient one-stop shop for entertainment, Shomi should be willing to take the initial loss to bring people to the Rogers network.

Radio of Tomorrow

Additionally, both Rogers and Shaw have several radio stations in their portfolio from across the country, including CHFI-FM and CITI-FM. Rogers and Shaw would be able to provide Shomi users with the ability to access all of these radio stations remotely through their mobile devices, thus making it easier to stream music, talk radio, and the news on their devices. Stations would be accessed using the same interface and compete only on content. Seventeen percent of cellphone owners have streamed radio through their mobile device, further showcasing that this concept would be well received by Shomi consumers, and help to expand the services offering to mobile users. This will be an ideal medium between video streaming and digital magazines; providing passive listening media for consumers unwilling or unable to access the former at a certain point in time, ensuring consistent involvement in the ecosystem.

A Hook

Finally, Rogers can also offer arguably its most valuable product of GameCentre LIVE on the Shomi platform to lure sports lovers into the Rogers ecosystem. The option to access its content would be available on the Shomi application, but only be available to customers who currently subscribe to the service. By exposing Shomi users the option of streaming over 1000 live sports games on a platform they already use, Rogers is increasing the chance that a Shomi user purchases GameCentre LIVE additionally, ultimately providing more value to the customer and keeping them within the Rogers network. Rogers could offer other similar select options in the same manner, being wary to try not to overly upsell new customers for fear of early retreat.

Putting it Together

Rogers and Shaw should look to utilize their wide breadth of valuable content to pivot Shomi into a comprehensive digital media solution. Shomi will be able to provide content that traditional SVOD services will be unable to compete with, while still offering a high quality video streaming service. This will allow Shomi to dominate usage hours from its subscribers, even if they subscribe to multiple SVOD services. By taking advantage of their licensing arrangements from different content sources, Shomi can create a sustainable competitive advantage. The end result will be more users entering the Rogers and Shaw ecosystems, where they can look to cross-sell products, increase revenue, and lower customer acquisition cost in the future. The de-emphasis of a moribund cable business will allow Rogers and Shaw to unlock value both for the end user and their ecosystems.

"SHOMI WILL BE ABLE TO PROVIDE CONTENT THAT TRADITIONAL SVOD SERVICES WILL BE UNABLE TO COMPETE WITH, WHILE STILL OFFERING A HIGH QUALITY VIDEO STREAMING SERVICE."

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ALIBABA: FAILURE TO DELIVER

Alibaba needs to look offline and secure transportation assets to grow into new markets

Jason Cao, Shivum Sharma

In 2014, Alibaba succeeded in hosting the largest IPO by dollars invested, with $25B raised by the company and selling to shareholders. Alibaba priced its IPO at $68 per share, and in late January 2015, these shares were trading at over $100. Since then, Alibaba missed 2014 sales growth expectations by more than 5%, resulting in unfavorable changes in equity research guidance and an approximate 20% decline in share price. To meet expectations moving forward, Alibaba is expected to significantly expand the range of goods sold through its websites to penetrate major areas of consumption spending, such as food and medicine. These two categories represent 40% and 12% of Chinese consumption spending respectively, but less than 3% of current e-commerce sales. Expectations are that 10% of Alibaba's revenue will be derived from the sale of food and medicine by 2018. However, the current logistics strategy is not sufficient to support these expectations, and without a strategic shift, Alibaba will continue to miss future sales targets by an even more alarming amount.

Alibaba & Amazon: A Tale of Two Models

Alibaba and Amazon are the dominant players in their respective markets, while having found success in two different e-commerce models. Alibaba uses a third-party/marketplace (3P) model collecting commission on sales, whereas Amazon operates a direct sales/first party (1P) model. While Amazon tends to collect more revenue per transaction, the limited capital expenditure inherent within the 3P model allows Alibaba to maintain significantly higher margins. In 2014, Alibaba earned a net profit margin of 44.5%, resulting in net profit of $3.8 billion-six times higher than that of Amazon. This disparity reflects the profitability benefits of the 3P model versus the 1P model.

Alibaba avoided tying up cash in inventory and infrastructure, allowing it to create a much more scalable business model compared to one reliant on 1P shipping. In Alibaba's 3P business model, only Internet access, customers, and a shipping address is necessary for geographic expansion. As a result, the company quickly extended availability of a vast number of product categories geographically across China. In contrast, JD.com began offering e-commerce services before Alibaba and a capital-intensive 1P strategy resulted in a much slower expansion. Today, it is only a small fraction of Alibaba's size.

However, the models have reverse superiority on product care. Alibaba's third party logistics strategy gives them limited control over the shipping process, which is operated by separate firms. In contrast, the 1P model allows for complete control of the process, including counterfeit checks, consistently faster delivery times, and a higher degree of handling care by employees. In general, Amazon and JD.com's models allow for higher quality shipping service, and lower chance of damage and counterfeit. These factors are of heightened importance for goods such as food and medicine.

Gross Merchandise Value

Alibaba generates roughly 86% of its revenues from its Chinese operations. Within this space, Taobao serves as the starting point for most buyers; it is a key gateway to the other platforms, registering over 100 M unique visitors daily. Tmall,

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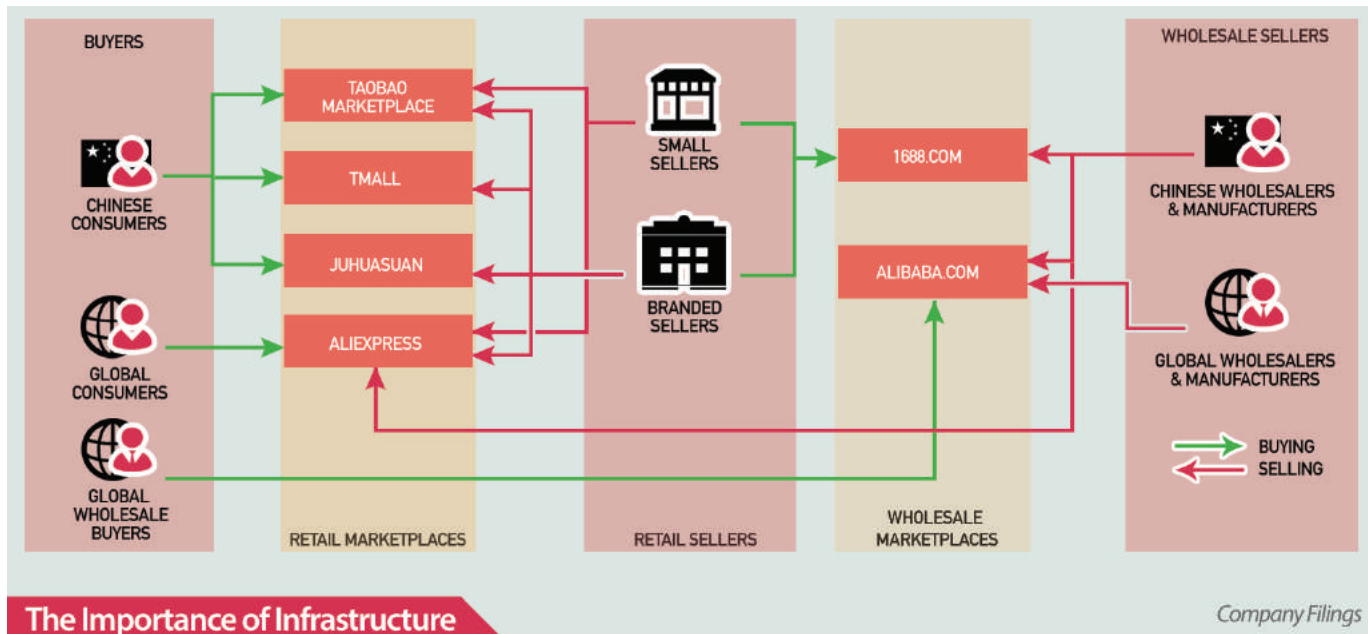

The Importance of Infrastructure

Company Filings

a complimentary platform, leverages Taobao's userbase to drive traffic towards its vetted selection of vendors, for customers seeking higher quality products. Alibaba derives revenue primarily from commissions on sales, advertising revenues, and storefront fees. Altogether, these three streams account for 80% of Alibaba's Chinese revenues. These revenue streams are each, directly or indirectly, dependent on the value of products sold through Alibaba's platforms, also known as gross merchandise value (GMV). As a result, increases in Alibaba revenue are most directly correlated with GMV gains, which continues to be the company's primary goal. The ultimate focus on expansion into food and medicine needs to adhere to increasing GMV.

The Importance of Infrastructure

"Imagine having 30 NBA teams but only a few high school gyms to play in — that was China's logistics infrastructure when e-commerce took off"

–Shen Hayou, chief executive of JD.com

Over the past couple years, Alibaba has been constantly hindered by the distribution network in China. In 2013 alone, there were 410 million cases of e-commerce complaints in China. According to the New York Times, the inefficiencies in the market led to China spending 18% of GDP on logistics, almost three times of the global average. Despite this expenditure, customers still regularly receive packages late or damaged. Further, poor infrastructure has resulted in safety concerns, as mishandled chemical products led to one person being killed, and seven hospitalized in 2013. Altogether, the average Chinese consumer does not expect their package to arrive both on time and undamaged.

In order to counter these issues, Alibaba is investing in China Smart Logistics (CSL). CSL is an ambitious joint venture launched in 2013, aiming to revamp China's logistics system by 2021. With a 48% stake in CSL, Alibaba has chosen to take an "asset-light" approach by not owning any of the physical logistics infrastructure in the venture. Rather, using its competency in big data, Alibaba is focusing on providing the IT infrastructure to the 14 other partners in the joint venture. Essentially supporting Alibaba's 3P model, CSL has the ambitious goal of building a network of key logistics hubs across the nation. CSL is also designed to increase capacity eight fold to 100M packages a day, all delivered within 24 hours of order procurement. However, CSL doesn't explain how it's going to improve the quality of these shipments. Currently, Alibaba has a review system in place, where customers can review sellers, and sellers can review distributers. Despite this system, there has been little improvement; the third parties have not demonstrated any interest in improving their operations and CSL will probably not provide any further incentive.

Another major issue facing Alibaba's empire is the presence of counterfeit products. The Chinese State Administration for Industry and Commerce released a white-paper report in early 2015, claiming that only 36% of the products sold on Alibaba as of July 2014 are authentic. The report also cited that the company ranked poorly for reliability and counterfeit prevention versus other Chinese competitors. The report itself caused a 4% drop in Alibaba's share price, and prompted a class action lawsuit against Alibaba from "misled" investors. All these events occurred despite Alibaba spending over $160M to curb counterfeiting across its networks.

When examining the food industry, one of the largest concerns listed by JPMorgan was a logistics challenge as delivery companies do not have the infrastructure to handle and deliver groceries. Simply put, if Alibaba struggles to deliver clothes undamaged, what hope does it have in selling eggs? Further, when dealing with pharmaceutical products, consumers will not switch their habits to purchasing online if they fear counterfeit

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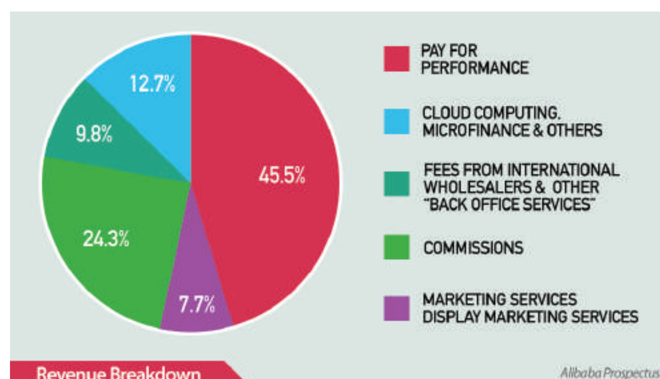
drugs. Overall, Alibaba's 3P model provides little indication that it will be able to support expansion into these categories.

Just-in-Time, Just In Time

CSL alone is insufficient in capturing larger segments of the market. In order to achieve a significant expansion in GMV, Alibaba should adopt a hybrid "Just in Time" (JIT) inventory logistics model on top of its current CSL investment. That is, Alibaba should adopt a 1P system where it holds no inventory, but sources the materials just-in-time to respond to orders, specifically for these new product categories. By using a JIT model with fully owned warehouses, Alibaba is able to capture aspects of both models: improved control over delivery times and increased quality control. All of this can be achieved while maintaining a scalable structure, wide variety of SKUs, and minimal inventory risk, effectively expanding GMV long-term.

Customers will first place their orders through Alibaba's existing platforms, selecting goods from a number of local, vetted sellers, using a process similar to that used by Alibaba's Tmall platform to ensure quality. By limiting the sellers to only those located within a certain radius, Alibaba can better ensure that delivery is made in a timely manner. JP Morgan's data suggests that Alibaba's same city delivery currently takes between 22 and 27 hours on average. If Alibaba were to implement a similar last mile system as JD.com, using its own fleet instead of a third party's, Alibaba should see its average customer delivery times drop 6 hours to align more with JD.com's average. This quicker delivery time will improve customer experience.

Through this model, Alibaba would purchase the products from local sellers and effectively take ownership of the inventory; albeit for a limited time (i.e. a day; hence JIT). During this time, quality check control measures will be taken to ensure authenticity of the products. This check serves a similar role to a customer's eyes in the store, making sure products are not damaged and goods are not obviously counterfeits. Products would be sorted, and then shipped to customers via Alibaba's truck fleet. Altogether, this model will ensure the veracity and quality of the products Alibaba delivers. This would only affect intracity deliveries for food, medicine, and future similar categories to ensure rapid delivery and product care, allowing all other segments to benefit from the CSL investment.



Revenue Breakdown

Alibaba Prospectus

	MARKETPLACE (3P)	DIRECT SALES (1P)
SELECTION	WIDE SELECTION	FEWER CHOICE
INVENTORY	HIGH OPERATING LEVERAGE, LOW RISK	REQUIRES PARALLEL INVENTORY, HIGH RISK
PROFITABILITY	PROFITABLE AND FLEXIBLE	LOW MARGIN
LOGISTICS/ DELIVERY	RELIES ON 3RD PARTY	IN HOUSE WITH STRONG CONTROLS
CAPEX	LIGHT ASSET	HEAVY ASSET
PRICES	RELATIVELY LOWER	RELATIVELY HIGHER
CUSTOMER SERVICE	VARIES ON VENDOR	CONSISTENT
PRODUCT QUALITY	NOT GUARANTEED	GUARANTEED

Model Comparison of 1P and 3P

Deutsche Bank, JP Morgan

Building Up

According to Deutsche Bank, Amazon spends about 2% of its annual GMV on fulfillment related capex, or around $90M to $110M per fulfillment center built annually. The most expensive construction costs in China are approximately 91% of the least expensive construction costs in the US. Using this conservative ratio, the maximum capex for required fulfillment centers in the eight tier-1 cities that Alibaba already has purchased land rights to will be approximately $800M. In addition to this, Alibaba would incur operating expenses related to transportation, quality control, and other warehousing related expenses. JD.com's operating expense related to these costs is approximately 9% of revenue. This figure suggests Alibaba's current net margins of 44% would be reduced to 35% for new product categories shipped through these hybrid warehouses.

At the end of the day, Alibaba has the proceeds from the IPO to fund this project with over $17B in cash. However, with bullish analysts expecting continued growth from Alibaba, failing to deliver in food and pharmaceuticals is not an option. By investing in a JIT model, Alibaba will be able to better control quality and ensure that the product is delivered on time. Rather than failing, Alibaba can begin competing in the food and health care markets – both accounting for over $2.3T in annual consumption by 2018. Given Alibaba's current 2.4% penetration in these industries, this accounts for an incremental $22B in GMV for Alibaba. With a 3% monetization rate and a 35% margin, these industries represent approximately $663M in revenue and $232M in annual profit for Alibaba, paying back the initial incremental investment in less than four years. Most importantly the JIT model allows Alibaba to meet revenue expectations by converting on emerging categories, and will allow Alibaba to grow in the future as these categories expand.

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BEACON & EGGS

With loyalty programs already a staple in the grocery industry, Metro can create further value by engaging with customers through in-store technologies

Vikram Kalia

Following its acquisition of A&P in 2005, Metro Inc. has risen to compete on a national level in the Canadian grocery industry alongside goliaths Loblaws and Sobeys. Metro has recently performed impressively, beating earning expectations in Q3 of 2014. This recent 3.1% income growth, however, was primarily driven by an unsustainable 2.5% price escalation. In parallel, Loblaws's and Sobeys's strategies have focused on inorganic growth, exemplified by their acquisitions of Shopper Drugs Mart and Safeway, respectively. In this consolidating industry, acquisition opportunities have become increasingly exhausted. To grow sustainably, grocery stores must improve customer loyalty, direct spending towards higher margin products, and improve efficiency within the current customer base. The importance of customer loyalty will continue to grow and can be fostered through private label brands and customer loyalty programs. Compared to the two industry leaders, Metro has yet to fully capitalize on the two aforementioned factors.

Private Label Brands

From 2007 to 2012, the Canadian market for private label brands grew at an impressive compound average annual growth rate (CAGR) of 4.1%, compared to the industry CAGR of 2.8%. Total share of Canadian private label brands in the grocery industry reached 18.4%, higher than the global average of 16.5%. Private label brands have proven successful because they provide benefits for both consumers and retailers. Consumers save, on average, 30% on private label products compared to brand names. In addition, private labels typically have higher margins; for example, Safeway makes 25% margins on brand labels compared to 35% for private labels of comparable products. Private labels provide retailers autonomy over pricing and promotion strategies, allowing for flexibility to use pull strategies for attracting and retaining customers. For Metro to grow profits sustainably, it should aim to encourage loyalty to, and through, its private label brands.

"CONSUMERS SAVE, ON AVERAGE, 30% ON PRIVATE LABEL PRODUCTS COMPARED TO BRAND NAMES."

The three major incumbents have all established their own private label brands – Loblaws with President's Choice, Sobeys with Compliments, and Metro with Selections and Irresistibles. Loblaw's brands dominate the private label market, with President's Choice and No Name possessing 67% combined. Loblaws has one of the highest percentages of sales from private label, currently at 27%, significantly higher than Metro's 21%. President's Choice in particular has grown quickly due to its closed ecosystem built around Loblaws's customers, with its assortment of products and services ranging from grocery and household products to financial and mobile services. Alongside mass marketing campaigns, President's Choice's success has been fueled by Loblaws's very effective customer loyalty program – PC Plus.

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Loyalty at Groceries

Loblaws was the first major Canadian grocer to envision a shift towards personalized offerings through their PC Plus rewards program, and is the definitive leader in the space. The PC Plus Points card allows customers to collect points on their purchases, with additional points attached to President's Choice label products. Purchasing data gathered from customers using the card is used to tailor personalized offers, which are sent to them through a mobile application. Since its launch, the program has successfully penetrated more than one third of Canadian households.

In comparison, Metro's loyalty and data collection initiatives severely lacks efficacy. This weakness is evidenced by the My Metro mobile application, which has only a 4.5% adoption rate among its customer base. The application is integrated within their Air Miles rewards program, in which customers earn one reward mile for every $20 spent. Due to conflicts with Sobeys in Quebec, Metro offers a separate loyalty program, metro&moi that offers customers a single point for every $1 spent. metro&moi points are added up every three months and converted to rewards vouchers at a rate of $1 for every 125 points accumulated. Aside from point collection, the application is highly static as it only allows shoppers to input their grocery list, use coupons, and scan barcodes to look for discounts. Customers with Air Miles can integrate their My Metro application with their Air Miles account to receive more personalized promotions; however, this limits those available to receive rewards and the company's potential consumer outreach.

"LOBLAWS WAS THE FIRST MAJOR CANADIAN GROCER TO ENVISION A SHIFT TOWARDS PERSONALIZED OFFERINGS"

Beacons Beckon

Despite PC Plus's ability to use purchasing behaviour to send out personalized offerings, it lacks the ability to track customer habits in-stores. This technology remains largely unused in the grocery industry. This ability to track in-store behaviour comes in the form of Wi-Fi beacon equipment provided by retail analytic companies, such as Toronto-based Turnstyle. Beacon technology uses existing Wi-Fi sources to connect with guests via their smartphones and provides them with instant push notifications. Beacons have several benefits, as they can increase interaction with advertised products by up to 19x and increase in-store app usage by 16.5x.

Wi-Fi beacon technology provides retailers with the ability to create customer profiles consisting of preferences and habits. This knowledge building is accomplished by taking advantage of a smartphone's MAC address, a unique code that devices use as an identifier when connecting with Wi-Fi networks. The MAC represents individuals as they enter and exit the store, allowing retailers to learn how many times an individual has visited, their footpath, and duration of stay.

Grocers can also interact directly with customers within stores via beacons. These retailers can offer guests targeted promotions through their mobile device if customers consent to providing their basic Facebook information in the Terms and Conditions of the Wi-Fi when logging in. The retailer can subsequently curate a promotion based on any data collected. Guests may receive instant promotions and information on their mobile device as they walk in a store if they fall within a campaign's criteria, based on factors such as time of entry, frequency of visits, and demographics.

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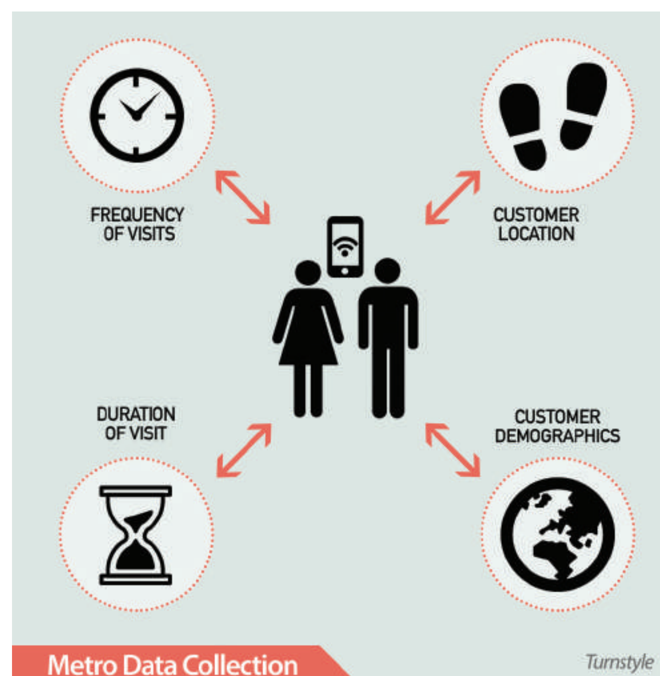
"WI-FI BEACON TECHNOLOGY PROVIDES RETAILERS WITH THE ABILITY TO CREATE CUSTOMER PROFILES CONSISTING OF PREFERENCES AND HABITS."

Becoming a Personal Shopper

With a struggling private label market share and lower gross margins compared to the rest of the grocery industry, Metro is in need of an upgrade. Metro should employ Wi-Fi beacon technology in all retail locations, around which a customer loyalty program can provide offerings that are more sophisticated than the ones provided by PC Plus. Specifically, offerings can be founded in demographic information, purchasing history, and in-store behavior. Higher margin private label brands, Irresistible and Selection should be the focus of promotions in an effort to grow profitability through this investment.

While Wi-Fi beacons can push notification to mobile devices using the network, it can create the impression of spam and lack of privacy. Metro can overcome this by using the acquired data and promotion capabilities only through its existing mobile application, My Metro. The company can provide education of the service prior to download, assuming participating customers will be more receptive to push notifications.

Once the app is downloaded, Metro needs to encourage users to use in-store Wi-Fi to make the offering effective. Beacon technology will then be able to collect a plethora of information on customers across multiple Metro locations and visits. This data, combined with demographic information and purchasing history collected from My Metro's integration with Air Miles will allow the creation of a detailed profile for each shopper.



Metro Data Collection

Over time, as data is continually collected, Metro's customized push notifications sent through My Metro will become increasingly personalized and be offered while shopping in real-time. This increased knowledge and access to customers should be used to upsell Metro's private label brands, which have product offerings that range all grocery types. By promoting these private label brands, Metro will be able to increase the profitability of each customer's basket.

Promoting the Application

The most challenging aspect of a successful mobile application strategy is guiding customers to download and use the application. There should be a low level of promotion needed to encourage those who already have My Metro to use the Wi-Fi network. To encourage application downloads from new users, Metro will have to promote clear incentives. A proven strategy employed by current Turnstyle partners is to have physical signage that will encourage shoppers to sign on to the Wi-Fi network. In its initial promotion, Metro could provide deep discounts or giveaways of its private label products if shoppers sign on to the network and download My Metro. Continual usage of the application will be dependent on Metro's ability to provide valuable offerings and discounts to customers.

Worth the Investment

Installation of storewide Wi-Fi with beacons at all Metro locations would require an initial investment approximately $21.6M and a yearly cost of $3.5M. Through Wi-Fi beacon technology, Metro can convert customers from purchasing brand name products to Metro's higher margin private label brands instead, generating 4.7% incremental gross profit per basket. If Metro can increase its app adoption rate by 2% of its customer base and assuming a gross margin of 27% - within the range of industry standards - this venture would increase Metro's gross profits by $6.8M annually, or 0.31%. While this is relatively small compared to Metro's size, growth of gross profits are in constant flux and only experienced a 2.4% CAGR over the last four years; any sustainable increase is a benefit when every percentile matters in the grocery industry. This would yield an ROI of 15%, which is standard for the grocery industry. In the long term, if Metro is able to match Loblaw's current private label percentage of sales of 27%, the company would see gross profit growth of 3.14%.

Financial gains aside, in-depth customer data and direct customer access can only be beneficial as technology becomes more ingrained in the lives of consumers. By adopting beacon technology, Metro has the opportunity to obtain loyal customers who will visit the stores for far more than just eggs.

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BOMBARDIER: SPREADING ITS WINGS

Bombardier Aerospace's current CSeries project is stuck on the runway and needs a strategic partner to take off

Andrew Kanapatski

Bombardier's history of developing new and underserved market segments began with Joseph-Armand Bombardier, the inventor of the modern recreational snowmobile. Similarly, Bombardier's two CSeries jets are a contribution to the previously underserved middle-range jet segment - a step away from Bombardier's core aerospace offering, short-range Q400 Turboprops. While Bombardier is a leader in transportation solutions and the third largest aircraft manufacturer in the world, CSeries development delays have pushed the company to lay off 1,700 employees, terminate the promising Learjet 85 program, and increase debt by 242%. When Bombardier does eventually get production off the ground, it needs a large quantity of orders to ensure the ballooning investment in the project, currently at $5.4B, makes a return. Originally, Bombardier intended to have 300 firm orders for the CSeries before launch – on an initial investment of $3.4B. With this investment having increased almost 60%, it would follow Bombardier should currently be aiming for 475 to meet the original corporate targets. However, even with the well-publicized purchase order from flymojo, Bombardier has still only managed to secure 263 firm orders after five years. Altogether, Bombardier is well shy of the original 300 order, let alone 475. With ongoing delays and a lack of orders, questions about Bombardier's CSeries project linger.

The Blue Sky

The two major players in the aerospace industry are Airbus and Boeing. For the past two decades, both members have focused resources on larger narrow body aircrafts in the 150+ seat-range. Largely overlooked in this competitive struggle has been the smaller 100-150-seat narrow body segment. Airbus estimates that there will be 31,000 total airplane orders in the next 20 years. While the 150-240 segment - Airbus's and Boeing's core competency - is expected to generate 9,660 of these orders, the 100-150 seat segment is expected to generate 7,100, representing about 22% of the total market. Despite significant market potential, only 1.3% and 3.3% of Airbus and Boeing's respective orders are for this 100-150 seat segment. This suggests a significant industry capacity gap, which Bombardier plans to exploit.

Buyers in the airline industry are extremely price sensitive, with respect to both initial pricing and operating costs. Ongoing costs are impacted by aircraft design, fuel efficiency, and fleet integration, as each type of plane in a fleet requires specific pilots, support staff, and facilities. If fleet integration is not possible, buyers require either an upfront discount or unusually high operational savings to offset lost efficiencies. In the past, smaller planes have sold poorly as it tends to be more profitable to operate a larger aircraft even with a slightly lower occupancy as opposed to operating a smaller.

The Plane Field

In the early 2000s, a need for new aircrafts and high-anticipated growth made the 100-150 seat segmented an attractive opportunity for Bombardier. The solution to

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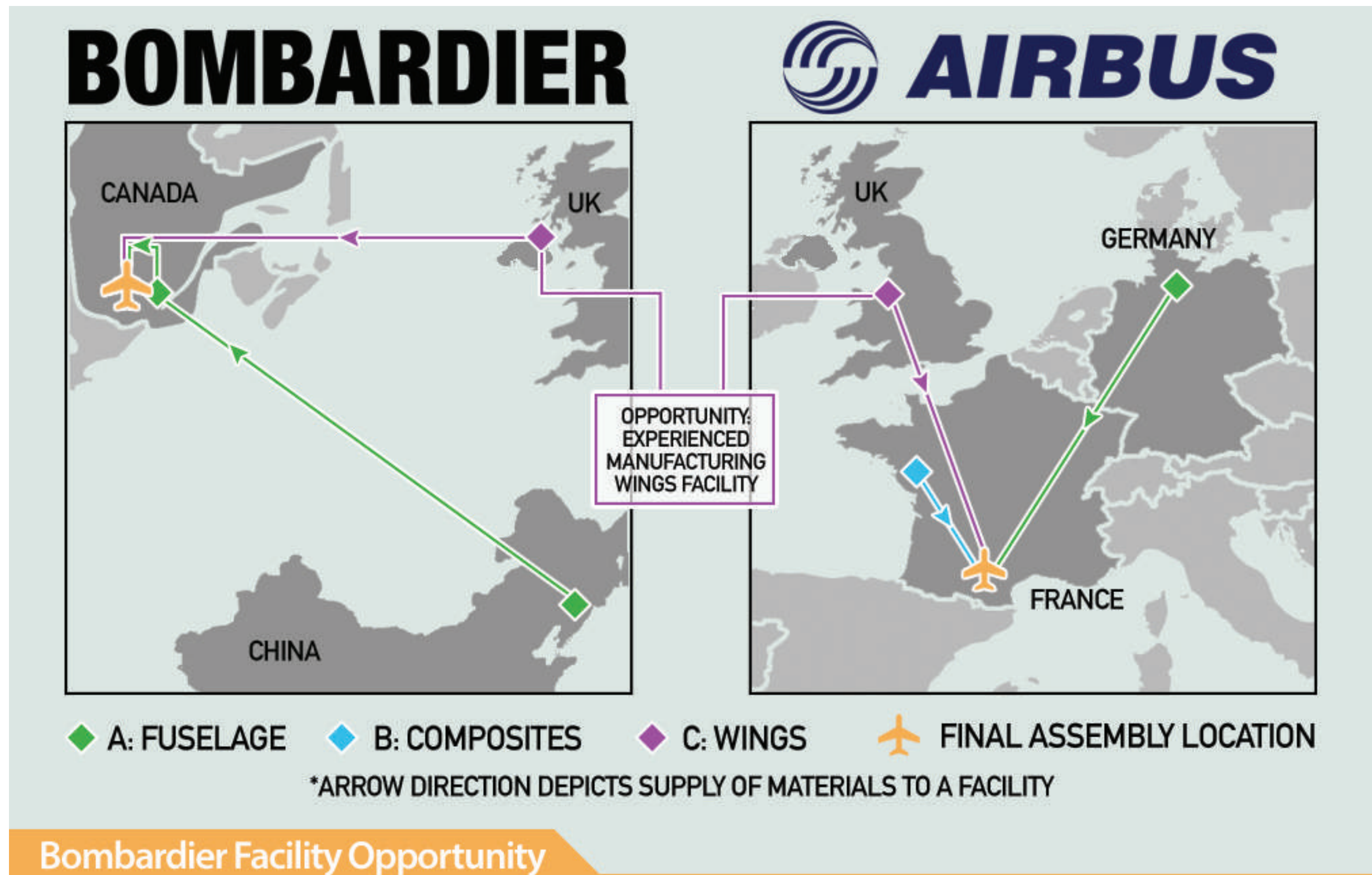

Bombardier Facility Opportunity

this gap in the market was the CSeries. The CS100 and CS300 are clean sheet (designed from scratch) fly-by-wire (fully electrical flight control systems) aircrafts, designed to be the most cost efficient aircrafts in the segment. Unlike reused models, clean sheet projects bear a higher upfront development cost, but tend to yield significantly better cost-per-available-seat-mile for potential buyers. Despite the added efficiency, few incumbents attempt clean sheet projects given the low margins in the aerospace manufacturing industry. As a result, Embraer, Airbus, and Boeing all planned on releasing new vehicles based largely on older, proven, but less efficient designs.

"UNLIKE REUSED MODELS, CLEAN SHEET PROJECTS BEAR A HIGHER UPFRONT DEVELOPMENT COST, BUT TEND TO YIELD SIGNIFICANTLY BETTER COST-PER-AVAILABLE-SEAT-MILE FOR POTENTIAL BUYERS."

Currently, while Boeing has a substantial number of orders, Airbus's 100 – 150 seat narrow body offering has struggled to gain traction. Despite having a trusted customer base seeking the operational efficiencies inherent in the Airbus fleet, the company has only receiving 46 orders to date. Unlike Boeing, customers seem to be avoiding Airbus's refurbished design. Due to the cost saving advantages of fleet integration, failing to successfully enter the smaller plane segment will leave Airbus in a position of weakness. As a result, Airbus inevitably has to generate more orders in the 100-150 seat segment in the foreseeable future, so as to not lose a toehold against Boeing, even if immediate financial results are not encouraging.

Buyer Beware

The major limitations of the CSeries' success is Bombardier's inability to generate unit sales. Given the buyer power in the industry, there are several major factors contributing to low demand for the aircraft.

1 – Service Infrastructure Weakness

Bombardier has relatively weak service infrastructure compared to its competitors. The company outsources most training services, has a limited service center network, and lacks software offerings. For example, the industry standard is for manufacturers to set up their own crew training facilities in order to generate additional revenue and provide an auxiliary service for aircraft buyers. Except in the case of private jets, Bombardier typically uses a third party provider and simply refers its

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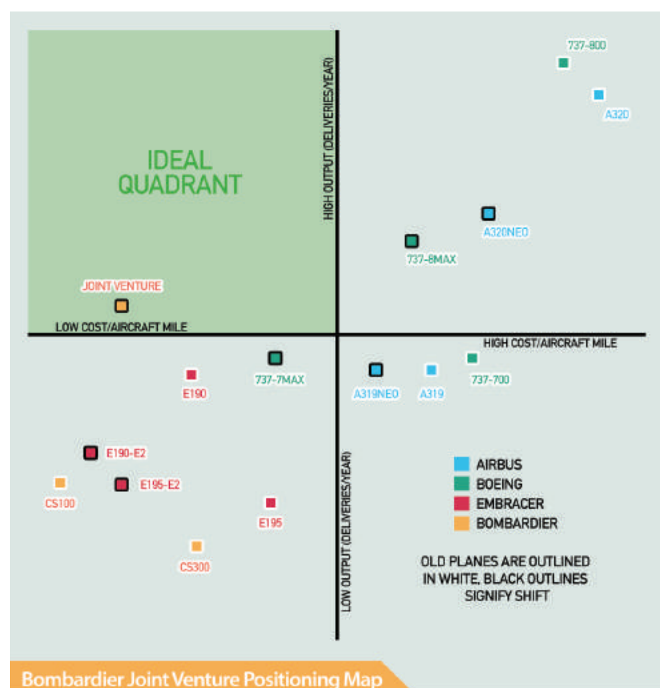
clients. Even though it is a less capital-intensive solution, it does not provide the services often expected following a $70 million product. In contrast, players like Embraer are capable of offering extensive auxiliary services alongside their aircrafts to entice customers and yield ongoing services revenue beyond the purchase of aircraft.

2 – Manufacturer Risk

Buyers operate in a high risk, low ROI environment, and therefore tend to be very risk averse. Bombardier's investment in the CSeries and resultant financial woes has placed the company in a precarious position with solvency issues looming. Should Bombardier's financials worsen, buyers would contend with an increasing risk of never receiving their order - prompting hesitation in the market. Airlines simply can't afford to wait on an aircraft that may never arrive. One example of this is Lufthansa's Austrian division, who recently ordered from the Brazilian government backed Embraer, backing out of a potential order for the CSeries.

3 – Timing Risk

"We have completely forgotten about it because you cannot wait indefinitely," said Qatar Airways CEO Akbar Al Baker to Reuters on March 4th. Bombardier's release delays have not only deterred potential clients, but also greatly dissatisfied existing customers with 2014 orders now expected to ship in 2018, instead of initial estimates more than a year earlier. Many potential buyers may opt to sacrifice operational efficiency in exchange for timely delivery. Bombardier has not received a single new order in 2015, likely as a result of its order backlog. Airlines are less willing to put a down payment on aircrafts that will not arrive for three or four years at the earliest, when competitors can promise delivery in 2017.



Bombardier Joint Venture Positioning Map

Waypoints

At this point, there are three clear options for Bombardier. First, the company can keep developing the CSeries, releasing it as soon as possible. According to analyst reports from Canaccord Genuity, proceeding with this plan will generate the firm $3.9B in incremental cash flow. However, considering that the firm has already invested $5.4B in the project, these incremental gains would result in Bombardier losing $1.5B in total on the project. Alternatively, Bombardier could attempt to sell the CSeries to the highest bidder. Accounting for its investment, Bombardier would have to sell the CSeries line for more than $4B to beat the $1.5B loss from proceeding alone. Even assuming the buyer can price the CSeries 10% higher than Bombardier, the buyer would still need to capture 75% of the market to break even on its investment, making the quest to find a buyer difficult. There is, however, a third option for Bombardier - a joint venture.

> **"CONSIDERING [BOMBARDIER] HAS ALREADY INVESTED $5.4B IN THE PROJECT, [THE $3.9B] INCREMENTAL GAINS WOULD RESULT IN BOMBARDIER LOSING $1.5B IN TOTAL ON THE PROJECT."**

It Takes Two

Bombardier needs to significantly increase the number of firm orders from buyers to make the CSeries project a success. In order to do so, it must address the many the issues that buyers have with Bombardier's manufacturing. Most of this risk stems from Bombardier's small size, lack of extensive service reach, and instability. Alternatively, Airbus is struggling to sell its smaller narrow body aircraft and lacks a clean sheet product. Airbus could develop a new plane, but development would only be possible by 2030. Meanwhile, Bombardier's product boasts an innovative design enabling the best-in-class operational savings.

Therefore, Bombardier should seek to enter a joint venture agreement with Airbus. Through an agreement of this nature Bombardier is able to mitigate most of the buyer's risk associated with purchasing a CSeries aircraft, while Airbus is able to enter a fast growing segment it currently has few viable products in, all while making a profit. This move would be mutually beneficial, enabling

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Airbus to shift the dynamics in the duopoly in its favour while allowing Bombardier to secure the coveted third position in the market, and its financial future.

"THE RISK-SHARING NATURE OF THE JOINT VENTURE WILL ABATE BOMBARDIER'S DEFAULT RISK AND ALLOW BOTH COMPANIES TO ACCELERATE DEVELOPMENT OF NEXT-GENERATION AIRCRAFT USING MODERN TECHNOLOGIES."

Joint ventures are not a novelty for aircraft manufacturers, as both Bombardier and Airbus have participated in multiple joint ventures in the past. The risk-sharing nature of the joint venture will abate Bombardier's default risk and allow both companies to accelerate development of next-generation aircraft using modern technologies. Currently, Bombardier has patented a proprietary technology that stands to improve the composite materials in wing production. Despite significant IP, the firm has little manufacturing experience applying this technology. As Airbus has significant experience using composite materials, together these firms could improve wing-manufacturing output, thereby increasing each firm's competitive profile against Boeing and Embraer. This is feasible, as Bombardier's wing production facility in Belfast is just over 300 km away from Airbus's Northern Wales facility that specialized in manufacturing composite wings for Airbus's widebody products.

"BOMBARDIER'S WING PRODUCTION FACILITY IN BELFAST IS JUST OVER 300 KM AWAY FROM AIRBUS'S NORTHERN WALES FACILITY THAT SPECIALIZED IN MANUFACTURING COMPOSITE WINGS"

A joint venture also allows Bombardier and Airbus to combine and improve service network capabilities. For example, they could couple Bombardier's Smart Parts program, which offers an insurance-like product on airline parts, with Airbus's FlySmart software solutions, a program to manage these operations. Together, this system would provide an all-in-one operations solution, likely generating additional service revenues from the venture and increase product-service bundling for the CSeries. Further, this package would lower operational costs for potential, increasing the appetite for purchase.

Request for Fly-by

This move would change the competitive landscape of the industry in favour of Bombardier and Airbus for years to come. Bombardier would own most of the IP on arguably the best plane in the segment, and Airbus would have better prepared its engineers and manufacturing facilities for the following generation of its own aircraft. While Airbus and Bombardier are flying ahead, Boeing and Embraer are left behind trying to extract value from recycled designs.

Altogether, with Airbus and Bombardier joining forces, the project most strongly resembles what the CSeries was intended to be – the strongest product in the market. Looking at what analysts expected the CSeries to sell before the numerous delays, a fully valued CSeries plane was expected to generate 50% more unit sales on average. Since a joint venture between Airbus and Bombardier would create a similarly demanded plane, it is expected the discounted cash flows of the joint venture is 36% higher compared to Bombardier operating alone. Applying a 50/50 equity split would result in over $3B of incremental cash flow to Airbus, and greatly reduce the financial impact of increased debt and prior project delays on Bombardier, as compensated by additional sales.

There is a lot of media attention, rumors, and uncertainty surrounding the CSeries. Bombardier has focused all of its strategic resources to ensure that its flagship is a success. Management is confident that plane will succeed and will establish Bombardier as a medium and, potentially, long-range manufacturer in the future. However, just releasing the aircraft will not convince potential buyers to sign a contract; time, scale, churn rates, and many other factors can prevent Bombardier's success. Both Airbus and Bombardier are fighting on an order-by-order basis with their respective rivals and this strategy could result in locking manifold benefits for both parties moving forward.

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A STATE OF CONFORMITY

After a 3D printing related setback, an emerging player may be just what Stryker needs to secure its position in the 3D orthopaedics

Robbie Sparrow

Introduction

Over the past few years, 3D printing has rapidly entered the medical device industry, and orthopaedic implants are at the cutting edge of this innovation. A young boy recently received a 3D printed vertebrae, and doctors are also able to now 3D print fully-customized facial reconstruction implants. While these advances promise to open up new markets and areas of research, 3D printing also poses a significant threat to the business models of the three largest orthopaedic companies: DePuy Synthes, Stryker, and Zimmer. Of the incumbents, Stryker Corporation is in the weakest position to meet the challenges of 3D printing and should expand its traditional knee implant product line through the acquisition of ConforMIS, Inc.

Orthopaedics Industry

Over the last few decades, the orthopaedics industry has been quite profitable, with 5% annual growth and 20-25% operating profit margins. The main driver of this growth has been an ageing population in developed markets. Although the industry is predicted to continue growing at 4.9% until 2019, this growth will be accompanied by shrinking margins. In fact, AT Kearney predicts a fall in margins to 16% by 2020 as a result of health insurance companies trying to reduce their surgical reimbursements to hospitals. Hospital consolidation is occurring at double the rate of five years ago, which is slowly increasing their purchasing power. Moreover, purchasing decisions are slowly moving away from surgeon preference, towards evidence-based medicine. This is all an attempt to provide favourable patient outcomes that are also cost-effective for hospitals.

Medical device companies have begun lowering prices on knee and hip implants in an effort to maintain market share and continue growing unit sales as a result of industry maturation. These trends are driving consolidation within the industry. In 2012, Johnson & Johnson bought Synthes and merged it with DePuy; similarly, Zimmer recently purchased Biomet Inc. for $13.4B, making it the market leader in the joint replacement market. Stryker has also recently made a number of successful acquisitions, but has suffered from a large recall of one of its first 3D printed products.

3D Printing and Orthopaedics

3D printing technologies offer the ability to customize different aspects of an orthopaedic surgery to a patient's unique bone structure and are poised to disrupt the value chain of traditional orthopaedics. For Stryker, there are three major applications where 3D printing technology could help it better compete in the massive knee and hip implant market:

Patient-Specific Instruments (PSIs) - Customized guides that surgeons place on a patient's knee or hip to ensure optimal drilling and cutting during surgery.

Mega Hip Implants - Individuals who have bone cancer or severe fractures often need to have portions of their hip bone cut

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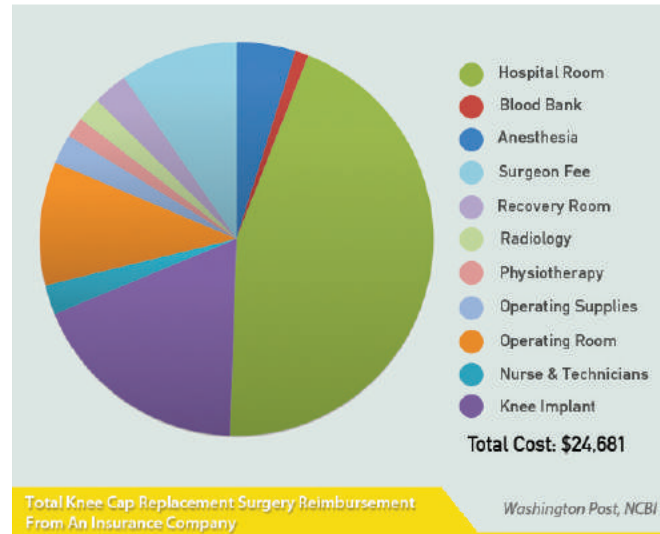
away and replaced by implants customized to the shape of their previous bone structure.

Personalized Knee Implants - Physicians take a CT scan of a patient's knee, and an implant is customized and printed exactly for the patient's anatomy.



Total Knee Cap Replacement Surgery Reimbursement From An Insurance Company

Washington Post, NCBI

All of the major orthopaedics manufacturers are taking advantage of 3D printing technology to some extent. Stryker has previously developed a 3D printed cutting guide PSI system for its traditional knee implants called ShapeMatch. Unfortunately in April 2013, it was recalled due to software defects. This has put Stryker behind in 3D printing innovation, with DePuy Synthes and Zimmer having subsequently released similar products without such defects. Although PSIs have shown promise in improving the surgical process, they have failed to show significant improvement in patient outcomes. Increased cost of surgery to hospitals without significant improvements in surgery outcomes, coupled with its recent recall, make this segment less attractive for Stryker to focus on as the core of its 3D printing strategy.

Contrarily, 3D printed mega hip implants have been shown to significantly improve patient health. However, despite high margins on these implants, the market for such devices is small compared to total hip and total knee procedures, which are the core of Stryker's business. Therefore, the most promising application of 3D printing technology for Stryker is the personalized knee implant segment – coincidentally the largest orthopedic implant market. Knee implants are also one of Stryker's core competencies, comprising 15% of Stryker's $9B revenue in 2013, and acting as one of Stryker's largest revenue drivers.

The American knee surgery market is large, with over 719,000 surgeries performed in the United States every year. Further, as a sub-segment of orthopedics, this market is expected to continue growing, leaving significant room for Stryker to use new innovation to claim market share. Despite their financial and technological resources, developing a proprietary system to be approved by regulatory agencies, and amassing a sizeable set of convincing clinical data to gain hospital approval represents a substantial market entry barrier for Stryker. This process could take years, and Stryker is already lagging in the 3D printed patient positioner segment.

"THE AMERICAN KNEE SURGERY MARKET IS LARGE, WITH OVER 719,000 SURGERIES PERFORMED IN THE UNITED STATES EVERY YEAR."

A Novel Approach to Knee Implants

A recent 2010 study reports that up to 37% of patients are not satisfied with the outcome of their total knee surgery three years after the operation. An innovative orthopedics company called ConforMIS, Inc. has set out to change that. Currently, ConforMIS is the only American company offering fully customized knee implants using 3D printing technology. Its 3D printed implants are made of cobalt chromium molybdenum alloy, a common orthopedic metal, and polyethylene. This gives it the same structural integrity as a traditional implant with the benefit of full customizability. Nineteen studies commissioned by ConforMIS have demonstrated that personalized implants can produce better patient outcomes. So far, ConforMIS has achieved a compound annual growth rate of 118% over the past three years, with sales growth from $6M to $29M. As ConforMIS collects more favorable research data on patients who use its implants, it will be able to create key data sets to more effectively market to hospitals using evidence based purchasing methodologies, driving growth. In addition, ConforMIS owns more than 375 patents on items such as imaging software, implant design, manufacturing, and surgical techniques. Its patent portfolio was ranked as one of the most powerful in the medical device industry in 2014 and will protect its technology over the course of its growth in the coming years.

"CURRENTLY, CONFORMIS IS THE ONLY AMERICAN COMPANY OFFERING FULLY CUSTOMIZED KNEE IMPLANTS USING 3D PRINTING TECHNOLOGY."

In most cases, a total knee replacement surgery is paid for by insurance providers, who provide a fixed reimbursement to hospitals. Hospitals then have to purchase the implants and negotiate the price with manufacturers. Due to the persistent cost pressure on hospitals, it is important that ConforMIS implants are cost competitive. Currently, ConforMIS implants are covered by private health insurance providers along with Medicare and Medicaid under the same reimbursement as off-the-shelf implants. After analyzing all relevant expenses, it

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	ConforMIS	Off-The-Shelf
Length of Hospital Stay (Days)	3	3.2
Transfusion Rate	2.4%	10.7%
Adverse Event Rate	1.6%	13.9%
Patients Discharged to Acute Care Facility	2.4%	13.9%

Comparison of Patient Outcomes

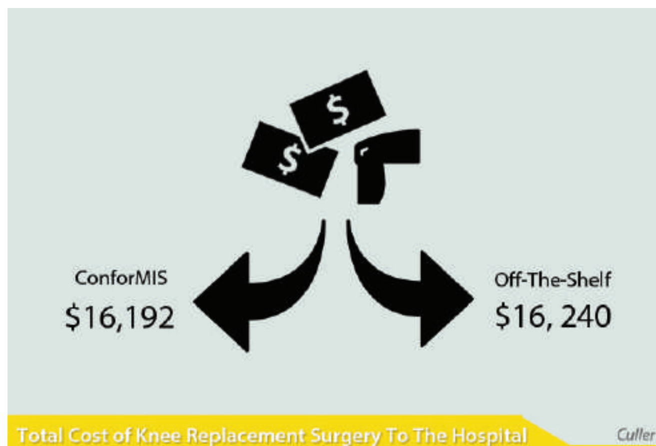
Culler

was determined that the total cost of the surgery to a hospital is virtually the same despite the customized implants being slightly more expensive. This includes all costs related to hospital stay-duration, the need for blood transfusions, and surgery complications. This gives the ConforMIS technology a significant advantage going forward and the potential for large scale organic growth as hospitals begin to seek out this technology.

Strategic Acquisition of ConforMIS

The best way for Stryker to enter the personalized 3D printing knee implants segment is through the acquisition of ConforMIS. This will allow Stryker to effectively provide proven custom implants to the mass market while addressing the needs and motivations of patients, doctors, hospitals, and insurance companies.

Following the ConforMIS acquisition, Stryker will be able to use its size and broad sales reach to solidify the technology's number one position in custom knee implants. Stryker gives ConforMIS access to a global distribution network, a skilled sales team, better access to international markets and an established brand, which will help streamline operations. Specifically, Stryker will be able to improve the workflow process for doctors and technicians. It currently takes ConforMIS six weeks from the initial CT scan to the custom implant arriving at the hospital. Over the course of this process, ConforMIS must receive CT scans, design the implant, go through an iteration process with physician approval, and have the implant printed in its Massachusetts facility.



Total Cost of Knee Replacement Surgery To The Hospital

Culler

Stryker can improve the process by improving the system integration of CT scanning facilities with ConforMIS's iFit Image-to-Implant® software. CT and MRI scan files use a common DICOM file format across manufacturers, however system integration can be a challenge. ConforMIS currently interacts with scanning facilities by accepting files via upload onto their website, secure connections to a hospital's Picture Archiving and Communication System (PACS) and even mailed scans on a CD in some cases which slows the process considerably. Stryker can use its size and influence with CT scanner manufacturers and PACS software developers, such as GE Healthcare, Phillips, and Siemens, to integrate native functionality into its systems. This will better and directly integrate the CT scan transfer process from hospital's PACS to ConforMIS. Developing a seamless end-to-end custom implant process will further solidify Stryker and ConfrMIS's relationships with surgeons and make them less inclined to switch implant suppliers as the 3D knee implant market grows. Over time, ConforMIS will be able to improve the quality of its incoming scan data to improve the precision of its 3D printing capabilities and the definition of each implant, eventually providing an end product that traditional off-the-shelf implants can't match.

Stryker's breadth of legal resources will also help ConforMIS defend its crucial patent portfolio throughout its expansion and sales growth. This is an effort to make it more difficult for other large competitors to duplicate the technology and enter the market. The reality is, without this acquisition Stryker would have to work around all of ConforMIS's patents to develop its own tech – easier said than done. It's better for the company to work together, rather than fight each other.

Overall, Stryker has a huge opportunity to capitalize on the growth of knee orthopedics implants in the coming decade. With the promise of better patient outcomes with similar total costs to hospitals, ConforMIS's implant technology is ideally suited for Stryker. By investing in 3D printing technology today, Stryker will be able to protect its market share going forward. Instead of waiting for customized implants to become the norm, Stryker can set it – with the help of ConforMIS that is.

"THE REALITY IS, WITHOUT THIS ACQUISITION STRYKER WOULD HAVE TO WORK AROUND ALL OF CONFORMIS'S PATENTS TO DEVELOP ITS OWN TECH – EASIER SAID THAN DONE."

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BIOPRINTING A NEW HOPE

Testing new drugs on 3D printed microtissues may be the solution to Roche's R&D woes

Marco Chan, Dave Tang

The pharmaceutical and biotechnology industry is in the midst of a cost crisis. The number of drugs approved per billion USD spent on Research and Development (R&D) has halved every nine years since the 1950s. Compounding the problem, the amount of time necessary to get drugs to market has continued to increase, stretching market leaders as older drugs expire before newer products in development get to market. The amount of revenue generated by drugs which had patents expire in 2014 generated almost $50B in industry revenue annually – these drugs are now at risk of cheaper competition via biosimilar products. Roche Holdings Ltd. (Roche), a Switzerland-based pharmaceuticals and diagnostics company, has been significantly affected by this phenomenon. To continue functioning effectively, Roche must counteract this ominous trend by utilizing innovative technologies from InSphero Inc. to substantially increase R&D efficiency.

Pharmaceutical Industry Overview

Revenue growth for the global pharmaceutical industry is projected to taper to 1.6% per annum by 2020. Combined with ballooning R&D costs, pharmaceutical companies will see declining profitability. This negative forecast is driven in part by the expiration of $230B, in annual revenue, of patents between 2011-2015; creating an unprecedented 'patent cliff' that pharmaceutical companies are worriedly trying to replace. As these patents expire, biosimilar manufacturers quickly flood the market with 'generic' substitutes, driving down prices and profitability significantly. For example, Pfizer Inc.'s blockbuster drug Lipitor saw a 42% drop in sales and 19% overall profit decline due to substitutes after the drug's patent expired in 2011.

As drug approvals are a multi-year and risky process, big pharma companies are turning towards M&A for short to medium-term growth, specifically by acquiring companies with potential blockbuster drugs partway through the development cycle. Fuelled by cheap debt, there has been over $260B in M&A activity in 2014, the most since 2002.

Drug Approval Process

Currently, the average drug approval process spans 12 years. In order to gain FDA approval, pharmaceutical companies must test compounds via a series of rigorously monitored examination stages to ensure product safety and effectiveness. Following development of a new compound, pharmaceutical companies begin the pre-clinical process by testing on multiple animal species for toxicity and adverse effects. If successful, the drug sponsor will submit an Investigational New Drug application to seek approval for initial human testing. After receiving verification, the compound will begin clinical trials on humans.

In the first phase of clinical trials, the compound will be tested on less than one hundred healthy volunteers to determine the safety of the compound, how it is metabolized, and possible side effects. If the drug appears safe, the second phase of clinical trials is initiated, which consists of testing the compound on hundreds of individuals afflicted with the applicable condition to establish effectiveness. Finally, should the drug pass phase

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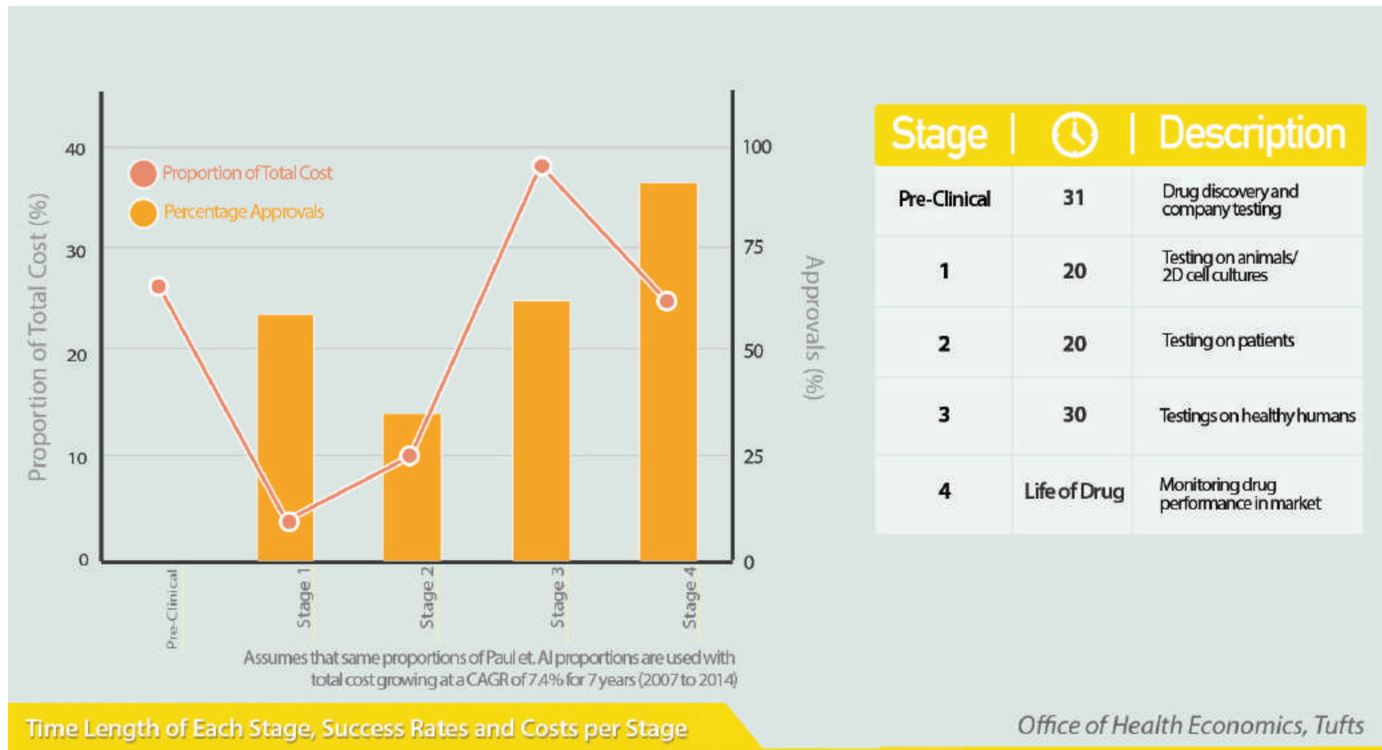

Time Length of Each Stage, Success Rates and Costs per Stage

two, the compound enters the final phase of clinical testing (phase 3) to gather more information about safety and drug effectiveness.

Overall, the success rate of a single compound receiving FDA approval is 7.1% and the average cost per new drug approved, including failures, is $2.6B as of 2014. In addition, the average time for a clinical trial increased by 70% from 1999-2005 due to an increasingly stringent regulatory processes. The more effectively a pharmaceutical company can screen compounds before initiating the FDA approval process, the more time, manpower, and cash can be saved. Early screening allows pharmaceutical companies to improve drug design and improve probability of success with a much lower investment.

"THE AVERAGE TIME FOR A CLINICAL TRIAL INCREASED BY 70% FROM 1999-2005 DUE TO AN INCREASINGLY STRINGENT REGULATORY PROCESS."

Opportunity for Roche

As a global leader in biotechnology, Roche has developed its market position primarily within oncology, the branch of medicine that deals with tumours and autoimmune diseases. Holding a substantial 9.2% of global pharmaceutical sales, Roche is currently the largest player in the oncology space and, by revenue, is as large as the next three competitors combined. This market is the largest therapeutic class with annual sales of $67B and is expected to grow at a CAGR of 7% to $109B by 2020.

Roche is facing a number of challenges including the recent unpegging of the Swiss franc. This currency upswing heavily impacted Roche's profitability because most of its costs are incurred in Swiss francs, while over half of revenues are denominated in other (now less valuable) currencies. Roche also appears most susceptible to the patent cliff given the company has a history of one of the highest R&D expense-to-revenue ratio of any major pharmaceutical firms. Despite its size, Roche is incredibly susceptible to future market forces and needs to innovate its drug testing processes.

InSphero: The Way Forward

InSphero is a private company headquartered in Switzerland that supplies in-vitro 3D microtissues for preclinical drug testing. Preclinical studies are needed to ensure a degree is safe before formal clinical trials are pursued. Testing of 2D in-vitro studies are the industry standard; however, 3D microtissues are more effective due to longer lifetimes and a more realistic reaction to drug responses. An example of this difference is evidenced when testing breast cancer cells; 2D cell cultures can be killed with low doses of chemotherapeutic drugs or radiation, while 3D cell cultures are resistant to similar doses, better reflecting the effects on the human body.

InSphero is able to create 3D cell cultures through a patented process , and can produce human livers, tumours, and custom microtissues. A liver is typically priced around $2,000 USD per 96 microtissues; however, many other products are priced dynamically given the custom nature of the microtissues. To date, InSphero's clients include the top-15-pharmaceutical and cosmetics companies, while continually collaborating with top researchers at universities. In a study conducted by Genentech,

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a subsidiary of Roche, InSphero's 3D liver microtissues were able to detect toxicity at significantly lower concentrations in 13 of the 42 compounds tested. This improved sensitivity allows big pharma companies to filter out drug candidates that may have potentially passed through 2D cell culture testing but fail in 3D clinical testing. By aborting a project before the FDA approval process begins significant time and money can be saved.

Redefining R&D

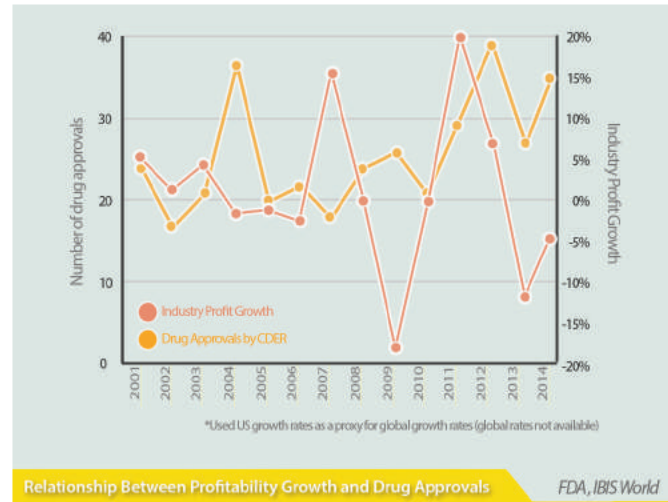
Roche should acquire InSphero to take further advantage of its 3D tissue technology. As Roche continues to spend an increasing amount on failed drugs, InSphero offers a way to reverse that trend. InSphero's technology may prove especially beneficial in the oncology segment, as the company has the expertise to quickly create custom tumours for Roche's oncology drug testing. By frontloading InSphero's capabilities onto safety and efficacy testing with 3D tissues, factors that contribute to 57% and 10% of all Phase III failures respectively, Roche gains a valuable cost advantage. Roche gains the ability to potentially prevent hundreds of millions of dollars from being lost on drug failures further along in the development cycle.

The entirety of the FDA approval process costs on average $382M in total as of 2014, regardless of whether a compound passes or fails the third phase. However costs rise at each stage - Phase I costs $28M, Phase II costs $74M, and Phase III costs $280M. The cost savings that Roche can realize if they screen out a drug at the preclinical stage rather than during clinical testing is at least $28M or up to $382M for a Phase III failure. These cost savings can be passed back into further R&D efforts, swelling compound output and, in turn, Roche's bottom line.

Refocusing R&D

Following an acquisition, Roche can directly focus InSphero's efforts towards further developments applicable to oncology. The technology is in its infancy, giving Roche an opportunity to purchase InSphero at a lower valuation before the technology gains wide-spread adoption. An acquisition is more favourable than a partnership in this case, since it provides Roche more control over InSphero's R&D focus. InSphero has already launched its "Personalized Tumour Kit" that grows mini tumours based on a patient's tumour material. These tumours can identify cancer biomarkers, which are genetic codes or human processes that are cancer indicators, helping healthcare professionals develop targeted medicine treatments. Testing drugs on tumours with specific biomarkers will lead to higher efficacy drugs with faster drug development times. Faster development increases the length of time a patented product can be commercially available driving revenues and profitability.

For InSphero, the benefits lie in both the funding required for the amplified R&D spending necessary to remain an industry leader, as well as the addition of a strong strategic partner. Roche has a cash balance of over $3.7B and can provide low



Relationship Between Profitability Growth and Drug Approvals FDA, IBIS World

interest access to financing. Expertise sharing between the two entities may also allow for more effective tissue development. In addition, Roche serves as a guaranteed client to test the effectiveness of InSphero products.

"FOR INSPHERO, THE BENEFITS LIES IN INCREASED CASH FOR R&D AND ATTAINING A STRONG STRATEGIC PARTNER."

It is time for Roche to change the way they approach R&D. With the incessant escalation of R&D expenses across the industry, Roche needs a new and more efficient way to test their drugs in development and maintain competitiveness in the market. InSphero offers such an opportunity - reliable, tested 3D microtissues that are a significant improvement upon the 2D cell cultures most often used by Roche. InSphero will be able to continue selling tissues through Roche to other pharmaceutical manufacturers, as 3D tissue technology is far superior to current pre-clinical testing methods. This allows InSphero to continue generating profits it would have otherwise generated but with the benefit of a significant backer and a constant customer. With InSphero, Roche will begin its own cost-saving revolution across its business units. As a result of this upheaval, Roche will be able to test compounds more efficiently, create more drugs for the commercial market, and continue saving the world, one drug at a time.

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