promontory
investment research

Regeneron Pharmaceuticals

Vuzix

Mastercard

John Deere

Spring 2021 Equity Report

Foreword

Promontory Investment Research is proud to present its ninth equity research report in print. Our Research Analysts have continued to deliver high quality reports, so we are thrilled to share our newest research with you.

Although coronavirus has presented us with many different challenges, Promontory has unwaveringly maintained the tight-knit community while producing quality research reports. Our Research Analysts delved into eight companies from different industries, and we have chosen the four best to publish: Regeneron, a biotech company that develops solutions for the treatment of serious diseases, Vuzix, an augmented reality company that develops glasses for enterprises and consumers, Mastercard, a global payments processing company that connects people and businesses together, and John Deere, an established agricultural manufacturing company that offers equipment and services within farming, construction, and forestry.

Over the past ten weeks, each Research Analyst "pod" spent a lot of time brainstorming by themselves, working closely with our Research Committee, and creating their own quantitative models all to cultivate and support their respective investment thesis. We believe that this publication is a strong reflection of all the time and consideration our Research Analysts have put into their work and we hope you enjoy reading what they have to say. We recently began an online publication of our Research Analysts who decided to write a white paper or industry primer on any topic or industry of their choice. We encourage you to join the discourse through reading our work and discussing with us your personal thoughts.

We look forward to the future with excitement as always, especially as we transition in person. Our organization is continually strengthened by the visible dedication and efforts of all our members. Internally, we will continue hosting our weekly virtual events along with our pod-specific engagement. We are growing in number and campus presence, but we will not lose sight of our mission to maintain a welcoming environment. We especially hope to foster a stronger sense of community between the class years through our continued mentor-mentee initiative. Externally, we seek to continue our engagement with the campus community through our annual speaker events and other similar events. Among others, major initiatives we hope to accomplish in the near future include fundraising and philanthropy. We can only promise that there is still much to come for Promontory, and we hope you will keep an eye out for us.

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Promontory Investment Research
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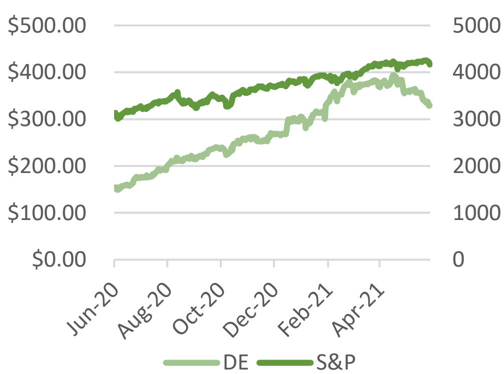
Deere & Company

Deere & Company | NYSE: DE	
Negative Neutral	**Positive**
Share price, 05/26/21:	$358.00
Market capitalization:	$113,128mm
Shares outstanding:	316mm
52-week range:	$400.34 / $148.19
EPS (FY20):	$8.69
Beta	1.05
Average analyst opinion:	$410.65
Price target:	$394.50

Price Chart



Financial Highlights

(Dollars in millions)	2018	2019	2020
Revenue	37318	39233	35514
% Growth	*28.4%*	*5.1%*	*-9.5%*
EBITDA	5941	6179	5450
EBIT	4159	4310	4548
% Margin	*11.1%*	*11.0%*	*12.8%*

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Investment Overview

With a targeted share price at $394.50, we are recommending a **BUY** rating for Deere & Company (NYSE: DE) because of its high level of growth potential in the ever-expanding market of agriculture and construction manufacturing. Due to John Deere's comprehensive distribution network that capitalizes on economies of scale (especially within the Midwest), repeat purchases and brand loyalty, and finally their prioritization of farming efficiency technology and automation, it is clear to see that John Deere possesses several competitive advantages that allow it to be a market incumbent in agricultural work. Additionally, the nature of the agriculture and construction industries means that companies cannot shift to remote working environments like the vast majority of other industries, which means that Deere & Company is poised for a post-pandemic rebound.

Company and Industry Overview

Company Overview

Deere & Company, commonly known by its brand name John Deere, is a company in the industrials sector that was founded in 1837. Based out of Moline, IL the company specifically operates in construction equipment manufacturing, both commercial and residential landscaping, and the manufacturing of tractors/agricultural machinery. They operate in five main markets including the United States, Canada, Western Europe, Central Europe, and Latin America with the U.S. being its largest market. Within these markets, the company is the largest agricultural equipment company and within the top 3 in its other product offerings of construction and forestry equipment. The company currently employs 73,500 workers, and about half of them are located in North America. Deere & Company's highest selling products include their new 9 Series Tractors and their new 400 & 600 Series Sprayers in the agricultural segment. Deere & Company received $39.3 billion in total revenue over the course of 2019, with an operating margin of around 13%. Although the company's revenue decreased by almost 10% in 2020 to be at $35.5 billion, most of the decrease in revenue was due to the hit that the construction industry took as a result of the COVID-19 pandemic. The agriculture and turf segment accounted for 64% of their 2020 revenue.

Similar to other companies in the industrials sector, due to Deere's diversified product line, they often respond well to demand fluctuations. Deere's products are also sold through an international network of independent distributors, as well as through home department retailers for their non-commercial landscaping products. John Deere has just acquired a company named Harvest Profit—a market leading company based out of Fargo, North Dakota which has been known to provide farm profitability software. Deere also acquired a company named Unimil based out of Brazil for $66 million, which specializes in aftermarket parts for sugarcane harvesters. Not only do these investments add to Deere's growth via diversification, but also towards the company's goal to lead the agriculture industry in technological innovation.

Industry Overview

Deere & Company operates in a multitude of industries within the overall industrials sector, but the main areas in which the company is focused are Construction Machinery Manufacturing and Tractors & Agricultural Machinery Manufacturing. Both of these industries can further be broken down into some of John Deere's strong suits; tractors and attachments, consumer lawn, seeding and fertilizing machinery, harvesting machinery, power cranes, dozers and other tractors, maintains and mixers, and far more. As for general overviews about both of these industries, the Construction Machinery Manufacturing industry has a market size that was estimated to be $124.7 billion in 2019. It is also poised to expand with a CAGR of 4.3% between the years of 2020 and 2027.

Exhibit 1: Deere Construction Machinery Manufacturing Industry Revenue

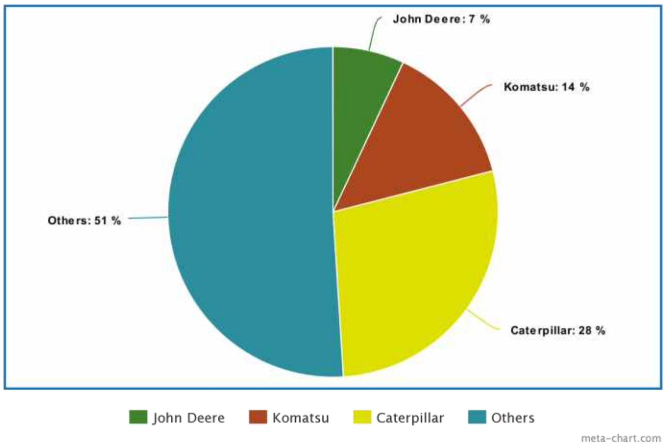
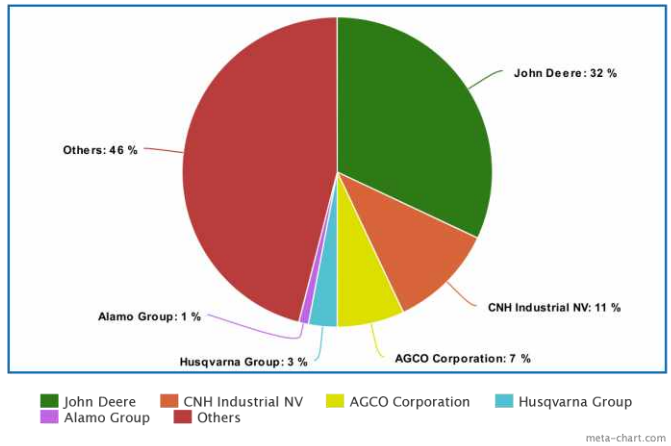


Exhibit 2: Deere Agricultural Equipment Manufacturing Industry Revenue



As for the Agricultural Equipment Manufacturing industry, the market size in 2018 was estimated to be $139.0 billion, and the industry is expected to grow with 8.9% CAGR between 2019 and 2025. Both of these industries have relatively high CAGRs because of the adoption of modern technologies such as autonomous farming vehicles, broader automation and machine intelligence, as well as connectivity & digital solutions, guidance, and hardware & software technology stacks which all will increase productivity and lower operating costs.

To go a little bit more in-depth regarding the former of the two industries, the Construction Machinery Manufacturing industry has 569 active businesses. The industries main players are Caterpillar, Komatsu Ltd., and Deere & Company, who own 27.8%, 14.0%, and 7.3% market share respectively. Deere & Company's market share can be found under their two brands of Waratah and John Deere. Some of the other companies that are operating within the construction equipment manufacturing space include CNH Industrial NV with 2.3% market share, as well as Terex Corporation with 1.8% market share.

As for the latter industry, the Tractors & Agricultural Machinery Manufacturing industry has 1,123 active businesses. Deere & Company has captured the position of market incumbent with around 31.6% market share, making it the largest out of some of its other competitors (CNH Industrial NV, AGCO Corporation, The Husqvarna Group, Alamo Group Incorporated, and more) by far. CNH Industrial NV has captured 11.7% market share, AGCO Corporation has captured 7.3% market share, The Husqvarna Group has captured 2.4% market share, and the Alamo Group has captured 0.7% market share.

Both of the aforementioned industries demonstrate similar qualities and trends. These industries have historically had high revenue growth, yet investing in these industries also pose some risks, including high competition, high volatility, and high cost of imports for large construction equipment. This volatility is exemplified over this past year due to the COVID-19 pandemic. If we take Deere & Co. to be an example for the industry, the company's revenue for 2020 was 9.47% less than it was in 2019, and the company's net income for 2020 was 15.43% less than it was in 2019 -- which is unusual for the company because of their strong historical growth. However, Deere's net income for the quarter ending Jan. 31, 2021 was a 136.75% year-over-year increase, which signals the

Investment Thesis

Comprehensive Distribution Networks with Economies of Scale

John Deere's global parts distribution network strategy begins with a swift order turnaround period that allows them to have a 99% order fill rate. The way in which John Deere has accomplished this is through a strategy called rear/forward inventory deployment. Essentially, this strategy starts with centralized distribution of parts that do not move as fast -- these are usually product SKUs that are obsolete yet exist in the product line anyway. This is paired with regional distribution of parts that move far faster. As a result, this allows for the products that compose the major of John Deere's revenue to be closer to market demand points. This minimizes the turnaround time for orders all around the world, since the common products are near demand points and can get their products with minimal time, whereas the fewer common products are centralized at one distribution point to minimize the amount of space requirements. This is important because the customers of John Deere are reliant on their products for their livelihood. If the tractor breaks down then so do the operations around the farm, and thus it is critical that John Deere can minimize turnaround time to make sure their customers remain satisfied and don't view John Deere as inconsistent and a threat to their livelihood.

As a result, this type of logistics strategy highly benefits the customers of John Deere. The rear/forward distribution strategy is most effective in markets that are characterized by high revenue opportunities, a large geographical footprint which leads to high transportation costs, and lastly high levels of competition where the speed to market is a crucial factor that can be denoted as a competitive advantage. Minimizing the turnaround time for orders is markedly important in both the construction and agricultural industries, especially due to the fact that both of these industries were heavily impacted by the COVID-19 pandemic. However, they are now poised for the largest rebound in recent years, which makes the speed of distribution even more relevant for farmers/construction companies that are looking to capitalize on the momentum of 2021 markets. According to the USDA's planting forecasts, corn acreage is expected to increase by 8%, with other farming categories -- such as livestock and soybean acreage -- ready to expand by similar numbers. John Deere mainly operates with mass orders from home goods retailers for their residential products, whereas large agricultural machinery is produced on a more individualized basis. John Deere consistently ships 80,000 order lines per day with over 500,000 parts in stock at their main distribution center in Milan, IL, and due to their prioritization of the minimization of footprint, the company's swift production/distribution will allow it to continue to be a market leader throughout the rebound of the construction/agriculture industries.

Repeat Purchases and Brand Loyalty

A 2010 study by Farm Equipment and Farm Progress shows that 77% of farmers who use John Deere products would consider themselves as loyal to the John Deere brand. Further, what makes this statistic more interesting is that this percentage does not vary across revenue boundaries; this percentage was at 77% when looking at John Deere's farmers with less than one million dollars in annual revenues, whereas it was 78% when looking at John Deere's farmers with more than one million dollars in annual revenues. This percentage is higher when looking at the category of "desire to buy the same brand as primary equipment in new purchases" -- around 84%. According to the testimonials of a multitude farmers, some of the reasons why they have stuck with John Deere include the family business having already used John Deere for years, simple and effective products, 40+ years of dependability and life resale value, compatibility, great customer service and more. Especially in the Midwestern United States, another great reason is the sheer number of dealers in the area.

In the study, farmers stated they would switch to a different brand of agricultural products if it had better parts availability, better dealer service and repair, and finally better product engineering. However, this is unlikely. To begin with, John Deere's integration with their other products, as well as technology solutions, makes for top notch product engineering. For instance, the smart technology available through Deere products allows farmers to monitor harvest and machine conditions from apps, allowing for a lower number of total hours on any given machine. Furthermore, the aforementioned rear/forward distribution strategy also helps with one of the key factors that the farmers mentioned in their testimonial: parts availability. Finally, John Deere offers all individuals dependable warranties and has the largest dealer network in the US meaning that solving issues is never a problem.

What however is most important to understand is that John Deere is a true legacy play. Just like how there are Coke and Pepsi families, there are John Deere families who have been customers of the company for generations. Tradition runs deep in the farming industry, and John Deere capitalizes on this by being marginally better than any other company. Nobody has any reason to switch and the inertia to do so is greater than with other products because John Deere is a staple of their lives.

Prioritization of Farming Efficiency Technology and Automation

The Construction Machinery and Agricultural Equipment Manufacturing industries, which Deere operates within are set for high growth potential in the future. This growth can be explained by the pending development broader automation and machine intelligence during production. This development is possible due to digital solutions and hardware & software technology stacks which will result in better productivity and lower operating costs. Additionally, Deere has also revealed new autonomous farming products which are becoming a hot area in the farming industry.

A large part of Deere's production process depends on welding, which is a complicated process that requires close inspection. Deere partnered with Intel to develop an AI solution that helps the production of their high-quality machines more efficiently than ever before. This solution uses cameras and machine vision to examine the porosity during welding with precision that cannot be matched by a trained auditor. By leaning into the AI and machine vision space, Deere is embracing their core values of innovation and quality. As they continue to adopt more digital solutions that enhance their production line, we will be able to see a far more profitable future for the company.

Some of Deere's new products which they announced recently was their autonomous electric tractor and an autonomous drone sprayer. Both of these brand-new technologies are revolutionizing the farming industry by improving access and efficiency. As Deere consistently spends capital on research for these new technologies in the farming space, it should be interesting to see where they go in the future.

Investment Risks

Cyclicality of construction and agriculture industries

The construction and agriculture industries are currently in the midst of a rebounding period following the pandemic. As a result, revenue growth might not be as high following 2021 and 2022. Furthermore, there is some degree of uncertainty regarding demand for bulldozers and tractors in the future due to vast, industry-wide automation. Therefore, in order to properly mitigate this risk, John Deere will have to effectively pivot before automation is the industry norm. Throughout the pandemic, the world experienced a seemingly permanent shift from in-person work environments to remote work environments; while this shift/translation is not as seamless for the construction and agriculture industries, the usage of automation will eventually make it so that family farms do not have to drive the machinery themselves. While John Deere, as stated earlier, is already expending capital towards research and development in the field of AI in relation to farming, it is difficult to stay ahead of the societal curve of the cyclicality in industrialization.

Success of niche acquisitions

Over the past decade, Deere & Company has started to engage in strategic acquisitions that not only benefit the technological ecosystem that Deere is attempting to develop, but also niche areas in overseas markets. For example, John Deere recently acquired a Brazilian company named Unimil for $66 million—this company specializes in aftermarket parts for sugarcane harvesters. While this may be a vital acquisition for Deere—one that they are willing to pay a premium for—there is no doubt that the impact that these types of acquisitions will have on Deere's international market is unclear. For proper mitigation, it is important to recognize that the majority of John Deere's revenue growth is organic, and while some acquisitions may not be the most successful, they will only continue to add to Deere's diverse product portfolio with added distribution centers.

Valuations

DCF Assumptions

- Cost of Equity Assumptions
  - Beta = 0.71, unlevered/re-levered
  - Risk free rate = 1.6%
  - Rate of Market Return = 8.5%
  - Market Risk Premium = 4%
- **Implied Cost of Equity = 6.5%**
- WACC Assumptions
  - % debt = 35.5%
  - % Equity = 64.5%
  - Cost of Equity = 6.5%
  - Cost of Debt = 0.7%
- **Implied WACC = 4.4%**
- Additional Assumptions and Figures
  - Share Price = $358.00
  - Shares Outstanding = 316 million
  - Terminal Growth Rate = 2%
  - EV/EBIT Exit Multiple = 20.1x
  - Terminal Shares Outstanding: 310 million

Historicals					
Year:	2016	2017	2018	2019	2020
Revenue Growth:	-8.0%	9.5%	28.4%	5.1%	-9.5%
EBIT Margin:	8.9%	10.1%	11.1%	11.0%	12.8%
CapEx (% of rev):	-11.1%	-8.9%	-7.9%	-8.8%	-7.5%
D&A (% of rev.)	5.5%	5.5%	4.8%	4.8%	5.6%
NWC	$ 19,254.50	$ 17,831.20	$ 20,874.00	$ 23,326.00	$ 24,324.00
Change in NWC	$ 2,318.22	$ (1,423.30)	$ 3,042.80	$ 2,452.00	$ 998.00
Change in NWC (% of rev):	8.73%	-4.90%	8.15%	6.25%	2.81%

Assumptions					
Terminal Growth Rate:	2.0%	EV/EBIT Exit Multiple:	20.1x	Terminal Shares Outstanding:	310
Year:	2021	2022	2023	2024	2025
Revenue:	19.0%	15.0%	12.0%	9.0%	8.0%
EBIT Margin:	13.0%	12.5%	12.0%	11.0%	10.0%
CapEx (% of rev)	-8.5%	-4.0%	-3.0%	1.5%	4.8%
D&A (% of rev)	5.5%	5.3%	5.3%	5.0%	4.8%
Changes in NWC (% of rev)	3.0%	3.0%	2.5%	2.5%	2.0%
Tax Rate	24.9%	24.9%	24.9%	24.9%	24.9%

Exhibit 3: Deere Historicals and Base Assumptions

Implied Fair Value					
Enterprise Value:	$ 176,515.79	-	$ 147,199.98		
Implied Equity Value:	$ 136,952.79	-	$ 107,636.98	Avg:	Upside/Downside:
Implied Share Price:	$ 441.78	-	$ 347.22	$ 394.50	10.20%
Implied Upside:	23.4%	-	-3.01%		
	Gordon Growth Method		Exit Multiple Method		

Exhibit 4: DCF Model: Base Case

Exit Multiple

		EV/EBIT						
	$347.10	**17**	**18**	**19**	**20**	**21**	**22**	**23**
WACC	**3.50%**	$305.56	$324.74	$343.92	$363.09	$382.27	$401.45	$420.62
	3.75%	$300.98	$319.93	$338.87	$357.82	$376.77	$395.71	$414.66
	4.00%	$296.46	$315.18	$333.90	$352.62	$371.34	$390.06	$408.78
	4.25%	$292.00	$310.49	$328.99	$347.49	$365.98	$384.48	$402.98
	4.50%	$287.60	$305.87	$324.15	$342.43	$360.70	$378.98	$397.26
	4.75%	$283.26	$301.32	$319.38	$337.44	$355.50	$373.56	$391.62
	5.00%	$278.98	$296.82	$314.67	$332.52	$350.36	$368.21	$386.05
	5.25%	$274.76	$292.39	$310.03	$327.66	$345.30	$362.93	$380.56
	5.50%	$270.59	$288.02	$305.45	$322.87	$340.30	$357.73	$375.15

Gordon Growth

		Terminal Growth Rate						
	$440.55	**1.00%**	**1.25%**	**1.50%**	**1.75%**	**2.00%**	**2.25%**	**2.50%**
WACC	**3.50%**	$436.65	$488.70	$553.76	$637.40	$748.93	$905.06	$1,139.27
	3.75%	$389.44	$431.62	$483.16	$547.59	$630.43	$740.89	$895.53
	4.00%	$350.06	$384.87	$426.64	$477.69	$541.50	$623.55	$732.95
	4.25%	$316.70	$345.87	$380.34	$421.71	$472.28	$535.48	$616.75
	4.50%	$288.07	$312.83	$341.73	$375.87	$416.85	$466.93	$529.53
	4.75%	$263.23	$284.48	$309.01	$337.63	$371.45	$412.04	$461.65
	5.00%	$241.46	$259.88	$280.94	$305.24	$333.59	$367.09	$407.29
	5.25%	$222.23	$238.33	$256.58	$277.44	$301.51	$329.59	$362.77
	5.50%	$205.11	$219.29	$235.24	$253.32	$273.98	$297.82	$325.63

Exhibit 5: DCF Model: WACC Sensitivity Analysis

		Bear Assumptions			
Terminal Growth Rate:	1.5%	**EV/EBIT Exit Multiple:**	19.0x	**Terminal Shares Outstanding:**	310
Year:	2021	2022	2023	2024	2025
Revenue:	13.0%	12.0%	11.0%	9.0%	7.0%
EBIT Margin:	13.0%	12.5%	12.0%	11.0%	10.0%
CapEx (% of rev)	-8.5%	-4.0%	-3.0%	1.5%	4.8%
D&A (% of rev)	5.5%	5.3%	5.3%	5.0%	4.8%
Changes in NWC (% of rev)	3.0%	3.0%	2.5%	2.5%	2.0%
Tax Rate	24.9%	24.9%	24.9%	24.9%	24.9%
		Implied Fair Value			
Enterprise Value:	**$ 132,344.69**	-	**$ 123,487.33**		
Implied Equity Value:	**$ 92,781.69**	-	**$ 83,924.33**	**Avg:**	**Upside/Downside:**
Implied Share Price:	**$ 299.30**	-	**$ 270.72**	**$ 285.01**	**-20.39%**
Implied Upside:	**-16.4%**	-	**-24.38%**		
	Gordon Growth Method		**Exit Multiple Method**		

Exhibit 6: DCF Model: Bear Case

		Bull Assumptions			
Terminal Growth Rate:	2.3%	**EV/EBIT Exit Multiple:**	21.0x	**Terminal Shares Outstanding:**	310
Year:	2021	2022	2023	2024	2025
Revenue:	19.0%	17.0%	13.0%	12.0%	10.0%
EBIT Margin:	13.0%	12.5%	12.0%	11.0%	10.0%
CapEx (% of rev)	-8.5%	-4.0%	-3.0%	1.5%	4.8%
D&A (% of rev)	5.5%	5.3%	5.3%	5.0%	4.8%
Changes in NWC (% of rev)	3.0%	3.0%	2.5%	2.5%	2.0%
Tax Rate	24.9%	24.9%	24.9%	24.9%	24.9%
		Implied Fair Value			
Enterprise Value:	**$ 203,092.57**	-	**$ 159,164.99**		
Implied Equity Value:	**$ 163,529.57**	-	**$ 119,601.99**	**Avg:**	**Upside/Downside:**
Implied Share Price:	**$ 527.51**	-	**$ 385.81**	**$ 456.66**	**27.56%**
Implied Upside:	**47.4%**	-	**7.77%**		
	Gordon Growth Method		**Exit Multiple Method**		

Exhibit 7: DCF Model: Bull Case

	TEV/Total Revenue	TEV/EBITDA	P/Diluted EPS
Caterpillar Inc. (NYSE:CAT)	3.7	19.8	38.5
CNH Industrial N.V. (NYSE:CNHI)	1.3	16.8	
AGCO Corporation (NYSE:AGCO)	1.3	11.2	22.6
PACCAR Inc (NasdaqGS:PCAR)	2	17.8	23.3
The Toro Company (NYSE:TTC)	3.7	21.8	34.4
Kubota Corporation (TSE:6326)	2.1	16.3	24.9
Terex Corporation (NYSE:TEX)	1.4	18	52.2
Lindsay Corporation (NYSE:LNN)	3.7	22.6	42.7
Low	1.3	11.2	22.6
Median	2.05	17.9	34.4
Mean	2.4	18.0375	34.08571429
High	3.7	22.6	52.2
Deere & Company (NYSE:DE)	4.4	24.6	36.1
Implied EV	$188,483.76		
Implied Equity Value	$126,336.76		
Shares Outstanding	316		
Implied Share Price	$399.80		
Implied Upside/Downside	11.68%		

Exhibit 8: Comparable Companies Analysis

Spring 2021
Promontory Investment Research
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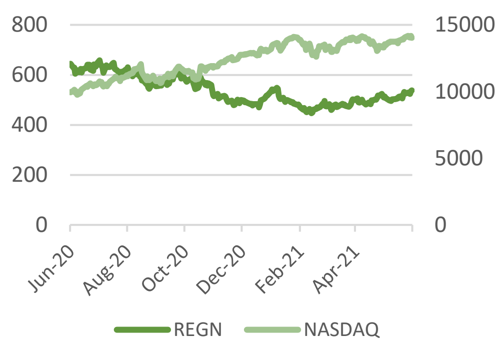
Regeneron Pharmaceuticals

Regeneron Pharmaceuticals | NYSE: REGN	
Negative Neutral	**Positive**
Share price, 09/21/18:	$502.43
Market capitalization:	$53.52 B
Shares outstanding:	104.67 M
52-week range:	$441.00 / $664.64
EPS (FY17):	$35.13
Beta	0.19
Average analyst opinion:	$628.36

Price Chart



Financial Highlights

(Dollars in millions)	**2018**	**2019**	**2020**
Revenue	5145.6	6557.6	8310.4
% Growth	*-12%*	*27%*	*27%*
EBITDA	2682.6	2455.3	3530.8
% Payout	*52.1%*	*37.4%*	*42.5%*

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Investment Overview

We recommend a **BUY** rating for Regeneron Pharmaceuticals (NYSE: REGN). Firstly, the company focuses specifically on organic growth. Its strong product portfolio including the blockbuster drug Eylea and various other drugs allows Regeneron to capture large market shares across various therapeutic areas. Furthermore, our pipeine index demonstrates that Regeneron's suite of proprietary technologies (*VelociSuite technologies*) streamlines its drug development process such that it is more efficient than competitors of similar market cap. Lastly, the development and global distribution of REGN-Cov, a COVID-19 medicine, provides Regeneron not only with substantial revenue in the coming year, but also expanded manufacturing capabilities and a meaningful partnership with Roche.

Company Overview

Regeneron was founded in 1988 by neurologist Leonard S. Schleifer from Cornell Medical and is based in Westchester County, NY. It first became publicly traded in 1991, raising $91.6 M in IPO. Initially primarily focused on neurotrophic factors which promote nerve growth via gene technology.

Regeneron entered collaboration with Sanofi-Aventis in 2003 to develop VEGF Trap technology to treat wet-age macular degeneration and partnered with Bayer to expand VEGF Trap internationally. Regeneron's continual partnerships with Sanofi and Bayer has also yielded many successful product launches, though there is currently a partnership restructuring between Regeneron and Sanofi. Regeneron also partners with many other biotech companies such as Intellia and Adicet Bio to develop more experimental products using novel technologies such as CRISPR gene editing.

M&A and News

Regeneron has maintained a wary stance towards mergers and acquisitions. President and CEO Leonard Schleifer remarked, "Regeneron is unlikely to do deals, buy back shares, or hike drug prices… We are not nearly as desperate as the companies are to fill up eps in the pipeline," in a press interview. According to Schleifer, the company refrains from m&a activity as it prefers to rely on organic growth from product development to drive revenue rather than inorganic growth from mergers and acquisitions. Additionally, in this sector where there are many mergers and acquisitions that result in an additional premium being paid, the company prefers to invest money in research and development. Most recently, The French pharmaceutical company Sanofi sold its $12 billion stake in Regeneron in 2020.

In place of M&As, Regeneron focuses on licensing agreements, collaborations, and partnership agreements with other companies. Currently, it holds collaborations with Teva, Mitsubishi Tanabe Pharma Corp, Bayer and Sanofi.

Pipeline

Antibody Focus

Regeneron's pipelines target a range of medical ocnditions, including diseases related to ophthalmology, immunology, and oncology. Compared to its competitors, however, Regeneron's pipeines are quite specialized. Whereas competitors use a variety of drug classes such as small molecues, biologics, and cell therapy in their pipelines, Regeneron focuses specifically on using antibodies to target various disease agent. This degree of specialization effectively gives Regeneron an edge in the antibody-drug development process.

VelociSuite Technologies

To make the traditional R&D process more efficient, Regeneron has developed a series of proprietary technology grouped under VelociSuite to accelerate the antibody-drug discovery and development process. An example is the VelociGene technology, which allows for the automated manipulation of mouse DNA, increasing the speed and capacity for the testing of therapeutic targets. Regeneron also owns patents covering these technologies, effectively giving them a competitive edge in the efficiency and speed at which drugs in pipelines are developed.

Business Lines

Regeneron currently sells 8 FDA approved medicines for those with serious diseases – including eye, allergic/inflammatory, cardiovascular, metabolic, infectious, & rare diseases, and cancer – Arcalyst, Dupixent, EYLEA, Libtayo, Kevzara, Praulent, REGEN-COV, and Zaltrap. ARCALYST treats cyropin-associated periodic syndromes (heart disease), Dupixent provides treatment for atopic dermatitis, asthma, and chronic rhinosinusitis with nasal polyposis (allergic/inflammatory diseases), ELYEA treats wet age-related macular degeneration and macular edema (eye diseases), Keyzara treats rheumatoid arthritis, Libtayo treats cutaneous squamous cell carcinoma (skin cancer), Praulent treats treats/reduces risks associated with cardiovascular disease, Zaltrap treats metastatic colorectal cancer, and REGEN-COV provides a treatment for those who test positive for Covid-19 and are at particularly high risk for complications or severe symptoms. In addition,

Industry Overview

Regeneron operates in the pharmaceutical manufacturing industry, which specializes in the development of drugs to prevent and treat illnesses. In 2020, the industry was valued at $357.9 billion and has a CAGR of 5% from 2021 to 2026. As the global population continues aging pharmaceuticals are expected to be in increased demand and result in growth for the industry. The coronavirus pandemic also boosted spending on pharmaceuticals products.The pharmaceutical industry is large with many players that are competing for customers. A few notable competitors of Regeneron are Sanofi, Amgen, Ctalent, Bristol-Myers Squibb, Biogen, Gilead Sciences, Novartis, and Vertex Pharmaceuticals.

Regeneron's Duxpient drug still demonstrates a high potential for upside as there are currently no competitors for it. The main competitor for Regeneron's Eylea medicine is coming from Novartis which has been threatening Eylea's market stake through their Lucentis and Beovu drugs. One of Regeneron's newer drugs that has been getting approval is Libtayo. However, this is similar to Keytruda from Merk and Opdivo from Bristol-Myers Squibb. This is a common trend in the pharmaceutical industry where drug makers will try to compete with an existing drug that is demonstrating rapid success.

Covid-19

Covid-19 has created a valuable opportunity in the biotechnology industry. According to the Milken Institute, there are 252 vaccines and 326 treatments in development. Almost every major biotechnology company has attempted to develop a treatment or vaccine for COVID-19 creates a highly competitive environment. The pandemic has also led to lower than normal medical visits that are unrelated to COVID-19. This has had a negative effect on the medical industry due to fewer operations and prescriptions. In the future as in person visits and schedule operations increase back to pre-covid levels the industry should see an increase in revenue for those areas. At the same time the boost in revenue due to the coronavirus will slowly reduce and companies will have to prioritize their long-term pipelines to sustain revenue growth.

Biotech Industry Features

Clinical Trials
Another critical and unique aspect of the medical biotech industry is the enormous barrier that is the FDA. The FDA (Food and Drug Administration), is responsible for ensuring that the products that many biotech companies seek to produce are safe and effective. This process of product screening is known as clinical trials. There are four phases of clinical trials that a drug must go
through before approval which checks for safety, optimal dosage, ability to perform, and effectiveness relative to competitors. On average, clinical trials take six to seven years and tens or hundreds of millions of dollars to fund. Along with an extremely high rate of failure (around 90%), clinical trials are the ultimate gatekeeper for biotech companies seeking to bring a product to market and are primarily responsible for the enormous volatility of the industry.
Regeneron currently has 37 pipeline products evenly distributed throughout various clinical phases and 8 products on the market.

Patent cliffs: drugs used years ago begin to lose their patent exclusivity, providing an opportunity for biosimilar or generic drugs. This requires pharmaceuticals to constantly innovate in their product lines and develop new drugs that can obtain exclusive access to markets.

Regeneron also shares partnerships with many other companies who produce and record sales for their drugs in foreign markets. This is a common trend in the industry where they receive a portion of the profits from all sales. Larger biopharma and pharamaceutical companies often finance smaller biotech companies often without products of their own to jointly develop and research new pipeline products using their proprietary technology. For example, Regeneron is currently partnered with Intellia Therapeutics, a biotech company that specializes in developing medicines using novel CRISPR-Cas9 technology.

Investment Theses

Organic growth driven by existing products

Regeneron's revenue is driven by the drugs Eylea and Dupixent. Both drugs contribute significantly to Regeneron's revenue growth, and this trend is expected to continue in the foreseeable future.

Eylea

Eylea is a treatment for Wet Age-related Macular Degeneration (AMD), which is the leading cause of severe, permanent vision loss in people over the age of 60. Currently, it is estimated that as many as 11 million people in the United States have developed some form of age-related macular degeneration. Since AMD is positively correlated with age, the aging world population will likely increase the cases of AMD. In particular, the number of people with AMD in the U.S. is expected to double to nearly 22 million by 2050, and the number of people worldwide with AMD is expected to increase from 196 million in 2020 to 288 million by 2040. As one of the primary medications used to treat AMD, the growth of Eylea sales and revenue is promising. We can already see this through the 6.5% increase in the product's net sales from $4.644 billion to $4.947 billion from FY2019 to FY2020.

Eylea faces two competitor drugs: Lucentis and the off-label use ("unapproved use of an approved drug") of Avastin. The biology behind all three drugs are very similar, but Eylea retains a competitive edge over both drugs for two reasons. Firstly, since Avastin was originally used to treat colon cancer, the specificity of Eylea towards treating AMD means that physicians prefer to use Eylea over the off-label Avastin. In fact, according to a survey conducted by Pharmaceutical Technology, the majority (60%) of ophthalmologists in the U.S. expect to prescribe Eylea to more patients over the next two years. Furthermore, Eylea holds a competitive advantage over Lucentis due to the lessened frequency of treatment. Eylea injections are required 6 to 8 times a year while Lucentis is administered on a monthly basis. This means that Eylea provides physicians with a lower annual cost of therapy compared to Lucentis, giving it a competitive advantage over Lucentis for its cost-effectiveness and increased convenience.

Dupixent

Dupixent is an injection treatment for severe atopic dermatitis (AD, a form of eczema) that is not well controlled with prescription therapies used on the skin. The product was developed in collaboration with Sanofi, and first received FDA approval in March of 2017. Most recently, it was approved for children aged 6 to 11 years in May of 2020. Dupixent is a promising driver of Regeneron's future growth since it is the first biologic to be approved for adults who have moderate to severe eczema. This effectively means that Dupixent is the only available treatment for those who do not respond to normal forms of AD therapies, allowing it to capture a large market share. We have approximated the size of this market by looking at a national study conducted by the National Eczema Association, which found that moderate-to-severe AD affects 17 million people in the U.S.

Moreover, in the short-term, we do not expect biosimilar biologics to be developed by competitors, and such limited competition will ensure the growth of Dupixent. Furthermore, Regeneron is expanding the scope of the drug as an add-on treatment for children with uncontrolled moderate to severe asthma, currently in phase 3 of the pipeline. If approved, net sales of Dupixent will likely increase accordingly, further driving its revenue growth. Additionally, Dupixent acts as a treatment for Type 2 COPD (severe immune response), which is mainly caused by tobacco smoke but may also be caused by exposure to air pollutants & respiratory infections. 16 million Americans suffer from COPD, which oscillates between the 3rd and 4th leading cause of death in the United States.

Proprietary technology (VelociSuite) drives efficiency in the drug development process, giving Regeneron's pipeline a competitive advantage over others.

Regeneron's VelociSuite technologies allow the company to develop drugs in a streamlined process, accelerating its pipeline development process and increasing its overall efficiency. Since it is a proprietary platform, it prevents competitors from accessing the set of technologies making it a valuable asset to Regeneron. At the same time, however, we recognize that competitors likely possess their own sets of technologies that improve the traditional drug development process. For this reason, we have developed three pipeline indexes to quantify and demonstrate the effectiveness of Regeneron's VelociSuite technology relative to its competitors. It is important to note that we have generalized over many factors such as the market of each individual drug or the likelihood of it arriving at the approval stage. However, these indexes give us a rough picture of a company's overall pipeline health with respect to its R&D costs and revenue and gives us a quantitative method of benchmarking companies with each other.

We can compare biotech companies by three indexes:

1. **Efficiency:** *R&D / p3pp index.* This ratio measures how much on average it takes for a company to bring a p3pp to that stage and hence the efficiency of a company at utilizing its R&D costs. As such, a higher R&D / p3pp index would indicate that a company needs more spending to research and develop new products.

2. **Burden**: *Revenue / p3pp (phase 3 pipeline products) index*, which gives a measure of how much burden is placed on each pipeline product to generate future revenue for the company. In other words, it is a representation of the average potential of a company's pipeline products and serves as an indicator of the company's pipeline health. A higher revenue / p3pp value indicates that the average p3pp would have to take on more future revenue burden and as such, is less healthy than a company with lower revenue / p3pp value. This index can also be used to evaluate the speed and success rate of a company in developing its pipeline products. Suppose two companies with similar revenue have dramatically different burden values. As such, one company must have significantly more p3pps than its competitor. This can arise through said company having a greater success rate in previous clinical trials or being able to bring new pipeline products through clinical trials more quickly.

3. **Excellence:** *Revenue/ current products index*. This index gives a measure of the average excellence of a company's current product portfolio. A higher revenue / current products ratio indicates that each product is on average generating more revenue for the company relative to its competitors. This also means that the company's products in general can generate high revenue, offsetting potential low efficiency and burden indexes.

We see that Regeneron does indeed have a competitive advantage when it comes to pipeline development:

	Efficiency (avg (5) R&D / p3pp)	**Burden** (avg (5) revenue / p3pp)	**Excellence** (avg (5) revenue / current products)
Regeneron (52.92b)	**310.04**	**740.39**	**740.39**
Biogen (41.26b)	436.52	1771.05	817.41
Gilead (83.78b)	485.47	2750.36	825.11
Bayer (64.44b)	661.03	4791.13	361.59
Vertex (55.66b)	368.64	880.35	880.35
Alexion (37.67b)	121.1	623.44	872.82
Seagen (25.31b)	232.27	147.39	196.52
Average	**384.17**	**1827.28**	**658.97**

From the data above, we can see that Regeneron's efficiency index is lower than the average of its competitors, indicating that its pipeline development process is more efficient than comparable companies. In other words, on average, compared to its competitors, Regeneron requires less R&D cost for each pipeline product to be developed. Furthermore, Regeneron has a significantly lower burden index than its competitors. This means that its pipeline is relatively healthy, with each pipeline product carrying less of a revenue burden. The lower burden value also indicates that Regeneron can bring its products through clinical trials more quickly and/or at a higher success rate than its competitors. Lastly, Regeneron has a higher excellence index relative to its competitors, meaning that on average, each of its products can generate more revenue than its competitors. Since the pipeline development process is driven largely by its technologies, we can conclude that Regeneron's VelociSuite technologies are indeed effective in reducing pipeline cost and bolstering pipeline health and efficiency. This demonstrates that Regeneron has strong core capabilities that will allow it to excel in the long run.

Short-term growth driven by Covid-19 drug

With the emergence of the Covid-19 pandemic, the FDA gave emergency approval of REGEN-COV, a drug designed to reduce symptoms of those infected with Covid-19. The Covid-19 treatment market is enormous and badly in need of any products that are proven effective. As such, Regeneron has partnered with Roche to expand manufacturing capacity and distribution to worldwide markets should Phase 3 clinical trials show positive results. In particular, the EU and India recently approved the use of REGEN-Cov, further expanding the global market for the drug. The success of REGEN-COV strongly depends on how the pandemic proceeds in the coming months / year(s). We predict that Covid-19 will remain a critical threat to society with many more cases for around a year. So far only 1.27 billion vaccine doses have been administered and many countries are still suffering from large COVID outbreaks. India, which as a population of 1.366 billion, has only had less than 10% of the population receive their first dose of the vaccine. Currently the country has a 7-day average of 400,000 new covid cases a day. At the current rate of vaccine production, it is expected to take upto 4 more years until global herd immunity is accomplished. As such, only manufacturing capacity during this period will be a limiting factor for Regeneron in commercializing REGEN-COV. This period could prove extremely profitable for Regeneron, as the US Government has already purchased up to 1.25 million additional doses in the future (worth $2.625 billion). Along with relatively few competitors in the field and potential long run viability for occasional treatments of the immunocompromised or elderly, REGEN-COV is well poised to take advantage of the Covid-19 market. Regeneron's large investments into manufacturing capacity may also be repurposed for other product manufacturing and as such, will not necessarily vanish once use of REGEN-COV has diminished after the pandemic.

Investment Risks

Patent expiration for Eylea

Eyelea currently accounts for more than 50% of Regeneron's revenue (55% in Q4 2020). The US patent for Eylea is set to expire in 2023 and the European patent is set to expire in 2025. This can result in a drop in revenue due to the introduction of generic medicines. In addition, companies like Biogen and Novartis are eyeing other wet-AMD treatments to compete with Regeneron after the patent expires.

Mitigation: Regeneron is developing a high-dosage EYLEA to extend patent by another 10 years. Along with that, Libtayo and Dupixent sales are increasing, making up for the possible decline in EYLEA revenue.

Valuation

DCF Model

	Historical Period					Projection Period				
Line Item	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Revenue	4741.40	5872.20	5145.60	6557.60	8310.40	11219.04	13350.66	14685.72	15860.58	16970.82
% growth	*-%*	*24%*	*-12%*	*27%*	*27%*	*35%*	*19%*	*10%*	*8%*	*7%*
EBIT	1330.70	2079.60	2534.40	2245.00	3294.90	3926.66	4672.73	5140.00	5551.20	5939.79
% margin	*28%*	*35%*	*49%*	*34%*	*40%*	*35%*	*35%*	*35%*	*35%*	*35%*
Effective Tax Rate	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%
NOPAT	**1051.25**	**1642.88**	**2002.18**	**1773.55**	**2602.97**	**3102.06**	**3691.46**	**4060.60**	**4385.45**	**4692.43**
(+) D&A	104.70	145.50	148.20	210.30	235.90	336.57	400.52	587.43	634.42	848.54
% revenue	*2%*	*2%*	*3%*	*3%*	*3%*	*3%*	*3%*	*4%*	*4%*	*5%*
(-) Capex	511.90	272.60	383.10	429.60	614.80	785.33	934.55	881.14	951.63	848.54
% revenue	*11%*	*5%*	*7%*	*7%*	*7%*	*7%*	*7%*	*6%*	*6%*	*5%*
NWC	2806.98	3023.98	4309.20	5186.10	6409.80	-	-	-	-	-
(-) Change in NWC	-	217.00	1285.22	876.90	1223.70	1682.86	2002.60	2202.86	2379.09	2545.62
Change as % of revenue	-	*4%*	*25%*	*13%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*
Unlevered Free Cash Flow	-	1298.78	482.06	677.35	1000.37	970.45	1154.83	1564.03	1689.15	2146.81
% growth	-	-	*-63%*	*41%*	*48%*	*-3%*	*19%*	*35%*	*8%*	*27%*
Discounted Cash Flow						932.09	1065.34	1385.80	1437.51	1754.77

Weighted Average Cost of Capital

Current Share Price	$506.72
Shares Outstanding	104.67
Market Capitalization	$53,038.38
Total Debt	2,520.50
Cash & Cash Equivalents	2,193.70
Net Debt	326.80
Percent Equity	95%
Percent Debt	5%
Risk-Free Rate	3.10%
Beta	0.19
Equity Risk Premium	5.78%
Cost of Equity	4.19820%
Cost of Debt	3%
Tax Rate	21%
WACC	4%

Sensitivity Analysis: WACC vs. Perpetuity Growth Rate

71.3%	3.0%	3.5%	4.0%	4.5%	5.5%	6.0%
1.6%	32.7%	-7.5%	-30.9%	-46.3%	-65.1%	-71.4%
1.8%	56.9%	4.8%	-23.5%	-41.4%	-62.6%	-69.4%
2.0%	90.6%	20.4%	-14.7%	-35.7%	-59.7%	-67.3%
2.2%	141.3%	40.8%	-3.8%	-29.1%	-56.6%	-64.9%
2.4%	225.7%	68.6%	9.7%	-21.1%	-53.0%	-62.2%

	Bear Case Projection Period				
	2021	2022	2023	2024	2025
Revenue	10803.52	12424.05	14952.74	16448.01	17129.43
% growth	*30%*	*15%*	*12%*	*10%*	*8%*
EBIT	3241.06	3727.21	4485.82	4934.40	5138.83
% margin	*30%*	*30%*	*30%*	*30%*	*30%*
Effective Tax Rate	21%	21%	21%	21%	21%
NOPAT	**2560.43**	**2944.50**	**3543.80**	**3898.18**	**4059.67**
(+) D&A	216.07	248.48	448.58	493.44	685.18
% revenue	*2%*	*2%*	*3%*	*3%*	*4%*
(-) Capex	648.21	745.44	747.64	822.40	685.18
% revenue	*6%*	*6%*	*5%*	*5%*	*4%*
NWC	-	-	-	-	-
(-) Change in NWC	1620.53	1863.61	2242.91	2467.20	2569.41
Change as % of revenue	*15%*	*15%*	*15%*	*15%*	*15%*
Unlevered Free Cash Flow	507.77	583.93	1001.83	1102.02	1490.26
% growth	-49%	-40%	-13%	-30%	-12%
Discounted Cash Flow	487.70	538.68	887.67	937.84	1218.12

Bear Case: Revenue Assumptions: Covid-19 Pandemic not as profitable as projected, Eyelea patent expires 2023, Unusual failure rate of pipeline products, CapEx and D&A decrease as organic growth slows compared to base case

Implied Premium: 17.8%

	Bull Case Projection Period				
	2021	2022	2023	2024	2025
Revenue	11634.56	15124.93	18906.16	22687.39	26544.25
% growth	*40%*	*30%*	*25%*	*20%*	*17%*
EBIT	4072.10	5293.72	6617.16	7940.59	9290.49
% margin	*35%*	*35%*	*35%*	*35%*	*35%*
Effective Tax Rate	21%	21%	21%	21%	21%
NOPAT	**3216.96**	**4182.04**	**5227.55**	**6273.06**	**7339.48**
(+) D&A	465.38	605.00	945.31	1134.37	1592.65
% revenue	*4%*	*4%*	*5%*	*5%*	*6%*
(-) Capex	930.76	1209.99	1323.43	1588.12	1592.65
% revenue	*8%*	*8%*	*7%*	*7%*	*6%*
NWC	-	-	-	-	-
(-) Change in NWC	1745.18	2268.74	2835.92	3403.11	3981.64
Change as % of revenue	*15%*	*15%*	*15%*	*15%*	*15%*
Unlevered Free Cash Flow	1006.39	1308.31	2013.51	2416.21	3357.85
% growth	*1%*	*30%*	*54%*	*20%*	*39%*
Discounted Cash Flow	966.61	1206.93	1784.06	2056.25	2744.66

Bull Case: Revenue Assumptions: Covid-19 pandemic will be more profitable than projected, development of high-dosage Eylea patent to expand it until 2033, pipeline product success

Implied Premium: 165%

Comparables Model

Company Name	Stock Price	Shares Outstanding(mm)	Market Cap (mm)	Enterprise Value	Revenue	EV/Revenue	EBITDA	EV/EBITDA	P/B
Regeneron	$506.72	103.6	52,472.1	48,123.3	9,010.9	5.34x	3,950.0	12.18x	4.51x
Biogen	$283.10	150.6	42,635.6	46,904.4	12,604.3	3.72x	4,140.0	11.33x	3.97x
Gilead	$68.75	1254.2	86,224.7	109,084.7	25,564.0	4.27x	13,290.0	8.21x	4.53x
Bayer	$17.03	3930	66,870.0	102,980.2	49,873.6	2.06x	10,410.0	9.89x	1.79x
Vertex	$213.43	258.87	55,250.0	49,220.0	6,410.0	7.68x	3,140.0	15.68x	6.15x
Alexion	$177.72	221.02	38,620.0	37,860.0	6,260.0	6.05x	3,260.0	11.61x	3.11x
Seagen	$153.34	181.48	26,980.0	24,510.0	2,270.0	10.8x	648.5	37.8x	7.88x

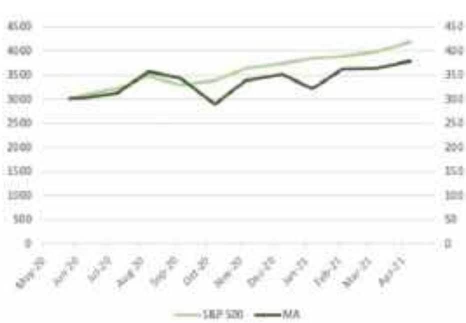
Percentile	Market Cap (mm)	Enterprise Value	Revenue	EV/Revenue	P/B	P/B
25%	40,627.8	42,382.2	6,335.0	3.99x	3.54x	10.61x
50%	52,472.1	48,123.3	9,010.9	5.34x	4.51x	11.61x
75%	61,060.0	76,100.1	19,084.2	6.86x	5.34x	13.93x
Mean	**52,721.8**	**59,811.8**	**15,999.0**	**5.7x**	**4.56x**	**15.24x**
Regeneron	**52,472.1**	**48,123.3**	**9,010.9**	**5.34x**	**4.51x**	**12.18x**
Value using 50th percentile				$541.06	$512.66	$633.96
Upside:				6.78%	1.17%	25.11%

Spring 2021
Promontory Investment Research
http://www.promontoryir.com

Mastercard Inc. (NYSE: MA)

Mastercard Inc. | NYSE: MA	
Negative Neutral	**Positive**
Share price, 05/06/21:	$375.40
Market capitalization:	$372,772mm
Shares outstanding:	993mm
52-week range:	$401.50 / $381.20
EPS (FY20):	$6.37
Beta	1.01
Average analyst opinion:	$428.57
Price target:	$404.32

Price Chart



Financial Highlights

(Dollars in millions)	2018	2019	2020
Revenue	14,950	16,883	15,301
% Growth	*19.6%*	*12.9%*	*-9.4%*
EBITDA	8,877	10,189	8,742
% Margin	*59.4%*	*60.4%*	*57.1%*
EV/EBITDA	42.2x	36.4x	42.5x
% Decrease	*18.4%*	*13.7%*	*-4.2%*
EPS	$7.23	$6.67	$6.37

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Investment Overview

With a targeted share price of $404.32, we are recommending a **BUY** rating for Mastercard (NYSE: MA) due to its competitive advantage in expanding into the Chinese card market, where each citizen has on average six credit cards and there are a total of eight billion cards in circulation, and its majority growing market share control of using real-time payment rails in the B2B space.

In 2020, China and the United States ended their trade war permitting entry to American payments processing firms into the Chinese market. While all American card companies will benefit from this agreement, we believe Mastercard is in the unique position to capitalize on this expansion due to its high ROIC historical percentage, nearly double of its leading competitor.

Furthermore, the B2B payments market is expected to be $25 trillion in the coming years, but currently faces issues from merchants such as late payments arising from poorly developed credit card rails. Mastercard has decided to expand into the multi-rail network to eliminate such issues through acquisitions and internal projects. Since Mastercard is the only major American payments processing in this segment, we expect the firm to capture this market as its investments begin to materialize into an increase in sales.

Company + Industry Overview

Company + Industry History

To understand the history of Mastercard, it's imperative to understand the history of credit cards, because both are inherently linked towards one another. In the late 1940s, several US banks gave their customers specially issued paper that could be used like cash in local stores. This eventually evolved into where several franchises accepted the cards as payments and many groups were formed trying to connect merchants to bankers. Founded in 1966 as the Interbank Card Association and rebranding to Mastercard, the company went public in 2006 under the ticker symbol MA. From there, Mastercard's main business is to process payments between the banks and the credit unions of buyers to the banks and credit unions of the sellers. From this, Mastercard's main product line hasn't changed significantly. They've expanded to different regions of the world, and have acquired various institutions, such as EuroPay international and Travelex, their main business of connecting merchants and bankers has remained the same. In addition, it offers other services such as debit, credit, and prepaid cards. The majority of Mastercard's revenue comes from fees paid by customers, primarily financial institutions to issue Mastercard's cards.

Business Lines

Mastercard has a unique business model, mainly profiting off transactions and fees. Mastercard classifies their revenue into four different sectors:

1. Domestic assessment fees: generated based on dollar volume fees
2. Cross-border assessment: Same as domestic assessment fees except currency conversion fees are applied for the international transaction
3. Transaction processing fees: Switch transaction fees generated both domestically and internationally
4. Other: Mixed revenue from consulting, data analytics, research, safety and security service, loyalty rewards, and program management services

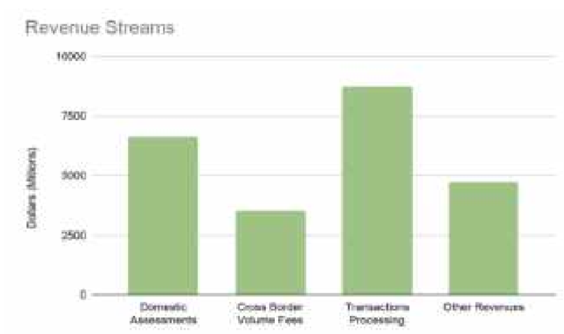
For a broader understanding, in a transaction, there are four participants: the issuing bank, the merchant, the acquiring bank, and the cardholder. Mastercard connects all four of these together in a seamless transaction. Together these four parties make up an open-loop system, which connects consumers to purchase items from a merchant easily. For each individual party, here's their role in the card scheme:

1. The Cardholder: He's the buyer. They hold the debit or the credit card offered by their bank
2. The Card Issuer: Provides the debit or credit card from the card scheme to qualifying customers. Issuers are the banks who have their own stipulations. All cards, even branded cards, have some financial institution backing them
3. The Merchant: A retailer or a business that sells good or services to the card holder
4. The Acquirer: The institution that provides a merchant service agreement to the merchant and processes the card transactions. The acquiring banks are the institutions that pay almost all of the fees. However, they also pass on fees to merchants and the consumers in bundled charges.

This is known as a card scheme, and almost all major card companies, Visa, Mastercard, American Express, and UnionPay use this method. Often, it's hard to understand which credit card fees are processed, because no one outside the card scheme knows the true figure. In essence, when Mastercard processes a payment, the banks pay a fee per transaction to Mastercard and takes a percentage of the gross dollar volume (the amount of money being processed) from the provider. Currently, Mastercard's revenue is around $15 billion USD.

Revenue Streams Analysis

To the right, you can see a rough breakdown of Mastercard's revenue streams. Overall, we can see that the majority of Mastercard's revenue comes from simply processing transactions and the fees charged with it. However, their cross-border volume fees are expected to grow significantly in the upcoming day, as their expansions into China might prove to be successful.



Competitor Landscape

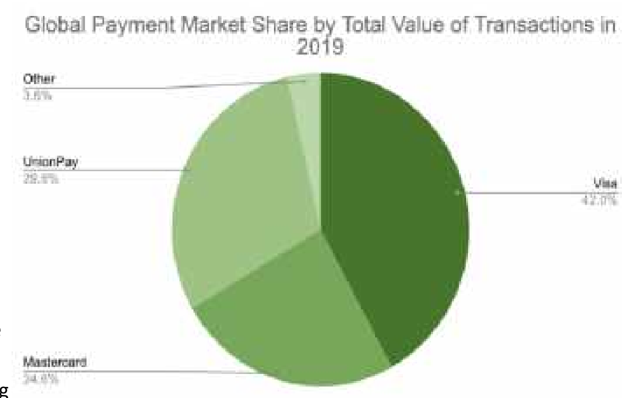
<u>PayPal:</u> PayPal processes easy online transactions, making online stores and businesses have a source of revenue. Often, when looking to buy something online, you could either enter your credit card or your PayPal. There's no doubt that PayPal is extremely innovative, but according to a lot of market researchers, the company is overvalued. Many of the core financial analyses, DCFs, P/S rations, are shaky at best. However, PayPal is still likely to grow due to their own network effects. However, any sort of economic downturn can expect PayPal to fall.

<u>Visa:</u> Visa simply is bigger than Mastercard. Nearly having $7 billion more in revenue, Visa more cash to conduct more business operations. Hence, they were a primary investor in Square and looking to change more towards an online platform. Overall, they have a higher market share of the global payment card system, and just a better system processing unit than them.

At the same time, their competitors, such as PayPal and Square are revolutionizing the method of transactions. PayPal processes easy online transactions, and Square makes transactions easy for small businesses. In addition, Mastercard faces competition from Visa, Fidelity, and other organizations. Still, Mastercard boasts a high stream of revenue, and is currently researching and innovating easier methods of transactions. Simply, Mastercard has a high source of revenue when compared to its peers but must adapt quickly to not fall behind.

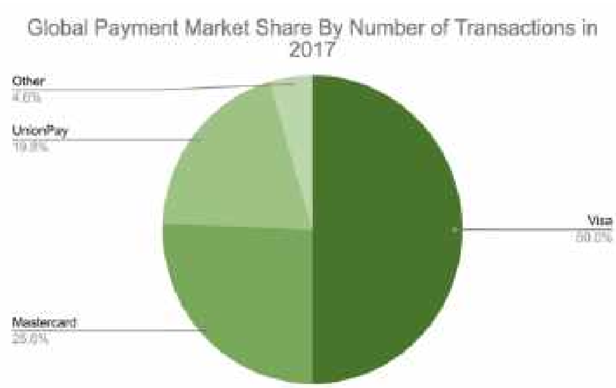
M&A Activity

Recently Masetercard signed an agreement to acquire a minority stake in Airtel Mobile, a subsidiary of Airtel Africa. This investment helps Mastercard extend commercial agreements and forge new partnerships in Africa as Airtel Money, is one of Africa's biggest financial service providers. In addition, Mastercard completed the acquisition of an account-to-account payment business of Nets Denmark, essentially buying and testing their new method of payment.



Industry Background

Mastercard is part of the Payments Processing Industry, which is an ecosystem of different firms that interact with each other to process transactions and exchange payment data. While credit card transactions seem seamless to users, there are many different stages and interactions behind the scenes. The Payment Processing Industry is made up of five sub industries that each complete one step in processing payments: Acquirers, Credit Card Networks, Independent Sales Organizations/Member Service Providers, Issuers, and Gateways. While some companies exist in one of these sub industries, many firms such as Capital One and Bank of America exist in two or more of these sub industries.



To demonstrate the roles of each of these sub industries and how they interact with each other, let's say that I am buying a coffee from Starbucks. Issuing banks, such as Chase, are the banks which consumers have a line of credit and account with that is connected to their credit cards. The money I am using to pay for the coffee is held by the Issuer Bank. Acquiring Banks, such as Bank of America Merchant Services, are like Issuing Banks but are for the merchants and sellers and are also known as merchant banks. Starbucks would have an account with the Acquiring bank where the money I use to purchase the coffee would ultimately end up in. Credit Card Networks, such as Visa and Mastercard, connect issuer banks to acquiring banks. Merchant banks will identify what credit card network the consumer used based on the credit card number and send the payment processing data to the credit card company used. The credit card network will then identify what the issuing bank that the consumer is using and send the payment processing data to the issuing bank. The issuing bank then approves or denies the payment. Independent Sales Organizations (ISOs) and Member Service Providers (MSPs), which includes VersaPay, work with businesses to allow them to accept credit card payments rather than handling it themselves. When transactions are made online, Gateways, which include Stripe, securely transmits payment data to Acquiring Banks and authorizes payments for eCommerce websites.

Industry Trends

A trend in developed countries to move toward cashless payments has accelerated due to the pandemic. In the United Kingdom, 38% of transactions were made with bills and coins from 52.8% in 2013. This has resulted in card payment fees for retailers to increase by $97 million in the UK over two years to $1.80 billion. Many developing countries are also seeing over 10% increases in card usage from 2018 to 2019. However, the pandemic has spurred this preexisting trend, causing a boom in eCommerce and increased use of cards in person due to concerns over the sanitary concerns with paper money. New demographics such as older people have made online shopping part of their lives and use cards to pay for such transactions. In the United States, 36% of consumers shop online weekly compared to 28% before the pandemic. Many Analysts expect most European countries to be cashless by 2030. Most online payments involve credit card networks either directly through credit and debit cards or indirectly such as through Apple Pay's mobile wallet or PayPal. This trend of increased usage of cards is highly likely to continue after the pandemic, which will benefit companies in this industry. According to surveys from the European Central Bank, 41% of respondents reduced their use of cash due to the pandemic, of which the vast majority will continue to pay less with cash after the pandemic is over. The increased use of digital payments which rely on Mastercard's extensive network will help Mastercard in the shift away from cash. Mastercard doubled its fees on card payments in 2019 and is expecting to earn higher revenues as the economy rebounds and consumer spending increases.

Expansion of online retail and decline of in-store retail intensified by the pandemic has caused businesses and consumers to rely more on digital payment methods; cash in transactions will continue to decrease with credit cards filling the void. While credit cards are still predominantly used as a medium of exchange over mobile wallets, mobile wallets such as Apple Pay are seeing a substantial increase in usage, challenging the dominance of Mastercard, Visa, and American Express. Apple Pay currently accounts for 5% of global card transactions and is on track to handle 10% of payments by 2025. However, Apple Pay seems to be targeted at competing with PayPal in the online transaction space. The rise of digital currencies also threatens to destabilize the Payment Processing Industry. Whereas credit cards and payment apps merely move money electronically, China's cyber yuan and cryptocurrencies pose threats of circumventing the Payments Processing Industry.

In the European Central Bank conference in 2020, Fabio Panetta, who is a member of the Executive Board of the ECB, mused about the idea of the issuance of a digital Euro alongside cash. Panetta praised its privacy, low-cost, and low risk compared to private companies in the payment processing industry. While the trend of moving away toward cash will grow Mastercard's revenues, digital currencies pose an existential threat to credit card networks by circumventing them entirely in digital transactions. Many countries' central banks have explored the issue with China's recent creation of the Cyber Yuan and Sweden's first phase of its e-krona pilot project. Innovation in this space funded by governments could significantly disrupt the industry.

Investment Thesis

Expansion Into China

Approximately one year ago, Mastercard entered China's lucrative $27 trillion payments market, after gaining approval from the People's Bank of China to conduct a joint venture with NetsUnion Clearing Corp. (a clearing house for online payments whose stakeholders included the People's Bank of China). Together, this new venture would be called Mastercard NUCC Information Technology and the venture has started preliminary work.

Why is this significant? Cards are an integral portion of the Chinese payment industry, with over eight billion cards in circulation in 2020. This roughly translates to six cards a person in China. However, this market has almost solely been dominated by UnionPay, which contains a 90% market share of the Chinese card industry, according to reports by Nilson and Fox Business. However, the 90% of the market that's currently owned by UnionPay is due to one simple reason - lack of competition. Simply, UnionPay was the only credit card company that was offered en masse to the Chinese public.

This comes after the American and Chinese governments ended the trade war by signing the Phase I agreement. Under this Phase I agreement, China agreed to buy more than $190 billion of US goods and services to help balance the deficit between the two countries. Mastercard and other card companies play a role in this: it's easier for the Chinese consumer to buy American goods using American cards - predominantly for lower transaction fees. In effect, Mastercard stands to benefit from tailwinds, as they should see a significant increase in users in China. In addition, China is more willing to accept business in general, given the pandemic and the overall decrease in business. Critics will say that the Chinese government wasn't able to meet the $200 billion threshold, but that could be blamed due to the pandemic, and they were still only $10 billion short of the mark.

Mastercard entering China is a significant threat to the UnionPay monopoly, as Mastercard has the financial backing to make a strong push into the market. Going further, under this agreement, Mastercard is going to launch the MoneySend service within China. Essentially, the MoneySend service makes it easier to hold a credit card in China, as receivers in China only need to provide an account number, their Bank of China International Card, and the necessary personal information for senders that are outside of China. In addition, consumers can check their transactions by phone, a commonplace practice within the United States, but revolutionary in China.

In response to the new developments in China, Mastercard enhanced their China team with new management appointments. James Chen, Jeroen van Son, and Julie Yang were assigned to handle the following regions respectively: China & Mongolia, Hong Kong & Macau, and the Taiwan market respectively. This reorganization comes with some upside: all three of these leaders were with Mastercard since 2003 and have successfully launched EMV chip card, the Combo Card, the PayPass card and other innovative programs. In short, these leaders have experience to handle the expansion well. Mastercard plans on leveraging their former relationships to establish a strong foothold in China - having connections with the Bank of China since 1987, the Golomt Bank of Mongolia (Mongolia's central bank) since 2008, and an exclusive relationship with the Taiwanese government for launching debt nationally. China plans on first targeting the cities of Hong Kong and Shanghai before expanding into other areas.

There's a historical precedent to this expansion: Singapore. Mastercard was able to break into the Sinagporean card market in 2008 and launched MoneySend there. Mastercard now has a 24% share of the Singaporean card market - which is roughly evaluated at 24.8 billion USD. In effect, we should expect a similar breakthrough with the Chinese market. However, Mastercard isn't the only American card company to be breaking into the Chinese Market. Visa and American Express are two notable American card companies that were also granted permission to conduct business in China. Using the Singaporean example, UnionPay was able to obtain the lionshare of 34% with Visa closely following them with 32%. So how does Mastercard have an edge? Mastercard offers slightly better exchange rates than Visa, making it more appealing to Chinese banks to conduct business with Mastercard. The two companies offer similar benefits to the consumers and are almost always accepted by the same consumer. The market is biased towards Visa, however, on the principle that they are always able to capture a slightly bigger market share than Mastercard. For this reason, Mastercard is often undervalued.

In addition, expanding into China will require Mastercard along with its American counterparts to invest significantly in internal projects such as MoneySend as listed above in order to raise awareness and partner with vendors, for example. Therefore, a prominent indicator in which American payments processing firms will see the greatest profits from these internal projects will be viewing historical ROIC percentages. Mastercard's four greatest American competitors - American Express, Visa, Paypal, and Discover - have ROIC percentages of 20%, 18%, 17%, and 7%, respectively. In comparison, Mastercard has a ROIC percentage of 38%, nearly double of American Express, the leading competitor in this category. Due to this, we expect Mastercard to see a greater profit margin in its expansion into China compared to its competitors.

To conclude, the push in China and the market's undervaluation of Mastercard makes for an appealing buy opportunity.

Expansion in B2B Space Through Investments into Payment Network Rails
Mastercard's new CEO has been accelerating the company's expansion into Real-Time Rails. Payment rails are the digital infrastructure that allow consumers to transfer money across various financial institutions and businesses.

Credit card rails are the predominant rails but suffer from many problems. Because of the various steps in processing payments with credit cards, a payment often takes around 2 to 3 days to process completely and is incredibly inefficient. In the B2B space, 91% merchants in the US reported late payments by their customers. Over a third of businesses require follow-up interaction due in 40% of their invoices with their suppliers to inconsistencies and problems with payment processes. Furthemore, business email compromises because of breaches in the payment processing process have resulted in $1.8 billion of losses to business.

Mastercard has the capacity to gain a competitive advantage over competitors in the payment processing industry by expanding into the multi-rail network. Mastercard Track Business Payment Service, which was launched in May 2020, has expanded to allow businesses to facilitate payments across multiple payment rails including Real Time Payments (RTP) and the Automated Clearing House (ACH). These rails enhance security, as suppliers are not required to share bank account details with buyers and accelerates the time to process payments. This program also allows businesses of all sizes to gain access to new distribution partners such as bzPay, Gardenia Technologies, and Today Payments.

Mastercard estimates the market for B2B payments to be around $25 trillion in the U.S., but analysts expect the B2B payment industry to take several years to develop, as it's still in its early-stages and requires high research and development costs. Additionally, this market is relatively fragmented with mostly startups dominating the space. This might seem attractive to larger payments processing firms such as Mastercard and its competitors, but the high required investment needed for this early-stage technology has deterred Mastercard's competitors to focus on different, more short-term initiatives. For example, Visa is more concentrated in the consumer-to-business payments market rather than the B2B space. This has opened the door for Mastercard to slowly capture this market without having to worry about the tangible and intangible costs that come with fighting for market share with large competitors of similar size. Mastercard has capitalized on this opportunity by beginning to consolidate the market through engaging in an aggressive M&A strategy. In 2019, the firm paid $3.19 billion for Nets A/S, and in 2017, $1.15 billion for VocaLink Holdings, both of which were the leading startups in this space. Due to this, we expect Mastercard to obtain a majority market share in this space in the coming years.

Investment Risks

Expansion Into China: Political Tensions + Domestic Competition
There are multiple risks when considering the expansion into China. The inherent political tension between the United States and China could yield to another tradewar - effectively ending any possible expansion into China. Furthermore, UnionPay's financial statements are relatively unknown, creating more uncertainty. For the political tension, however, both the United States and China have economic incentives to hold the trade agreement. In addition, this is industry wide risk, meaning other companies, such as Visa and American Express, also will endure the same risk. Finally, Mastercard has the competitive advantage over UnionPay for the fact that many Chinese consumers will prefer to use US credit cards to buy US goods.

B2B: Scalability + Timeline

While real time rails are the future of credit cards, one of the biggest risks that comes with innovation in this space is the timeline and scalability. While there are currently more than 50 real-time payment schemes in the world, many of these have been launched in developed countries and there might be a decrease in demand for significant investments in real time payments in developing countries and emerging markets, causing a potential slowdown. Another potential concern is the security risk of real time payments. Because transactions are completed in seconds, banks have little time to monitor for fraud and thus many businesses might be hesitant to switch. Mastercard is heavily investing in its security features for real time payments and acquiring many firms that excel in providing security for automated clearing houses, such as NuData Security. NuData Security was acquired one year following Mastercard's acquisition of Vocalink. Mastercard charges clients for its fraud detection services, which Mastercard also uses to provide more inhouse services and increase the cost of switching to competing payment networks like Visa.

Valuation

DCF Assumptions

Revenue Growth:

As Mastercard's sales are heavily dependent on consumer and business spending, its business model often succeeds in times where the economy is booming. Due to this, the Covid-19 pandemic negatively impacted Mastercard's sales greatly, leading to a 9% decrease in growth in 2020.

- 2021: We expect spending to remain low due to the ongoing effects of the pandemic. However, with vaccination rates increasing, many countries are reopening borders and loosening business and social distancing restrictions, both of which should lead to an increase in spending towards the latter half of the year. Additionally, as Mastercard generates 15% of its revenue from cross border volume fees, the reopening of international borders will once again lead to a growth in this segment. Due to these factors, we estimate revenue growth to increase slightly, albeit slow than historicals, but at a modest 4%
- 2022: Assuming at this point, the pandemic is no longer playing a large role in government policies and consumer behavior due to its decrease in prominence, we expect Mastercard to use its resources at this time to push greatly into the Chinese market. This expansion compounded with the decrease in pandemic effects will lead to Mastercard's revenue growth to align within the historical range, at a value of 10%.
- 2023: From 2020-2022, Mastercard will be investing in developing its real-time payment rail services through acquisitions and internal projects. By 2023, we expect these investments to start materializing from being an early-stage product to being one that can generate revenues for the firm. Due to this, we expect revenue growth to increase slightly from the year before, at a value of 15%.
- 2024: Mastercard will continue to see its investments in its real-time payment rail services generate revenues for the firm. As we expect the service to be in effect for about a year at this point, we don't see revenue growth being as high as it was in 2023, when the firm first launched the service. But the service is still new, hence leading to a revenue growth of 14%.
- 2025: At this point, Mastercard will have already captured most of the growth that comes from entering a new service. Due to this, revenue growth will decrease to 12%, a value that indicates that the company has established services and is starting to mature as well.

EBIT, D&A, CapEx, NWC:

We expect EBIT margins, D&A (as % of revenue), CapEx (as % of revenue), and change in NWC (as % of revenue) to equal 55%, 3%, -2%, and 2%, respectively, the average historical rates. This is due to Mastercard not indicating any significant, drastic changes in each of these categories.

Pro Forma Free Cash Flow Projections

	Historical Period				Projection Period				
Line Item	2017	2018	2019	2020	2021	2022	2023	2024	2025
Revenue	12497.00	14950.00	16883.00	15301.00	15913.04	17504.34	20130.00	22948.19	25701.98
% growth		*20%*	*13%*	*-9%*	*4%*	*10%*	*15%*	*14%*	*12%*
EBIT	6704.00	8332.00	9564.00	7803.00	8752.17	9627.39	11071.50	12621.51	14136.09
% margin	*54%*	*56%*	*57%*	*51%*	*55%*	*55%*	*55%*	*55%*	*55%*
Effective Tax Rate	21%	21%	21%	21%	21%	21%	21%	21%	21%
NOPAT	**5296.16**	**6582.28**	**7555.56**	**6164.37**	**6914.22**	**7605.64**	**8746.48**	**9970.99**	**11167.51**
(+) D&A	436.00	459.00	522.00	580.00	477.39	525.13	402.60	688.45	771.06
% revenue	*3%*	*3%*	*3%*	*4%*	*3%*	*3%*	*2%*	*3%*	*3%*
(-) Capex	-300.00	-330.00	-422.00	-339.00	-318.26	-350.09	-402.60	-458.96	-514.04
% revenue	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*	*-2%*
NWC	-2778.00	-3300.00	-2678.00	-2681.00	318.2608	350.08688	402.59991	458.9639	514.03957
(-) Change in NWC	-	-522.00	622.00	-3.00	318.26	350.09	402.60	458.96	514.04
Change as % of revenue	-	*-3%*	*4%*	*0%*	*2%*	*2%*	*2%*	*2%*	*2%*
Unlevered Free Cash Flow	-	7893.28	7877.56	7086.37	7391.61	8130.77	9149.08	10659.44	11938.57
% growth	-	-	*0%*	*-10%*	*4%*	*10%*	*12.5242%*	*17%*	*12%*
Discounted Cash Flow					6891.41	7067.58	7414.57	8054.01	8410.07

	2017	2018	2019	2020	2021	2022	2023	2024	2025
Revenue	12497.00	14950.00	16883.00	15301.00	15913.04	17504.34	20130.00	22948.19	25701.98
% growth		*20%*	*12.9298%*	*-9.3704%*	4%	10%	15%	14%	12%
EBIT	6704.00	8332.00	9564.00	7803.00	8752.17	9627.39	11071.50	12621.51	14136.09
% margin	*54%*	*56%*	*57%*	*51%*	55%	55%	55%	55%	55%
Effective Tax Rate	21%	21%	21%	21%	21%	21%	21%	21%	21%
NOPAT	**5296.16**	**6582.28**	**7555.56**	**6164.37**	**6914.22**	**7605.64**	**8746.48**	**9970.99**	**11167.51**
(+) D&A	436.00	459.00	522.00	580.00	477.39	525.13	402.60	688.45	771.06
% revenue	*3%*	*3%*	*3%*	*4%*	3%	3%	2%	3%	3%
(-) Capex	-300.00	-330.00	-422.00	-339.00	-318.26	-350.09	-402.60	-458.96	-514.04
% revenue	*-2%*	*-2%*	*-2%*	*-2%*	-2%	-2%	-2%	-2%	-2%
NWC	-2778.00	-3300.00	-2678.00	-2681.00	318.2608	350.08688	402.599912	458.9638997	514.0395676
(-) Change in NWC	-	-522.00	622.00	-3.00	318.26	350.09	402.60	458.96	514.04
Change as % of revenue	-	*-3%*	*4%*	*0%*	2%	2%	2%	2%	2%
Unlevered Free Cash Flow	-	7893.28	7877.56	7086.37	7391.61	8130.77	9149.08	10659.44	11938.57
% growth	-	-	*0%*	*-10%*	*4%*	*10%*	*12.5242%*	*17%*	*12%*
Discounted Cash Flow					**7391.61**	**8130.77**	**9149.08**	**10659.44**	**11938.57**

Weighted Average Cost of Capital	
Current Share Price	$ 375.40
Shares Outstanding	993.00
Market Capitalization	372772.2
Total Debt	13523.00
Cash & Cash Equivalents	10113.00
Net Debt	3410.00
Percent Equity	96%
Percent Debt	4%
Risk Free Rate	2%
Beta	1.01
Equity Risk Premium	6%
Cost of Equity	7%
Cost of Debt	3%
Tax Rate	21%
WACC	7%

Perpetuity Growth Rate		**Exit Multiples Method**	
Terminal Growth Rate	2%	Exit Multiple (EV/EBITDA)	35x
Terminal Value	231587.3041	Terminal Value (EV/EBITDA)	521750.1612
Discounted Terminal Value	163140.6089	Discounted Terminal Value	367544.4962
Sum of Discounted Cash Flows	37837.64	Sum of Discounted Cash Flows	37837.64
Implied Enterprise Value	200978.25	Implied Enterprise Value	405382.14
Implied Equity Value	197568.25	Implied Equity Value	401972.14
Fair Value per Share	$198.96	**Fair Value per Share**	$404.81
Implied Premium (%)	-47.00%	**Implied Premium (%)**	7.83%

Sensitivity Analysis

WACC vs. Perpetuity Growth Rate

-47.00%	5.76%	6.26%	6.76%	7.26%	7.50%	8.00%	8.50%
1.6%	-31.16%	-8.32%	9.55%	9.55%	-52.42%	-56.38%	-59.76%
1.8%	-45.99%	-32.38%	-22.81%	-22.81%	-50.99%	-55.19%	-58.76%
2.0%	-44.11%	-29.36%	-18.81%	-18.81%	-49.46%	-53.92%	-57.70%
2.2%	-42.07%	-26.02%	-14.34%	-14.34%	-47.82%	-52.57%	-56.57%
2.4%	-39.86%	-22.31%	-9.28%	-9.28%	-46.04%	-51.12%	-55.37%

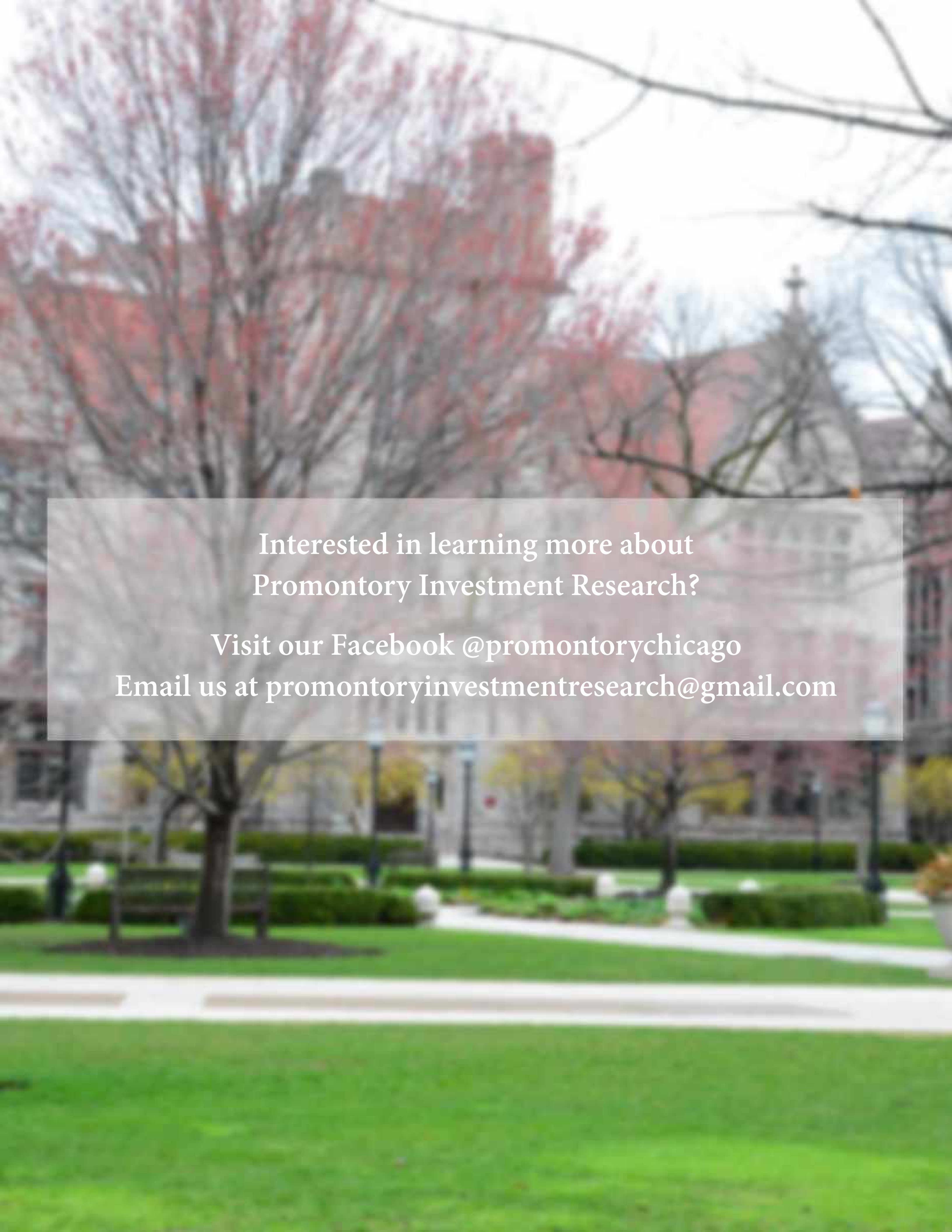
WACC vs. Exit Multiples

7.833%	***5.5%***	***6.0%***	***6.5%***	***7.3%***	***7.5%***	***8.0%***	***8.5%***
30x	-6.25%	-6.25%	-6.25%	-6.25%	-6.25%	-6.25%	-6.25%
33x	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%	2.20%
35x	7.83%	7.83%	7.83%	7.83%	7.83%	7.83%	7.83%
37x	13.47%	13.47%	13.47%	13.47%	13.47%	13.47%	13.47%
40x	21.92%	21.92%	21.92%	21.92%	21.92%	21.92%	21.92%

Comparable Company Analysis

	EV/Revenue	EV/EBITDA	EV/EBIT	P/E
Mastercard	**24.5**	**43.2**	**46.4**	**57.6**
Visa Inc.	23.5	34.8	36.8	48.0
Discover	15.0	4.9	3.0	33.6
PayPal Holdings Inc.	12.9	59.5	72.2	57.7
Global Payments Inc.	9.1	23.3	53.5	94.6
Fidelity Inc.	8.9	26.6	73.0	Negative EPS
Fiserv Inc.	6.7	19.9	52.2	92.2

Mastercard	**24.5**	**43.2**	**46.4**	**57.6**
First Quartile	9.0	21.6	41.6	50.4
Median	12.9	26.6	52.2	57.7
Mean	14.4	30.3	48.2	64.0
Third Quartile	19.2	39.0	62.9	83.6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