The Henry Fund
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Moody's Corp. (MCO)

October 21, 2020

Financial Services – Credit Rating Agencies

Stock Rating **BUY**

Investment Thesis

We recommend a buy rating for Moody's Corp. with 12% potential upside. With interest rate remaining around historical low, increasing number of debt issuance has led to strong demand in the credit rating service. As a result, MCO has been and is expected to continue outperforming its peers in the sector and broader market with its market shares and strong pricing power. However, we are closely monitoring the potential risk factors that could impact the firm values, including rise in interest rate, further regulation on rating agencies, and emerging technological rating system.

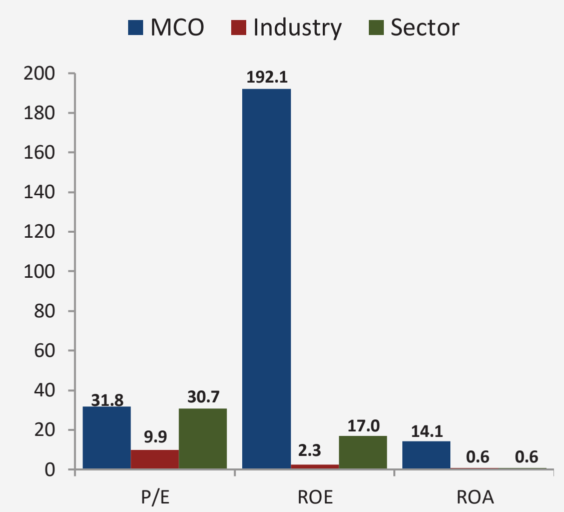
Drivers of Thesis

- **Continuing Fragmentation in Credit Markets Leads to Higher Demand in Rating Service:** The low interest rate environment has led to higher volume in debt issuance. Our view is that the interest rate will continue to remain in the current territory. As a result, there will be higher demand in credit rating services accordingly. We are forecasting a higher-than-historical average annual growth rate of 7.5% in Moddy's investor services (MIS) sector in our model [3].
- **Strong Performance on Absolute and Relative Basis:** MCO has outperformed the industry by 83x and the sector by 11x in ROE ratio [2].
- **Large Market Share and Strong Pricing Power:** MCO has established a strong position and long tracking record in the rating industry. In addition, from firm's perspective, cost of switching rating agency could be high, which allows Moody's to raise prices further as a result [4].

Risks to Thesis

- **Rising Interest Rate:** Rising interest rate and changes in capital markets conditions could lead to lower volume in the debt issuance, which could impact Moody's revenue stream in the Moody's Investor Services (MIS) segment. However, with 39% revenue exposure to Moody's Analytics (MA), MCO will continue to have subscription-based revenue when interest rate rises.
- **Increasing Regulatory Oversight on Rating Agencies**: Across global markets, regulators could introduce closer scrutiny on the rating agencies' issuer-pay model [4]. We priced this into our model with higher historical average operating expense of 28% (2% higher than historical average), as a result from more regulation [3].
- **Emerging New Technological Rating System:** With new technology emerging, there could be more reliance on machine to conduct analysis and assign ratings. However, our view is that there are still many areas, such as qualitative analysis, that would have to rely on human's interpretation and rating agency.

Target Price	$305-315
Henry Fund DCF	$302
Henry Fund DDM	$315
Relative Multiple	$305
Price Data	
Current Price	$285.4
52wk Range	$164.19 – $305.95
Consensus 1yr Target	$313.42
Key Statistics	
Market Cap (M)	55,321
Shares Outstanding (M)	190.7
Institutional Ownership	92.3%
Five Year Beta	1.23
Dividend Yield	0.8%
Est. 5yr Growth (EPS)	10%
Price/Earnings (TTM)	32.0x
Price/Earnings (FY1)	31.8x
Price/Sales (TTM)	10.7x
Price/Book (mrq)	52.7x
Profitability	
Operating Margin	45.4%
Profit Margin	33.4%
Return on Assets (TTM)	14.1%
Return on Equity (TTM)	192.1%

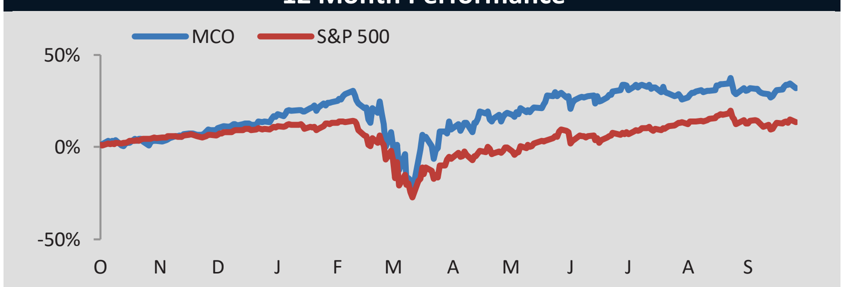


Source: Yahoo! Finance, FactSet

Earnings Estimates

Year	2017	2018	2019	2020E	2021E	2022E
EPS	$5.24	$6.84	$7.51	$8.79	$9.89	$11.16
Consensus				$9.42	$9.91	$11.02
Growth		*+30.5%*	*+9.8%*	*+17.0%*	*+12.5%*	*+12.8%*

12 Month Performance



Source: Yahoo! Finance

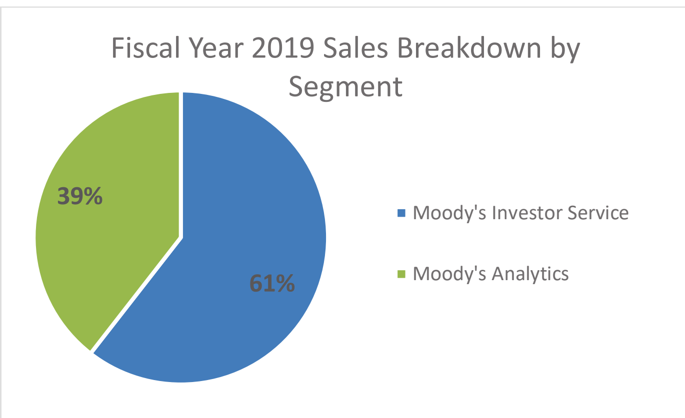
Company Description

The Company is headquartered in New York City and engages in the provision of credit rating, research, tools and analysis to the global capital markets. MCO is one of the Big Three credit rating agencies in the U.S. The company is also a large-cap financial services company. Moody's provides credit rating on 11,000 corporate issuers and 18,000 public finance issuers in 120 countries. It operates across two segments: Moody's Investor Service (MIS), and Moody's Analytics (MA).

COMPANY DESCRIPTION

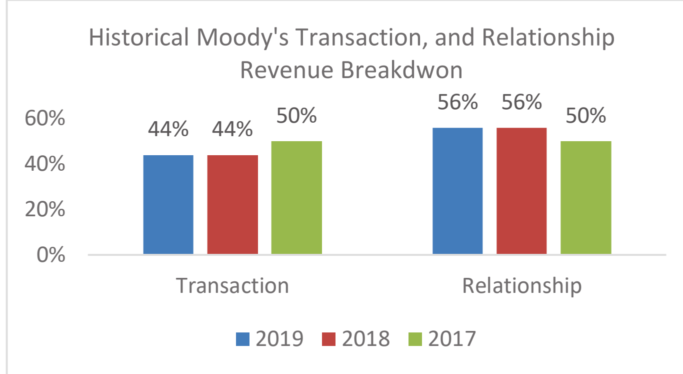
Moody's is a provider of credit rating and assessment services: credit, capital markets and economic research, data and analytical tools, software solutions that support financial risk management activities, quantitatively derived credit scores, learning solutions and certification services, offshore financial research and analytical services. The company is one of the largest U.S. credit rating agencies, with nearly 11,000 employees across 130 countries. In 2019, firm posted $4.8Bn in the total revenue, with 52.7% generated by domestic business [6].

The company operates in two major business segments which are Moody's Investor Service (MIS), and Moody's Analytics (MA). MIS generates revenue by providing rating services, while MA generates revenue by providing financial intelligence and analytical tools to assist businesses making decisions [6]. In these revenue segments, S&P Global (Ticker: SPGI) is the main competitor to Moody's in both revenue segment. In the meanwhile, we also see smaller competitors like IHS Markit (Ticker: INFO), and Morningstar (Ticker: MORN) join the industry competition. Overall, we believe MIS revenue segment is directly benefited from the low interest rate environment, and while MA revenue segment will be benefited from the high interest rate environment. Since 2011, the company has maintained the similar revenue breakdown as the following:



Source: MCO FY 2019 10K

MCO main revenue sources are categorized into two components. Transaction revenues are referred to the first-time issuers rating fee, while the relationship revenues are subscription based allowing recurring issuers to reissue their debt and have MCO provides rating service. The following chart shows the overall breakdown of transaction, and relationship revenue for MCO:



Source: MCO FY 2019 10K

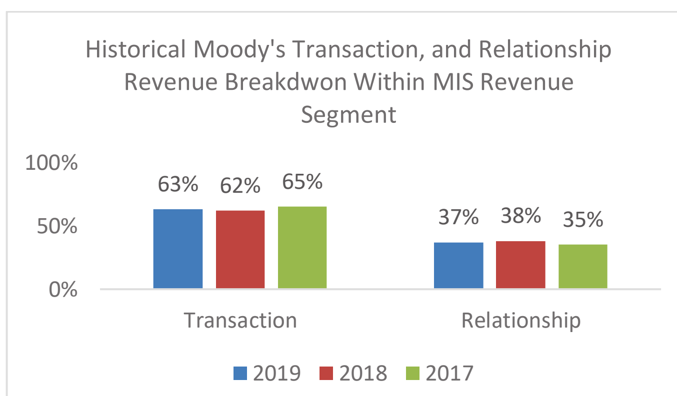
Throughout trailing three years, MCO has been growing its subscription-based (relationship) revenue which provides a stable cash inflow and cushion when interest rate is not as attractive as it is currently to the debt issuers.

The following sections detail further information about each revenue segment and its profitability for MCO:

Moody's Investor Service

Sixty one percent of Moody's revenue is generated by the Investor Service. This revenue segment offers ratings and assessment services across a wide range of debt obligations around the world. MCO's revenues are generated through the originators and issuers of transactions who subscribed to Moody's Investor Service to support the distribution of their debt issues to investors. From pricing's perspective, Moody's investor service charge in two ways. For debt issuance, Moody's charge a one-time transaction fee, and going forward company can choose to enroll in their subscription-based service where Moody's conducts ongoing monitoring annually for the corporate debt, and semi-annually for the sovereign debt.

The following chart shows Moody's revenue breakdown on new deal transaction revenue and recurring contract subscription-based (relationship) revenue:



Source: MCO FY 2019 10K

In MIS revenue segment, around 63% of its revenue comes from transactional business, while 37% comes from relationship-based revenue during fiscal year of 2019. Therefore, the surge in debt issuance this year has benefited MIS revenue segment. Even though it may seem like Moody's relies more on transactional revenue, overall the company still has 56% over its revenue coming from relationship-based revenue. And this, with the subscription model, could provide a buffer for the company if the interest rate rises.

In addition, Moody's rating services cover more than 130 countries. These coverages are published via press releases to the public through a variety of print and electronic media, which includes the internet and real-time information systems that are used by securities traders and investors [6].

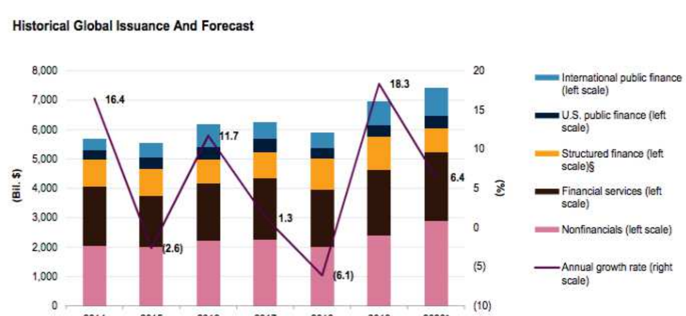
In this revenue segment, Moody's also includes revenue generated by non-rating related operations. This is primarily consisting of financial instruments pricing services in the Asia-Pacific region as well as ICRA non-rating operations, which are assembled to support the financial analysis and risk management activities of institutional customers worldwide.

The following table shows MCO's rating relationship with different type of issuers:

Type of Issuers	Number of Issuers	% of Total Issuers Covered by Moody's
Public finance issuers (sovereign, sub-sovereign, and supranational issuers)	17,200	47%
Structured Finance Transactions	9,500	26%
Non-Financial Corporate Issuers	4,900	14%
Financial Institutions Issuers	4,100	11%
Infrastructure and Project Finance Issuers	1,000	3%

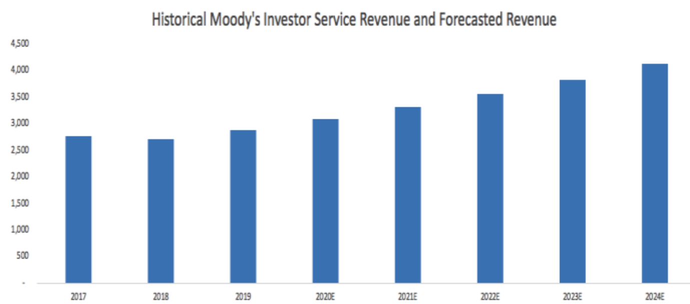
Source: MCO FY 2019 10K

We expect this revenue segment to continue to outperform over the next three years as the Fed has announced to maintain interest rate close to zero. With the interest rate remaining low, more companies could recognize this advantage of borrowing at a lower cost, and issuing more debts. As a result, companies will need to subscribe to the credit rating and assessment services with a rating agency. Moody's, as one of the three largest rating agencies, will no doubt benefit from this trend.



Source: S&P Global Ratings

From the chart above, in the broader market, we have observed an upward trend in the number of issuance across non-financials, financial services, U.S. public finance, and international public finance. Within MCO, the top three issuers are international public finance, U.S. public finance, and structured finance. Given that Moody's evaluating company's or sovereign's rating based on the expected loss, which reflects both on the likelihood of default and expected financial losses in the event of default, we see more investors choosing Moody's over SP Global [23] who evaluated the credit rating based on probability of default. Therefore, we expect an annual average growth rate of 6%, which is higher than its historical growth rate of 4% due to higher debt issuances in the low interest rate environment and Moody's rising price power[3].



Source: MCO HF Model

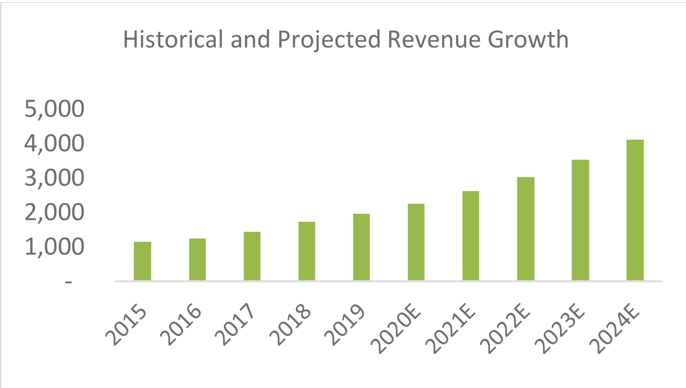
Moody's Analytics

The Moody's Analytics revenue segment takes up 39% of MCO's total revenue. This revenue segment provides financial intelligence and analytical tools to assist businesses in making decisions. These services include specialized research, data, software, and professional services, which aim to support the financial analysis and risk management activities for institutional customers around the world. The Company's customers from this revenue segment represents more than 11,000 institutions across over 155 countries as of fiscal year 2019. In fact, over 306,000 individuals have accessed MCO's research website as of fiscal year 2019 [6].

With recent market events, such as Coronavirus outbreak and political risk between U.S. and China, we expect growing customer demands in the service going forward as the market volatility continues to grow. In fact, we project a 20% rate which is higher than the historical average growth rate of 15% in research, data & analytics revenue stream as more financial professionals and investors embracing market volatility and looking for reports/tools to analyze investment risk. In addition, with the new norm of working from home, there is increasing reliance on the technology applications/systems that could be accessed anywhere, such as Moody's analytics. Similarly, as the market continues to be volatile and vulnerable to event and political risks, we also expect higher growth rate of 9% in enterprise risk solutions and average annual growth rate of 2%

for professional services, which is higher than historical average growth rate of 1% [3].

The chart below shows historical and projected revenue growth for Moody's Analytics:

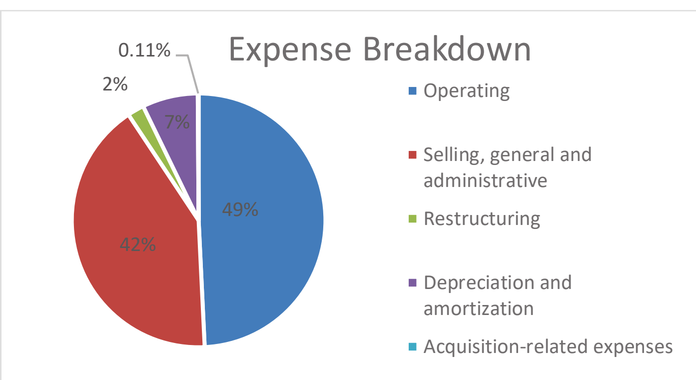


Source: Henry Fund Model

Cost Structure

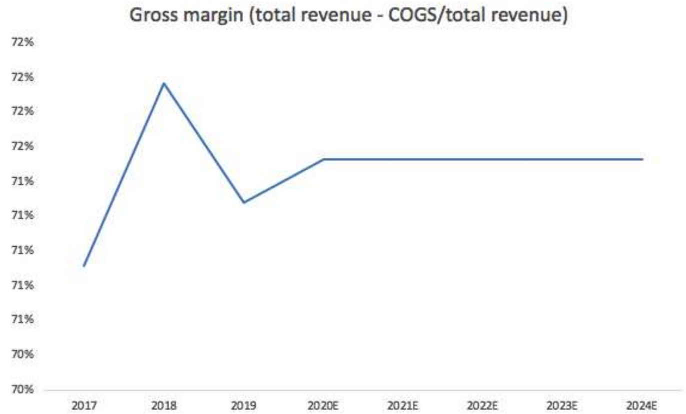
MCO incurs costs in relation to the operation of its services, selling, general and administrative, restructuring, depreciation and amortization, and acquisition-related expenses [6]. MCO's compensation expense has increased by $141mm since 2018 as a result of restructuring actions, including paying employee benefit cost, contract termination cost and asset impairments. In addition, over the past few years, MCO has been acquiring business related to rating agency in order to compete in this industry. We expect this action to continue to grow with ongoing market uncertainty and low interest rate environment. Thus, this expense segment will continue to grow at 11%, which is align with the historical growth rate [3].

The following chart shows MCO's cost breakdown:



Source: MCO FY2019 10K

Being one of the top three rating agencies in the industry, we also expects Moody's to exhibit an even stronger pricing power going forward given that the cost of corporation switching to another rating agency is costly. Below is a line graph of our model margin projection:



Source: HF Model

We expect the margin growth to increase by 2% higher than the historical average growth rate, based on the stronger pricing power and larger shares in this industry going forward.

ESG

MCO follows ESG factors throughout its operations and two business segments. According to FactSet, MCO ranked a score of 12.2 which is in the third percentile compared to other companies in the market, and at 76th percentile for the governance score. Moody's sustainability related achievements have included the following: reporting using recommendations from Sustainability Accounting Standards Board, becoming a signatory to the principles for Responsible Investment, joining the United Nation Global Compact, and issuing annual reports on how the Company has implemented the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) [6]. In addition, MCO has ESG Solutions Group that centralized resources and intelligence across the company to help market participants advance strategic resilience, responsible capitalism, and the greening of the economy [21].

RECENT DEVELOPMENTS & INDUSTRY TRENDS

MCO Second Quarter Earnings

The table below shows MCO's analyst's consensus and actual EPS and Revenue that were announced on 7/14/2020:

	Street Consensus	Actual	Miss/ Beat?
EPS	$2.21	$2.81	Beat
Revenue	$1.24 billion	$1.40 billion	Beat

Source: CNBC

In Moody's 2Q 2020 report, MCO reported a better than expected financial results.

- EPS: $2.81 per share, +36% YoY

- Revenue: $1.24 billion, +18% YoY driven by MIS 27% growth YoY and 5% growth from MA YoY
- MIS revenue growth 27% YoY:
  - **Corporate finance revenue** +47% YoY driven by record investment grade supply in the quarter as spreads tightened and issuers looked to ensure sufficient liquidity amid the economic uncertainty
  - **Financial institutions revenue** +14% YoY driven by U.S. insurance companies and banks seeking opportunistic funding
  - **Public, project and infrastructure finance** +23% YoY driven by low rates environment where investment grade infrastructure issuers sought liquidity
  - **Structured finance revenue** -28% YoY driven by a decline in CLO activity across U.S. and EMEA, and CMBS within U.S.
- MA revenue growth 5% YoY:
  - **Research, Data and Analytics** +16% YoY driven by revenue from reclassification of Moody's Analytics Learning Solutions, and the acquisitions of Regulatory DataCorp and ABS suite
  - **Enterprise Risk Solutions** +12% YoY driven by strong demand for IFRS17 products (newest IFRS standard for issuance contracts and replaces IFRS 4 on 1/1/2022) along with subscription sales of credit assessment and loan origination solutions
- FY 2020 EPS's guidance is within the range of $8.80 - $9.20, versus the consensus at $8.66

The Management team's guidance on revenue segments in 2020 includes MIS revenue segment double-digit growth rate in 2020, which aligns with our Henry Fund model of 12% annual average growth rate in MIS. The Management team also projects a mid-single digit growth rate in MA revenue segment in 2020 due to recurring revenue mitigates the COVID-19 impact, which again aligns with our model that forecast a 9% annual average growth rate in MA revenue segment.

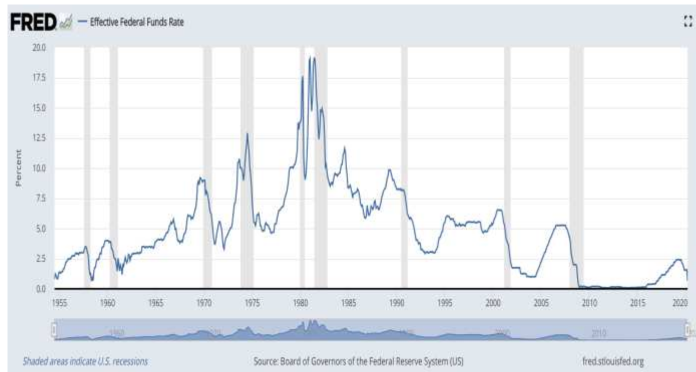
Management indicated that there was no shares repurchased during 2Q 2020, while cumulative share repurchased since 1Q 2020 is around 1.1mm shares ($253mm). In addition, management has taken precautionary measure to preserve cash even though it was not needed and has announced a suspension of repurchases at least through the end of 3Q 2020, which was also modeled into our model.

Overall, MCO has benefited from the low interest rate environment where debt issuances surged during 2Q 2020. The Management team expects the momentum to continue until the end of 2020, thus giving an overall growth in revenue and EPS guidance for fiscal year 2020 [10].

Low Interest Rates

As a mechanism to stimulate the impacted and slowing economy caused by recent COVID-19 pandemic, the Fed has determined to drop the rate close to 0%. This has significantly helped Moody's revenue growth as more companies are now seeking debt issuance and taking advantages of the low borrowing costs. In addition, Fed's chairman Jerome Powell indicated that this low interest rate environment will continue to be effective until at least the year of 2023 [22].

Historical Fed Fund Rate

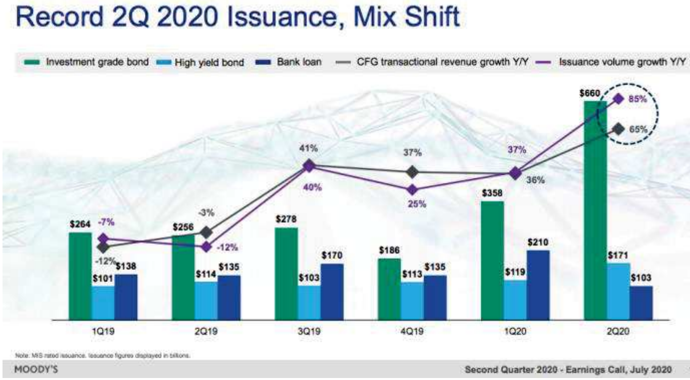


Source: FRED

Historical Corporate Yield Curve

Source: FRED

Since the coronavirus outbreak started in March 2020, the Fed has kept the interest rate near-zero. As a result, volume in loan issuance have been increasing. The graph above shows a significant corporate yield drop sine 2019. In addition, the graph below shows Moody's historical issuances volume and respective product types:



Source: Moody's 2Q 2020 Presentation Slides

Therefore, we expect the company to continue to grow at its historical average growth rate for the next five years [3].

COVID-19 Impact

According to FactSet, the impact score indicates that Moody's Corporation is less impacted by the COVID-19.

Moody's Downgraded Various Companies: Fifty three percent of Moody's revenue comes from rating services. During the pandemic, many companies had struggles in maintaining liquidity and preserving cash. Therefore, as a rating agency, Moody's has been downgrading more companies than upgrading them during the pandemic. According to Arkansas Online, Moody's has downgraded more than 180 companies, including about 20 investment grade firms and 160 junk-rated borrowers just as of March 27, 2020 [11]. The majority of the downgrades fell in the transportation (consumer), hotel, gaming & leisure, and automotive sectors.

Source: Moody's 2Q 2020 Results

However, since the company charges an upfront transaction fee when they provide rating for debt issuance and issuers companies. Therefore, MCO does not face risk in uncollected transaction fees on these newly added debt issuers.

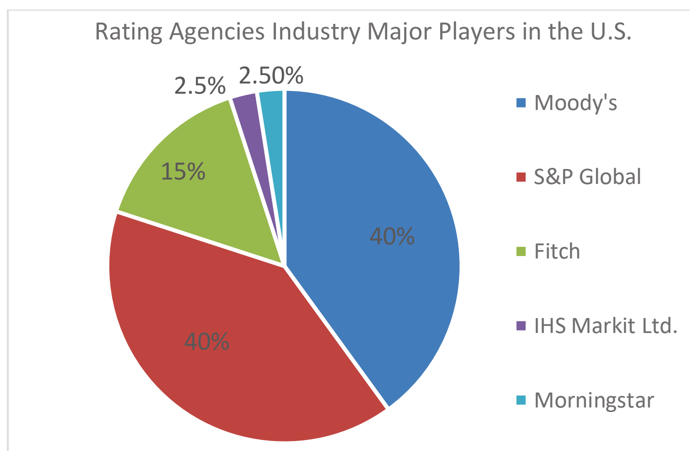
Higher Demand in Credit Research Report under Volatile Market Environment: On the other hand, current market posting higher demand for the customers to access professional rating in credit market and economic research. According to Moody's 2Q 2020 report, under COVID-19 disruption, Moody's has maintained its retention rate of 94%, showing the elevated usage of credit and economic research [10].

Overall, we believe the impact of coronavirus outbreak impact on MCO's remains neutral. In fact, it has added values to the firm with the increasing demand in research report that evaluates the quality of debts and macroeconomic movement.

MARKETS AND COMPETITION

Rating agency industry is a reputation-based market with high barriers to entry. As a result, the main competition in the industry has largely surrounded the battle over market shares between Moody's and Standard & Poor's [15]. However, the regulators are trying to create diversification in the marketplace by imposing more regulatory requirements in this industry. As a result, we expect more players to enter into this industry over the next five years. According to IBIS world, the number of industry operators is estimated to rise at an annualized rate of 1.9% in 2025 [15].

The chart below shows the major players in this industry and their respective market shares. Moody's and S&P Global have the highest market shares while Fitch, a private company, has around 15% of total market share. These three companies are the "Big Three" rating agencies in the market, while IHS Markit Ltd. and Morningstar focus more on investment services.



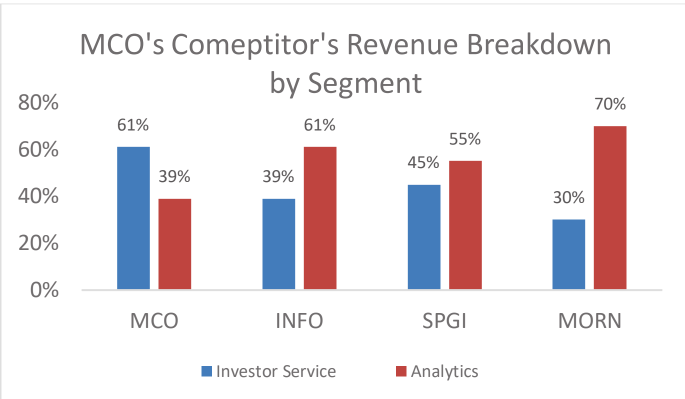
Source: FactSet, data as of FY 2019

Future Growth Prospects: Overall, we expect higher loan issuances due to low interest rate environment and slow economy recovery. Therefore, we forecast an average annualized growth rate of 3.5% in CV EPS in our model which is aligned with IBIS forecasted industry growth rate over the next five years [15].

Peer Comparisons

In the following paragraphs, we conduct a competitive analysis between Moody's, S&P global, IHS Markit, and Morningstar. Note that Fitch Ratings Inc. is not a public company, hence it is not considered to be in-scope for review.

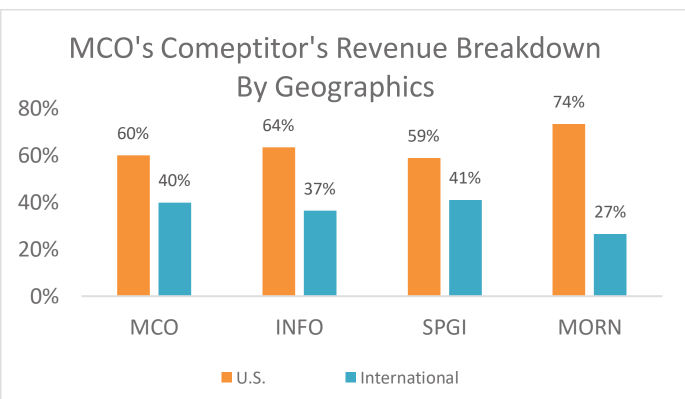
The chart below details firm's revenue breakdown by segments, across MCO's competitors:



Source: FactSet

Unlike its peers, Moody's core revenue stream is rating service while its competitors mainly generated revenue via offering analytics. In particular, Morningstar generated approximately 70% of the revenue through its analytics and 30% in rating service.

The chart below details firm's revenue breakdown by regions, across MCO's competitors:



Source: Bloomberg

Compared with its peers, Moody's along with S&P have the most balanced exposure to both domestic and international markets, which could reduce the impacts if interest rate increase in the US going forward.

Relative Metrics: From the table below, we see Moody's and S&P Global being the leading companies in this industry. Moody's has the highest EV/EBITDA, and holds the second position in dividend yield, ROE, EPS, and P/E ratio.

Ticker	MCO	SPGI	INFO	MORN
EV/EBITDA	**23.4x**	23.2x	**23.4x**	24.0x
Dividend Yield	0.8%	0.8%	**0.9%**	0.7%
ROE	265.3%	**346.8%**	6.1%	15.1%
Operating Margin (ttm)	45.4%	**52.34%**	19.3%	15.0%

Source: FactSet, data as of FY 2019

- **Price/Book Ratio**: MCO has the largest EV/EBITDA because of its position as one the largest rating agency in the industry. It has the second largest enterprise value compared to the group while S&P Global has the largest enterprise value. However, looking at EBITDA size, Moody's EBITDA is 1,000 less than S&P Global's, thus having a slightly higher EV/EBITDA metric.

- **Dividend Yield**: INFO has the highest dividend yield but only 0.1% higher than both MCO and SPGI. However, we believe that, as one of the largest rating agencies, more debt issuers and customers will tend to rely more on the well-established rating services over the next few years as we slowly recover from COVID-19 outbreak. So, we expect to see a more stable growth in dividend yield for both Moody's and S&P Global in the industry.

- **ROE and Operating Margin**: Both MCO and SPGI outperformed in return on equity, and operating margin when compared to their peers. MCO has the second largest ROE and operating margin, while SPGI has the largest. SPGI has relatively higher ROE, and operating margin than MCO because it has the largest stake in the industry so have higher revenue compared to Moody's.

Target Market: MCO has similar target customers as its competitors. Its target market includes credit rating on businesses, governments, securities and financial markets.

Industry Life Cycles: This industry is in mature stage, according to IBIS World [15]. In addition, it is expected to increase at an annualized rate of 3.5%, which is also the assumption captured in our financial model. As a result, this industry is expected to outpace US GDP over the next 5 years driven by the introduction of new products and services. However, this industry could also be facing heavier regulation in order to maintain credibility in this industry and advanced technology that could automate part of what Moody's has been doing with its rating services.

The industry has also been benefited from the rapid introduction of products and services associated with the significant increases in collateralized debt obligations (CDO), and complexed structured financial products [15]. As one of the largest rating agencies in this industry, we expect MCO to benefit accordingly.

Housing Crisis Led to Questionable Reputation: In 2008, the housing crisis was largely involved in rating agency's untransparent rating system. After a decade of recovery from the last housing crisis, some people are still worried about the reputation of theses rating agencies. However, after the crisis, the government has introduced new regulation (i.e. Dodd-Frank Wall Street Reform and Consumer Protection Act) that includes continuing on-site oversight of the rating agencies, and additional disclosure requirement for ratings of asset-based securities [13]. For example, different from last housing crisis, Moody's now factors "systemic support" into its ratings. This factor aims to evaluate the chances that a bank might get bailed out going forward.

Regulation has also increased fixed costs to the company. While this raised the barriers for smaller rating agencies to enter the market, larger rating agencies have been able to manage the cost accordingly. In addition, even with new companies entering the market, the cost for customers to switch rating agencies are exceedingly high [4]. For this reason, though we are in a recession that is caused by COVID-19 and higher wave of company bankruptcies that may lead to more regulation introduced to the industry, Moody's will not be impacted as hard as the smaller agencies in the industry.

Overall, on the relative metrics, we see MCO and SPGI both standout in the industry. However, when comparing the two firms further, we found MCO has relatively lower debts in its balance sheet when comparing with SPGI.

However, based on the liquidity metric, the current ratio indicates that MCO is more capable of paying its short-term obligations. Thus, even though SPGI posted higher values in some metrics than MCO, we believe that MCO exhibits stronger financial health and forward-looking growth.

Ticker	MCO	SPGI
Current Ratio	1.9	1.5

Source: FactSet, data as of FY 2019

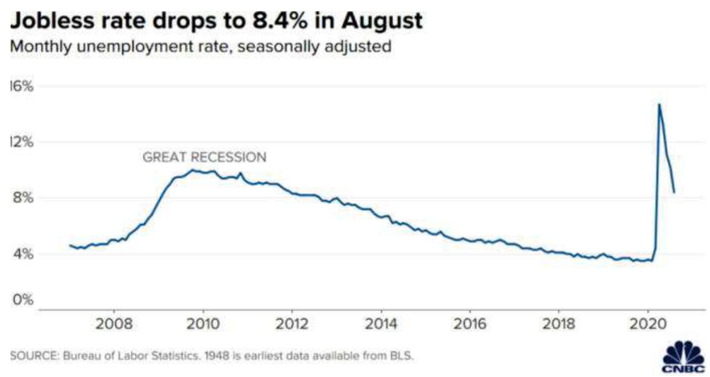
ECONOMIC OUTLOOK

Moody's business comprises of mostly credit market and economic research reports. Therefore, during this unprecedented time, it will be crucial to monitor unemployment rate, the Federal Reserve Policy, and further regulation in the rating agencies industry.

Unemployment Rate

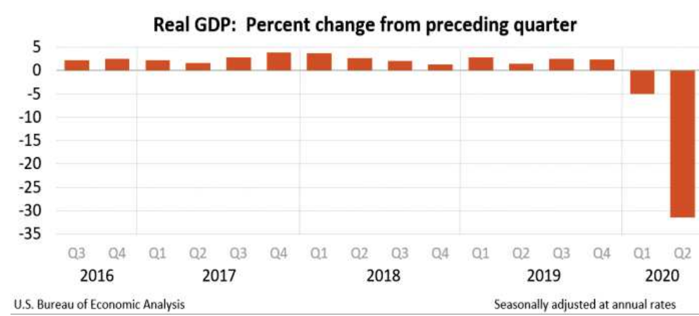
The official unemployment rate fell to 8.4% in August as businesses continue its gradual recovery out of the broad shutdowns that were imposed following the COVID-19 pandemic. Starting from April 2020, economy hit the peak of unemployment rate of 14.7% [20]. The unemployment rate has remaining high but trending downwards. Even though the unemployment number is lower than the level in April 2020, the overall unemployment rate is still relatively high compared to what we have seen during the Great Depression.

The chart below shows current unemployment rate compared to the unemployment rate during the Great Depression era.



Source: CNBC

The GDP growth decreased at an annual rate of 31.4% in the second quarter of 2020, and the prior quarter was negative five percent growth.



Source: U.S. Bureau of Economic Analysis

Therefore, we believe that we are now in a recession. If the unemployment rate remained elevated, we expect to see more firms being downgraded and increasing demand in economic research from investors in order to manage the portfolio risk under volatile market condition. Thus we expect the positive growth momentum to continue for Moody's.

The Federal Reserve Policy

Historical Fed Fund Rate

Source: FRED

On August 28, 2020, the Federal Reserve announced it would now target inflation rate to be averaging 2% over time, instead of its usual target at 2% rate. The Fed Chair Jerome Powell also indicated that the Fed will allow inflation run "moderately above 2% for some time" [21]. This approach will likely keep interest rates at bottom for years. Furthermore, on September 16, 2020, the Federal Reserve concluded that it will keep short-term interest rates anchored near zero (0% - 0.25%) through 2023 [22]. These decisions made by the Fed have stimulated more debt issuances. As a result, Moody's has benefited from these actions as debt issuances usually need a rating agency's review in order to be part of the benchmark index.

In addition, the Fed has also begun buying corporate bonds, municipal bonds, and asset-backed securities. This action has also given the market more faith in purchasing investment grade bonds. Therefore, since the pandemic started, the issuance of investment grade bonds have actually reached a record high.

The following chart shows the historical supply volumes for investment grade bond that was published on 4/13/2020:

Historical U.S. Investment Grade Bond Issuance

Source: BofA Global Research

On the other hand, according to the quarterly report, Moody's has posted an 85% increase in producing the reports of investment grade corporate bonds [10]. Even though the Fed has indicated to main the interest rate at/near zero level, it is still critical to follow the Fed's policy and monitor their efforts in continuing buying back corporate debt and other fixed income products so that the debt issuances momentum can continue going forward.

Regulation

Since 2006, the rating agency industry has been heavily regulated as the government aiming to keep the industry credible and safe for the investors. In 2006, Congress passed the Credit Rating Agency Reform Act of 2006 which allows the SEC to regulate internal processes, record-keeping, and certain business practices of CRAs. Though the regulations were established, it did not solidly cover the product in structured finance.

Therefore, during the last housing crisis of 2008, rating agencies were found giving misguided rating to collateralized debt obligations (CDOs) and the subprime loans. Subsequently, the government introduced the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2020, which added further scrutiny on the rating agencies such as requirement to disclose rating methodologies [14]. As we see the volume of debt issuances trending upwards, we expect more regulations will be introduced in order to ensure the investors are getting reputable and credible rating reports.

On the other hand, we believe that more regulations will be added in the industry and will as a result associate with higher fixed cost for the rating agencies. As one of the largest rating agencies in the industry, increasing fixed cost would actually benefit Moody's position in the industry as it would add more burden to smaller rating agencies.

VALUATION

According to DCF and DDM models, it is estimated that the stock price target for Moody's Co. is between $305 -315.

According to Relative Valuation analysis, comparing with MCO's key competitors including IHS Markit (Ticker: INFO), S&P Global (Ticker: SPGI),and Morningstar (Ticker: MORN), the conclusion is aligned with the DCF and DDM models.

Within the industry, the average company's P/E multiple for 2020 is 34.66x, and 33.03x for 2021. MCO is currently trading at 33.5x P/E of 2020, and 29.8x P/E of 2021 and undervalued than its peers [3]. Therefore, the model results estimate approximately 12% potential upside. This is led by the strong long-term revenue growth, steady dividend yield, and outperformance relative to its peers. However, we are closely monitoring the potential risk introduced by unemployment risk and GDP growth, the Federal Reserve Policy, and further regulation introduction to this industry.

Therefore, we recommend a BUY rating for Moody's Co.

Assumptions

When building the DCF model, several assumptions were made based on the key economic trends and industry outlook.

CV NOPLAT Growth Rate: In our model, we projected a 1.8% CV year net operating profit less adjusted taxes (NOPLAT) as we expect the economy to be slowly recovering from COVID-19 outbreak. This was driven by taking into account of the regular growth of GDP at 2%, we expect the economy to slowly return to the 2% level. Thus, having 1.8% rate as estimate seems more stable in forecasting. Also, even though the Fed is currently buying back corporate debt, we do not expect this momentum to continue until the CV year, thus we forecast CV year growth to align with the potential GDP growth [3].

Rating Revenue: We forecasted an annual average growth rate of 7.5% in the rating revenue due to the increasing debt issuances, and corporate debt buyback by the Fed as the result from current recession. MCO, as one of the largest rating company, will benefit from the recent increase in debt issuances and the Fed's decision more than the smaller competitors. Hence we forecasted a 7.5% annual average growth rate, which is 1.5% higher than the company's historical average growth rate.

Research, Data & Analytics Revenue Growth Rate: This revenue segment is belonged to the Moody's Analytics revenue segment. This sub-segment is where Moody's provide online researches on data provision to their subscribed customers. We forecast this sub-segment revenue to grow 1% higher than the company's historical average of 11% as the market remains volatile due to the U.S. presidential election, increasing tension between U.S. and China, etc. This will result in more demand in more professional researches on the economic and credit analysis on the debt issuers.

Cost and Margin Growth: In general, we projected an average annual growth rate in gross margin of 71.53% driven by 11% growth in total revenue going forward and 9% average growth rate in operating expenses. Total revenue is expected to grow at an average annualized growth rate of 11% driven from continuous growth in debt market issuance and higher demand in professional research. On the other hand, as demand in researches increase, there will be needs to hire more employees. As a result, we expect higher growth rate of 9% in operating expense growth going forward [3].

Cost of Capital Assumptions: Driven by low interest rate environment and using Henry Fund estimated equity risk premium, we calculated a 7% cost of equity, cost of debt of 1.3, and 6.4% weighted average cost of capital. The Company has 89% common equity , and 11% debt in its market value.

CapEx Forecast and Technology Spending: We forecasted a 2% higher than historical average growth rate of 11% annual growth rate in capital expenditure. Given the demand for Moody's analytics is expected to grow, we expect there will be more needs for equipment. On the other hand, we forecasted a 17% annual average growth rate in technology spending (computer and software) as we expect Moody's to combat the possibilities of more advance technology replacing the traditional rating agencies services [3].

Earnings Estimates Relative to Consensus: We forecasted a $8.8 EPS in 2020, and $9.89 EPS in 2021. In the meanwhile, the consensus's projected a $9.42 EPS in 2020, and $9.91 EPS in 2021. For the estimates in 2020, our projected EPS is lower than the consensus because we estimate a more conservative revenue growth in 2020 as we forecast four consecutive annual EPS. As a result, our forecasted EPS in 2021 is aligned with the consensus [3].

Debt Maturity: MCO has total debt of $6376mm of corporate debt with average maturity of 13 years. Each year from 2020-2030, the average debt at maturity is around $500mm [5]. Average debt rating is BBB+ rated by both S&P, and Fitch. With average total revenue of $6696mm from 2020-2024, MCO will be able to pay off its debts.

From all of assumptions above, we estimate a target price of $305 using DCF/EP, $315 using DDM models, and $305 using relative valuation multiples [3]. Particularly, we believe that DCF model shows more perspectives on MCO's fundamental metrics. While DDM, based on the operating metrics, shows more growth in MCO's dividends. Relative valuation shows peer comparison within this industry. Each model exhibits different perspectives hence it is more robust to project the target price based on three analysis conclusions collectively. To summarize, the target price for Moody's Co. is between $305 to $315 with an upside of 12% potential [3].

KEYS TO MONITOR

Overall, we recommend a buy rating for Moody's Co. with 9% potential upside with increasing volume in debt issuance, outperformance in revenue, and its strong pricing power with large market shares in the industry.

Bull Case at $315: We project $315 target price in the case when the outperformance among peer group continues to stand, and the rise in credit market issuances continues to grow. We see MCO is in strong position compared to peers in the industry as it is one of the largest rating agencies and exhibits stable dividend growth. Lastly, because of its position as one of the largest rating agency, MCO also has more flexibility to rise its rating subscription price as the demand rises. In addition, from client's perspectives, the cost of switching rating agency could be high.

Bear Case at $305: We project $305 target price in the case if the economy sharply recovers where credit market issuance lost momentum due to the increase in interest rate, further regulation, and emergence of new technological rating system. In particular, more regulations in this industry will add higher fixed cost to Moody's. On the other hand, if the technology continues to advance, there could be increasing demand to rely on machines for credit assessments, potentially with lower costs.

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IMPORTANT DISCLAIMER

Moody's Corporation

Revenue Decomposition - All figures in millions of U.S. Dollar

Fiscal Years Ending Dec. 31	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Total Revenue	**4,204**	**4,443**	**4,829**	**5,350**	**5,930**	**6,579**	**7,303**	**8,112**
YoY Growth %	16.6%	5.7%	8.7%	10.8%	10.9%	10.9%	11.0%	11.1%
Moody's Investors Service:	**2,774**	**2,712**	**2,875**	**3,218**	**3,603**	**4,033**	**4,515**	**5,055**
YoY Growth %	17.0%	-2.2%	6.0%	11.9%	11.9%	11.9%	11.9%	12.0%
Ratings	2,755	2,693	2,846	3,188	3,570	3,998	4,478	5,016
YoY Growth %	17.7%	-2.3%	5.7%	12.0%	12.0%	12.0%	12.0%	12.0%
Other Moody's Investors Services	19	19	29	31	33	35	37	39
YoY Growth %	-39.5%	2.7%	52.6%	6.0%	6.0%	6.0%	6.0%	6.0%
Moody's Analytics:	**1,430**	**1,731**	**1,954**	**2,131**	**2,328**	**2,546**	**2,788**	**3,057**
YoY Growth %	16.0%	21.0%	12.9%	9.1%	9.2%	9.4%	9.5%	9.7%
Research, Data & Analytics	833	1,121	1,273	1,426	1,597	1,788	2,003	2,243
YoY Growth %	24.7%	34.6%	13.6%	12.0%	12.0%	12.0%	12.0%	12.0%
Enterprise Risk Solutions	449	451	522	545	570	596	622	651
YoY Growth %	7.1%	0.5%	15.7%	4.5%	4.5%	4.5%	4.5%	4.5%
Professional Services	149	159	159	160	161	161	162	163
YoY Growth %	1.4%	6.7%	0.0%	0.5%	0.5%	0.5%	0.5%	0.5%
Total Revenue	**4,204**	**4,443**	**4,829**	**5,350**	**5,930**	**6,579**	**7,303**	**8,112**

Moody's Corporation

Income Statement- All figures in millions of U.S. Dollar

Fiscal Years Ending Dec. 31	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Revenue	**4,204**	**4,443**	**4,829**	**5,350**	**5,930**	**6,579**	**7,303**	**8,112**
Total expenses	**(2,395)**	**(2,575)**	**(2,831)**	(3,086)	(3,404)	(3,759)	(4,154)	(4,594)
Operating	(1,223)	(1,246)	(1,387)	(1,523)	(1,688)	(1,873)	(2,079)	(2,309)
Selling, general and administrative	(991)	(1,080)	(1,167)	(1,230)	(1,364)	(1,513)	(1,680)	(1,866)
Restructuring	-	(49)	(60)	(60)	(60)	(60)	(60)	(60)
Depreciation and amortization	(158)	(192)	(200)	(273)	(292)	(313)	(335)	(359)
Acquisition-related expenses	(23)	(8)	(3)	-	-	-	-	-
Settlement charge & Impariment pursuant to the planned divestiture of MASKS	-	-	(14)	-	-	-	-	-
Operating income	**1,809**	**1,868**	**1,998**	**2,263**	**2,526**	**2,820**	**3,149**	**3,518**
Total non-operating income / expense, net	**(22)**	**(197)**	**(188)**	**(149)**	**(154)**	**(154)**	**(145)**	**(122)**
Interest expense / income, net	(188)	(216)	(208)	**(179)**	**(199)**	**(221)**	**(246)**	**(274)**
Other non-operating income / expense, net	(5)	19	20	30	45	68	101	152
Purchase price hedge gain & ICRA gain	171	-	-	-	-	-	-	-
Income before provision for income taxes	**1,787**	**1,671**	**1,810**	**2,114**	**2,372**	**2,666**	**3,004**	**3,395**
Provision for income taxes	(779)	(352)	(381)	(444)	(498)	(560)	(631)	(713)
Net income	**1,008**	**1,319**	**1,429**	**1,670**	**1,874**	**2,106**	**2,373**	**2,682**
Net income avaliable to Common shareholders	**1,001**	**1,310**	**1,422**	**1,662**	**1,865**	**2,096**	**2,361**	**2,669**
Basic EPS	5.24	6.84	7.51	8.80	9.89	11.13	12.56	14.20
Basic Weighted Average Shares	191	192	189	189	189	188	188	188
Dividend Per Share	1.52	1.76	2.00	2.29	2.57	2.89	3.27	3.69
Dividend Paid	290	337	379	432	485	545	614	694

Moody's Corporation

Balance Sheet - All figures in millions of U.S. Dollar

Fiscal Years Ending Dec. 31	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Assets								
Cash	1,072	1,685	1,832	3,381	5,630	8,108	10,851	13,900
Total Short Term Investments	112	133	98	160	178	197	219	243
Accounts Receivables, Net	1,147	1,287	1,419	1,337	1,483	1,645	1,826	2,028
Other Current Assets	250	282	330	642	712	789	876	973
Prepaid Expenses	203	202	150	428	474	526	584	649
Miscellaneous Current Assets	48	80	180	214	237	263	292	324
Total Current Assets	**2,581**	**3,387**	**3,679**	5,521	8,002	10,740	13,772	17,144
Net Property, Plant & Equipment	**325**	**320**	**748**	**803**	**859**	**920**	**986**	**1,056**
Computer Software and Equipment	740	816	619	884	980	1,087	1,207	1,340
Other Property, Plant & Equipment	291	295	512	562	623	691	767	852
Operating Lease Right-of-Use Assets	-	-	456	304	325	349	373	400
Accumulated Depreciation	(706)	(790)	(839)	(947)	(1,069)	(1,206)	(1,361)	(1,536)
Total Investments and Advances	**134**	**137**	**223**	**166**	**184**	**205**	**227**	**252**
Total Intangible Assets	**5,385**	**5,347**	**5,220**	**5,174**	**5,129**	**5,085**	**5,043**	**5,003**
Goodwill	3,753	3,781	3,722	3,722	3,722	3,722	3,722	3,722
Other Intangible Assets	1,632	1,566	1,498	1,452	1,407	1,363	1,321	1,281
Deferred Tax Assets	**144**	**197**	**229**	**185**	**208**	**233**	**263**	**297**
Other Assets	**26**	**137**	**166**	**170**	**189**	**210**	**233**	**258**
Total Assets	**8,594**	**9,526**	**10,265**	**11,410**	**13,724**	**16,336**	**19,288**	**22,628**
Liabilities & Shareholders' Equity:								
Total Liabilities:								
ST Debt & Curr. Portion LT Debt	429	450	89	110	137	169	210	260
Accounts Payable	22	30	38	36	40	45	50	55
Income Tax Payable	79	71	73	67	74	83	92	102
Other Current Liabilities	1,533	1,547	1,712	1,876	2,079	2,307	2,561	2,844
Total Current Liabilities	**2,063**	**2,099**	**1,912**	**2,090**	**2,331**	**2,604**	**2,912**	**3,262**
Total Long Term Liabilities	**6,646**	**6,771**	**7,516**	**7,362**	**8,164**	**9,060**	**10,062**	**11,182**
Long-Term Debt	5,111	5,226	6,066	5,857	6,493	7,203	7,995	8,881
Provision for Risks & Charges	635	745	819	794	880	976	1,083	1,203
Deferred Tax Liabilities	342	352	357	215	242	272	306	346
Other Liabilities (excl. Deferred Income)	418	326	162	326	361	401	445	494
Deferred Income	140	122	112	170	189	210	233	258
Total Liabilities	**8,709**	**8,870**	**9,428**	**9,452**	**10,495**	**11,664**	**12,974**	**14,444**
Total Shareholders' Equity:	**(328)**	**460**	**612**	**1,717**	**2,971**	**4,396**	**6,018**	**7,868**
Common Equity:	532	604	645	690	738	790	845	904
Common Stock Par/Carry Value	3	3	3	3	3	3	3	3
Additional Paid-In Capital/Capital Surplus	529	601	642	687	735	786	842	900
Retained Earnings	7,465	8,594	9,656	10,894	12,283	13,845	15,604	17,592
Accumulated Other Comprehensive Income:	(175)	(426)	(439)	(432)	(426)	(422)	(418)	(415)
Accumulated Other Comprehensive Income Other Appropriated Reserves	(61)	(53)	(38)	(31)	(25)	(21)	(17)	(14)
Cumulative Translation Adjustment/Unrealized For. Exch. Gain	(114)	(373)	(401)	(401)	(401)	(401)	(401)	(401)
Unrealized Gain/Loss Marketable Securities	2	-	-	-	-	-	-	-
Treasury Stock	(8,153)	(8,313)	(9,250)	(9,435)	(9,624)	(9,816)	(10,012)	(10,213)
Total Shareholders' Equity	**(328)**	**460**	**612**	**1,717**	**2,971**	**4,396**	**6,018**	**7,868**
Accumulated Minority Interest	**213**	**197**	**225**	**241**	**258**	**276**	**295**	**316**
Total Liabilities & Shareholders' Equity	**8,594**	**9,526**	**10,265**	11,410	13,724	16,336	19,288	22,628

Moody's Corporation

Historical Cash Flow Statement - All figures in millions of U.S. Dollar

Fiscal Years Ending Dec. 31	2017	2018	2019
Operating Activities			
Net Income / Starting Line	**1,008**	**1,319**	**1,429**
Depreciation, Depletion & Amortization	158	192	200
Depreciation and Depletion	97	90	97
Amortization of Intangible Assets	61	102	103
Deferred Taxes & Investment Tax Credit	88	(99)	(38)
Deferred Taxes	88	(99)	(38)
Other Funds	(48)	130	188
Funds from Operations	1,206	1,543	1,779
Changes in Working Capital	(459)	(82)	(88)
Receivables	(148)	(136)	(134)
Accounts Payable	(651)	(134)	77
Other Assets/Liabilities	341	189	(31)
Net Operating Cash Flow	**748**	**1,461**	**1,691**
Investing Activities			
Capital Expenditures	(91)	(90)	(69)
Capital Expenditures (Fixed Assets)	(91)	(90)	(69)
Net Assets from Acquisitions	(3,520)	(289)	(174)
Sale of Fixed Assets & Businesses	-	6	226
Purchase/Sale of Investments	68	(32)	36
Purchase of Investments	170	193	138
Sale/Maturity of Investments	239	161	174
Other Funds	113	-	5
Other Uses	-	-	(7)
Other Sources	113	-	12
Net Investing Cash Flow	**(3,429)**	**(406)**	**24**
Financing Activities			
Cash Dividends Paid	(290)	(337)	(378)
Change in Capital Stock	(193)	(218)	(1,023)
Repurchase of Common & Preferred Stk.	(249)	(265)	(1,068)
Sale of Common & Preferred Stock	56	47	45
Proceeds from Stock Options	56	47	45
Issuance/Reduction of Debt, Net	2,102	148	(163)
Change in Current Debt	130	(131)	(19)
Change in Long-Term Debt	1,972	279	(144)
Issuance of Long-Term Debt	2,272	1,079	806
Reduction in Long-Term Debt	(300)	(800)	(950)
Other Funds	(3)	(4)	(3)
Other Uses	(3)	(4)	(3)
Other Sources	-	-	-
Net Financing Cash Flow	**1,616**	**(412)**	**(1,567)**
Exchange Rate Effect	85	(30)	(1)
Net Change in Cash	**(980)**	**614**	**147**
Free Cash Flow	**657**	**1,371**	**1,622**

Moody's Corporation

Forecasted Cash Flow Statement

Fiscal Years Ending Dec. 31	2020E	2021E	2022E	2023E	2024E
Net Income	1,670	1,874	2,106	2,373	2,682
Add: Depreciation and amortization	273	292	313	335	359
Changes in working capital accounts:					
Increase in recerivables	82	(145)	(162)	(181)	(202)
Increase in prepaid expenses and other current asset	(312)	(70)	(78)	(87)	(97)
Increase in accounts payable	(2)	4	4	5	6
Increase in income tax payable	(6)	7	8	9	10
Increase in other current liabilities	164	204	227	254	284
Increase in deferred taxes	(98)	4	4	5	6
Net cash provided by operating acitivities	**1,772**	**2,170**	**2,423**	**2,713**	**3,047**
Cash from investing activities:					
Decrease in short-term investment	(62)	(17)	(19)	(22)	(24)
Decrease in total investment and advances	57	(18)	(20)	(23)	(25)
Capital expenditures	(328)	(349)	(374)	(401)	(429)
Capitalization of intangible assets	46	45	43	42	41
Decrease in other assets	(4)	(18)	(21)	(23)	(26)
Net cash provided by operating acitivities	**(292)**	**(358)**	**(391)**	**(426)**	**(464)**
Cash from financing activities:					
Change in Capital Stock	0.01	0.02	0.02	0.02	0.02
Change in additional paid in capital	45	48	51	55	59
Cumulative Translation Adjustment/Unrealized For. Exch. Gain	401	401	401	401	401
Unrealized Gain/Loss Marketable Securities	-	-	-	-	-
Other Appropriated Reserves	31	25	21	17	14
Change in long term debt	209	636	710	793	885
Payments of dividends	(432)	(485)	(545)	(614)	(694)
Repurchase of common stock	(185)	(189)	(192)	(196)	(200)
Net cash provided by financing acitivities	**69**	**437**	**446**	**455**	**465**
Net Increase/decrease in cash	**1,549**	**2,249**	**2,479**	**2,743**	**3,048**
Cash, Beginning of year	1,832	3,381	5,630	8,108	10,851
Cash, End of year	**3,381**	**5,630**	**8,108**	**10,851**	**13,900**

Moody's Corporation

Common Size Income Statement, as % of sales

Fiscal Years Ending Dec. 31	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Revenue	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Total expenses	-56.97%	-57.95%	-58.62%	-57.69%	-57.41%	-57.14%	-56.88%	-56.63%
Operating	-29.09%	-28.03%	-28.72%	-28.47%	-28.47%	-28.47%	-28.47%	-28.47%
Selling, general and administrative	-23.58%	-24.31%	-24.17%	-23.00%	-23.00%	-23.00%	-23.00%	-23.00%
Restructuring	0.00%	-1.10%	-1.24%	-1.12%	-1.01%	-0.91%	-0.82%	-0.74%
Depreciation and amortization	-3.77%	-4.32%	-4.14%	-5.10%	-4.93%	-4.76%	-4.59%	-4.43%
Acquisition-related expenses	-0.54%	-0.19%	-0.06%	0.00%	0.00%	0.00%	0.00%	0.00%
Settlement charge & Impariment pursuant to the planned divestiture of MASKS	0.00%	0.00%	-0.29%	0.00%	0.00%	0.00%	0.00%	0.00%
Operating income	43.03%	42.05%	41.38%	42.31%	42.59%	42.86%	43.12%	43.37%
Total non-operating income / expense, net	-0.53%	-4.44%	-3.89%	-2.79%	-2.59%	-2.34%	-1.98%	-1.51%
Interest expense / income, net	-4.48%	-4.86%	-4.31%	-3.35%	-3.35%	-3.36%	-3.37%	-3.38%
Other non-operating income / expense, net	-0.11%	0.42%	0.41%	0.56%	0.76%	1.03%	1.39%	1.87%
Purchase price hedge gain & ICRA gain	4.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Income before provision for income taxes	42.50%	37.61%	37.48%	39.52%	40.00%	40.53%	41.14%	41.86%
Provision for income taxes	-18.53%	-7.91%	-7.89%	-8.30%	-8.40%	-8.51%	-8.64%	-8.79%
Net income	23.97%	29.70%	29.59%	31.22%	31.60%	32.02%	32.50%	33.07%
Net income avaliable to Common shareholders	23.80%	29.48%	29.45%	31.07%	31.44%	31.86%	32.33%	32.90%

Moody's Corporation

Common Size Balance Sheet, as % of total asset

Fiscal Years Ending Dec. 31	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Assets								
Cash	12.47%	17.69%	17.85%	29.63%	41.02%	49.63%	56.26%	61.43%
Total Short Term Investments	1.30%	1.39%	0.95%	1.41%	1.30%	1.21%	1.14%	1.08%
Accounts Receivables, Net	13.35%	13.51%	13.82%	11.72%	10.80%	10.07%	9.47%	8.96%
Other Current Assets	2.91%	2.96%	3.21%	5.63%	5.19%	4.83%	4.54%	4.30%
Prepaid Expenses	2.36%	2.12%	1.46%	3.75%	3.46%	3.22%	3.03%	2.87%
Miscellaneous Current Assets	0.55%	0.84%	1.75%	1.88%	1.73%	1.61%	1.51%	1.43%
Total Current Assets	30.03%	35.55%	35.84%	48.39%	58.31%	65.74%	71.41%	75.77%
Net Property, Plant & Equipment	3.78%	3.36%	7.29%	7.04%	6.26%	5.63%	5.11%	4.67%
Computer Software and Equipment	8.61%	8.56%	6.03%	7.75%	7.14%	6.65%	6.26%	5.92%
Other Property, Plant & Equipment	3.39%	3.10%	4.99%	4.92%	4.54%	4.23%	3.98%	3.76%
Operating Lease Right-of-Use Assets	0.00%	0.00%	4.44%	2.66%	2.37%	2.13%	1.94%	1.77%
Accumulated Depreciation	-8.21%	-8.30%	-8.17%	-8.30%	-7.79%	-7.38%	-7.06%	-6.79%
Total Investments and Advances	1.55%	1.44%	2.17%	1.46%	1.34%	1.25%	1.18%	1.11%
Total Intangible Assets	62.66%	56.13%	50.85%	45.35%	37.37%	31.13%	26.15%	22.11%
Goodwill	43.67%	39.69%	36.26%	32.62%	27.12%	22.78%	19.30%	16.45%
Other Intangible Assets	18.98%	16.44%	14.59%	12.72%	10.25%	8.35%	6.85%	5.66%
Deferred Tax Assets	1.67%	2.07%	2.23%	1.62%	1.51%	1.43%	1.36%	1.31%
Other Assets	0.31%	1.44%	1.62%	1.49%	1.38%	1.28%	1.21%	1.14%
Total Assets	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Liabilities & Shareholders' Equity:								
Total Liabilities:								
ST Debt & Curr. Portion LT Debt	5.00%	4.72%	0.87%	0.97%	1.00%	1.04%	1.09%	1.15%
Accounts Payable	0.25%	0.32%	0.37%	0.32%	0.29%	0.27%	0.26%	0.24%
Income Tax Payable	0.92%	0.75%	0.71%	0.59%	0.54%	0.51%	0.48%	0.45%
Other Current Liabilities	17.84%	16.24%	16.68%	16.44%	15.15%	14.12%	13.28%	12.57%
Total Current Liabilities	24.01%	22.03%	18.63%	18.32%	16.99%	15.94%	15.10%	14.42%
Total Long Term Liabilities	77.33%	71.08%	73.22%	64.52%	59.49%	55.46%	52.17%	49.42%
Long-Term Debt	59.47%	54.86%	59.09%	51.33%	47.31%	44.09%	41.45%	39.25%
Provision for Risks & Charges	7.39%	7.82%	7.98%	6.96%	6.41%	5.97%	5.62%	5.32%
Deferred Tax Liabilities	3.97%	3.69%	3.48%	1.89%	1.76%	1.66%	1.59%	1.53%
Other Liabilities (excl. Deferred Income)	4.87%	3.42%	1.58%	2.86%	2.63%	2.45%	2.31%	2.18%
Deferred Income	1.63%	1.28%	1.09%	1.49%	1.38%	1.28%	1.21%	1.14%
Total Liabilities	101.34%	93.11%	91.85%	82.84%	76.47%	71.40%	67.27%	63.83%
Total Shareholders' Equity:	-3.81%	4.83%	5.96%	15.05%	21.65%	26.91%	31.20%	34.77%
Common Equity:	6.19%	6.34%	6.28%	6.05%	5.38%	4.83%	4.38%	3.99%
Common Stock Par/Carry Value	0.04%	0.04%	0.03%	0.03%	0.02%	0.02%	0.02%	0.01%
Additional Paid-In Capital/Capital Surplus	6.15%	6.31%	6.25%	6.02%	5.36%	4.81%	4.36%	3.98%
Retained Earnings	86.87%	90.22%	94.07%	95.48%	89.50%	84.75%	80.90%	77.75%
Accumulated Other Comprehensive Income:	-2.03%	-4.48%	-4.28%	-3.79%	-3.11%	-2.58%	-2.17%	-1.83%
Accumulated Other Comprehensive Income Other Appropriated Reserves	-0.71%	-0.56%	-0.37%	-0.27%	-0.18%	-0.13%	-0.09%	-0.06%
Cumulative Translation Adjustment/Unrealized For. Exch. Gain	-1.33%	-3.92%	-3.91%	-3.51%	-2.92%	-2.45%	-2.08%	-1.77%
Unrealized Gain/Loss Marketable Securities	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Treasury Stock	-94.87%	-87.26%	-90.11%	-82.69%	-70.12%	-60.09%	-51.91%	-45.13%
Total Shareholders' Equity	-3.81%	4.83%	5.96%	15.05%	21.65%	26.91%	31.20%	34.77%
Accumulated Minority Interest	2.48%	2.06%	2.19%	2.11%	1.88%	1.69%	1.53%	1.39%
Total Liabilities & Shareholders' Equity	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Moody's Corporation

Common Size Balance Sheet, as % of total sales

Fiscal Years Ending Dec. 31	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Assets								
Cash	25.49%	37.93%	37.94%	63.20%	94.93%	123.25%	148.59%	171.35%
Total Short Term Investments	2.66%	2.98%	2.03%	3.00%	3.00%	3.00%	3.00%	3.00%
Accounts Receivables, Net	27.29%	28.97%	29.38%	25.00%	25.00%	25.00%	25.00%	25.00%
Other Current Assets	5.95%	6.35%	6.83%	12.00%	12.00%	12.00%	12.00%	12.00%
Prepaid Expenses	4.82%	4.55%	3.11%	8.00%	8.00%	8.00%	8.00%	8.00%
Miscellaneous Current Assets	1.13%	1.81%	3.73%	4.00%	4.00%	4.00%	4.00%	4.00%
Total Current Assets	61.38%	76.24%	76.19%	103.20%	134.93%	163.25%	188.59%	211.35%
Net Property, Plant & Equipment	7.73%	7.21%	15.49%	15.01%	14.49%	13.99%	13.50%	13.02%
Computer Software and Equipment	17.60%	18.36%	12.82%	16.52%	16.52%	16.52%	16.52%	16.52%
Other Property, Plant & Equipment	6.93%	6.64%	10.60%	10.50%	10.50%	10.50%	10.50%	10.50%
Operating Lease Right-of-Use Assets	0.00%	0.00%	9.44%	5.68%	5.49%	5.30%	5.11%	4.93%
Accumulated Depreciation	-16.79%	-17.79%	-17.37%	-17.70%	-18.02%	-18.33%	-18.64%	-18.93%
Total Investments and Advances	3.18%	3.08%	4.62%	3.11%	3.11%	3.11%	3.11%	3.11%
Total Intangible Assets	128.08%	120.36%	108.10%	96.71%	86.49%	77.30%	69.06%	61.67%
Goodwill	89.27%	85.11%	77.08%	69.58%	62.76%	56.58%	50.97%	45.88%
Other Intangible Assets	38.81%	35.25%	31.02%	27.14%	23.72%	20.72%	18.09%	15.79%
Deferred Tax Assets	3.42%	4.44%	4.74%	3.46%	3.50%	3.55%	3.60%	3.66%
Other Assets	0.63%	3.09%	3.44%	3.19%	3.19%	3.19%	3.19%	3.19%
Total Assets	204.42%	214.42%	212.57%	213.28%	231.42%	248.31%	264.11%	278.96%
Liabilities & Shareholders' Equity:								
Total Liabilities:								
ST Debt & Curr. Portion LT Debt	10.21%	10.13%	1.84%	2.06%	2.31%	2.58%	2.88%	3.21%
Accounts Payable	0.52%	0.68%	0.79%	0.68%	0.68%	0.68%	0.68%	0.68%
Income Tax Payable	1.88%	1.61%	1.51%	1.26%	1.26%	1.26%	1.26%	1.26%
Other Current Liabilities	36.46%	34.82%	35.45%	35.07%	35.07%	35.07%	35.07%	35.07%
Total Current Liabilities	49.08%	47.23%	39.59%	39.06%	39.31%	39.58%	39.88%	40.21%
Total Long Term Liabilities	158.08%	152.41%	155.64%	137.62%	137.67%	137.72%	137.78%	137.86%
Long-Term Debt	121.57%	117.63%	125.62%	109.48%	109.48%	109.48%	109.48%	109.48%
Provision for Risks & Charges	15.10%	16.77%	16.96%	14.84%	14.84%	14.84%	14.84%	14.84%
Deferred Tax Liabilities	8.13%	7.92%	7.39%	4.03%	4.07%	4.13%	4.19%	4.26%
Other Liabilities (excl. Deferred Income)	9.95%	7.34%	3.35%	6.09%	6.09%	6.09%	6.09%	6.09%
Deferred Income	3.33%	2.75%	2.32%	3.19%	3.19%	3.19%	3.19%	3.19%
Total Liabilities	207.16%	199.65%	195.24%	176.68%	176.97%	177.30%	177.66%	178.07%
Total Shareholders' Equity:	-7.79%	10.35%	12.67%	32.10%	50.10%	66.83%	82.41%	97.00%
Common Equity:	12.65%	13.60%	13.36%	12.90%	12.45%	12.00%	11.57%	11.14%
Common Stock Par/Carry Value	0.08%	0.08%	0.06%	0.06%	0.05%	0.05%	0.04%	0.04%
Additional Paid-In Capital/Capital Surplus	12.57%	13.53%	13.29%	12.84%	12.39%	11.95%	11.52%	11.10%
Retained Earnings	177.57%	193.45%	199.96%	203.65%	207.13%	210.44%	213.67%	216.88%
Accumulated Other Comprehensive Income:	-4.15%	-9.60%	-9.09%	-8.08%	-7.19%	-6.41%	-5.72%	-5.11%
Accumulated Other Comprehensive Income Other Appropriate	-1.44%	-1.19%	-0.79%	-0.58%	-0.43%	-0.31%	-0.23%	-0.17%
Cumulative Translation Adjustment/Unrealized For. Exch. Gain	-2.71%	-8.40%	-8.30%	-7.50%	-6.76%	-6.10%	-5.49%	-4.94%
Unrealized Gain/Loss Marketable Securities	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Treasury Stock	-193.93%	-187.10%	-191.55%	-176.37%	-162.28%	-149.21%	-137.10%	-125.90%
Total Shareholders' Equity	-7.79%	10.35%	12.67%	32.10%	50.10%	66.83%	82.41%	97.00%
Accumulated Minority Interest	5.06%	4.43%	4.66%	4.50%	4.34%	4.19%	4.04%	3.89%
Total Liabilities & Shareholders' Equity	204.42%	214.42%	212.57%	213.28%	231.42%	248.31%	264.11%	278.96%

Moody's Corporation

Value Driver Estimation

Fiscal Years Ending Dec. 31	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Revenue	4,204	4,443	4,829	5,350	5,930	6,579	7,303	8,112
+Depreciation Expense	158	192	200	273	292	313	335	359
Operating Expenses:								
-Operating	(1,223)	(1,246)	(1,387)	(1,523)	(1,688)	(1,873)	(2,079)	(2,309)
-SG&A	(991)	(1,080)	(1,167)	(1,230)	(1,364)	(1,513)	(1,680)	(1,866)
-Depreciation and amortization	(158)	(192)	(200)	(273)	(292)	(313)	(335)	(359)
+Implied interest on operating leases	9	9	9	9	20	21	23	25
EBITA	**1,999**	**2,126**	**2,284**	**2,605**	**2,898**	**3,214**	**3,567**	**3,961**
Adjusted Taxes								
Income tax provision	779	352	381	444	498	560	631	713
+tax shield on interest expense	40	45	44	38	42	46	52	58
-tax on investment income	(36)	-	-	-	-	-	-	-
+tax shield on amoritized goodwill	33	40	42	57	61	66	70	75
+ tax shield on acquisition-related expenses	4.7	1.7	0.6	-	-	-	-	-
+tax on settlement charge & Impariment pursuant to the planned divestiture of MASKS	-	-	(3)	-	-	-	-	-
+tax on operating leases	2	2	2	2	4	5	5	5
+tax on nonoperating income	(1)	4	4	6	9	14	21	32
Total adjusted taxes	**822**	**445**	**470**	**547**	**615**	**691**	**779**	**883**
NOPLAT Calculation:								
EBITA	1,999	2,126	2,284	2,605	2,898	3,214	3,567	3,961
-total adjusted taxes	(822)	(445)	(470)	(547)	(615)	(691)	(779)	(883)
+change in deferred taxes	410	(43)	(27)	(98)	4	4	5	6
NOPLAT	**1,587**	**1,638**	**1,787**	**1,960**	**2,287**	**2,528**	**2,793**	**3,084**
Net Operating Working Capital								
normal Cash	1,072	1,132	1,231	1,363	1,511	1,677	1,861	2,067
+account receivable	1,147	1,287	1,419	1,337	1,483	1,645	1,826	2,028
+other current assets	250	282	330	642	712	789	876	973
-account payable	(22)	(30)	(38)	(36)	(40)	(45)	(50)	(55)
-income tax payable	(79)	(71)	(73)	(67)	(74)	(83)	(92)	(102)
-other current liabilities	(1,533)	(1,547)	(1,712)	(1,876)	(2,079)	(2,307)	(2,561)	(2,844)
Net Operating Working Capital	**835**	**1,053**	**1,157**	**1,363**	**1,511**	**1,677**	**1,861**	**2,067**
Invested Capital								
Net operating working capital	835	1,053	1,157	1,363	1,511	1,677	1,861	2,067
+Net PPE	325	320	748	803	859	920	986	1,056
+other long term operating assets	26	137	166	170	189	210	233	258
+net intangible assets	1,632	1,566	1,498	1,452	1,407	1,363	1,321	1,281
+other assets	26	137	166	170	189	210	233	258
-deferred income	(140)	(122)	(112)	(170)	(189)	(210)	(233)	(258)
-other long term operating liabilities	(418)	(326)	(162)	(326)	(361)	(401)	(445)	(494)
+PV of operating lease	684	663	668	1,536	1,645	1,762	1,887	2,021
Invested Capital	**2,970**	**3,429**	**4,128**	**4,999**	**5,250**	**5,531**	**5,843**	**6,189**
Free Cash Flow (FCF):								
NOPLAT	1,587	1,638	1,787	1,960	2,287	2,528	2,793	3,084
Change in IC	1,985	459	700	870	252	281	312	346
FCF	**3,572**	**2,096**	**2,487**	**2,831**	**2,538**	**2,808**	**3,105**	**3,430**
Return on Invested Capital (ROIC):								
NOPLAT	1,587	1,638	1,787	1,960	2,287	2,528	2,793	3,084
/Beg. IC	985	2,970	3,429	4,128	4,999	5,250	5,531	5,843
ROIC	**161%**	**55%**	**52%**	**47%**	**46%**	**48%**	**50%**	**53%**
Economic Profit (EP):								
Beg. IC	985	2,970	3,429	4,128	4,999	5,250	5,531	5,843
x (ROIC - WACC)	155%	49%	46%	41%	39%	42%	44%	46%
EP	**1,524**	**1,448**	**1,568**	**1,697**	**1,968**	**2,193**	**2,440**	**2,711**

Moody's Corporation

Weighted Average Cost of Capital (WACC) Estimation

Cost of Equity:		
Risk-Free Rate	0.68%	
Beta	1.23	
Equity Risk Premium	5.15%	
Cost of Equity	**7.01%**	
Cost of Debt:		
Pre-Tax Cost of Debt	1.65%	
Marginal Tax Rate	21%	
After-Tax Cost of Debt	**1.30%**	
Market Value of Common Equity:		**MV Weights**
Total Shares Outstanding	189	
Current Stock Price	$285.40	
MV of Equity	**54,026.22**	88.79%
Market Value of Debt:		
Short-Term Debt & Current Portion of LTD	89	
Long-Term Debt	6,066	
PV of Operating Leases	668	
MV of Total Debt	**6,822.91**	11.21%
Market Value of the Firm	**60,849.13**	100.00%
	Estimated WACC	**6.37%**

Moody's Corporation

Discounted Cash Flow (DCF) and Economic Profit (EP) Valuation Models

Key Inputs:	
CV Growth of NOPLAT	1.80%
CV Year ROIC	52.78%
WACC	6.37%
Cost of Equity	7.01%
CV NOPLAT	3,084

Fiscal Years Ending Dec. 31	2020E	2021E	2022E	2023E	2024E
DCF Model:					
Free Cash Flow (FCF)	2,831	2,538	2,808	3,105	3,430
Continuing Value (CV)					65,120
PV of FCF	2,661	2,243	2,333	2,425	50,860
Value of Operating Assets:	60,522				
Non-Operating Adjustments:					
+ST Investment Securities	160				
+Excess cash	2,018				
-PV of operating lease	(1,536)				
+ESOP	194				
-Debt	(6,155)				
-Provision for Risks & Charges	(794)				
Value of Equity	54,409				
Shares Outstanding	189.3				
Intrinsic Value of Last FYE	$ 287.42				
Implied Price as of Today	$ 301.98				
EP Model:					
Economic Profit (EP)	1,697	1,968	2,193	2,440	2,711
Continuing Value (CV)					59,277
PV of EP	1,595	1,739	1,822	1,906	46,296
Total PV of EP	53,359				
Invested Capital (last FYE)	4,128				
Value of Operating Assets:	60,522				
Non-Operating Adjustments					
+ST Investment Securities	160				
+Excess cash	2,018				
-PV of operating lease	(1,536)				
+ESOP	194				
-Debt	(6,155)				
-Provision for Risks & Charges	(794)				
Value of Equity	54408.7				
Shares Outstanding	189.3				
Intrinsic Value of Last FYE	$ 287.42				
Implied Price as of Today	$ 301.98				

Moody's Corporation

Dividend Discount Model (DDM) or Fundamental P/E Valuation Model

Fiscal Years Ending Dec. 31	2020E	2021E	2022E	2023E	2024E
EPS	$ 8.80	$ 9.89	$ 11.13	$ 12.56	$ 14.20
Key Assumptions					
CV growth of EPS	3.70%				
CV Year ROE	33.92%				
Cost of Equity	7.01%				
Future Cash Flows					
P/E Multiple (CV Year)					26.88
EPS (CV Year)					$ 14.20
Future Stock Price					381.6209
Dividends Per Share	2.29	2.57	2.89	3.27	3.69
Discounted Cash Flows	2.14	2.24	2.36	2.49	290.98
Intrinsic Value as of Last FYE	$ 300.21				
Implied Price as of Today	$ 315.42				

Moody's Corporation

Relative Valuation Models

Ticker	Company	Price	EPS 2020E	EPS 2021E	P/E 20	P/E 21
INFO	IHS Markit	$79.79	$2.79	$3.17	28.60	25.17
SPGI	S&P Global	$354.00	$11.07	$11.60	31.98	30.52
MORN	Morningstar	$184.40	$4.25	$4.25	43.39	43.39
				Average	**34.66**	**33.03**
MCO	Moody's Corporation	$285.40	8.80	9.89	32.4	28.9

Implied Relative Value:

P/E (EPS20)	**$ 304.85**
P/E (EPS21)	**$ 326.52**

Moody's Corporation

Key Management Ratios

Fiscal Years Ending Dec. 31	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Liquidity Ratios:								
Current ratio (current assets/current liabilities)	1.25	1.61	1.92	2.64	3.43	4.12	4.73	5.26
Quick ratio (cash+securities+receivables)/current liabilities)	0.57	0.87	1.01	1.69	2.49	3.19	3.80	4.34
Operating CF ratio (operating cash flow/ current liabilities)	0.36	0.70	0.88	0.85	0.93	0.93	0.93	0.93
Asset-Management Ratios:								
Total asset turnover (total revenue/avg assets)	0.46	0.45	0.45	0.43	0.39	0.37	0.35	0.72
Accounts receivable turnover (total revenue/ avg receivables)	3.45	3.28	3.50	3.79	3.79	3.79	3.79	8.00
Net working capital turnover (net sales/ working capital)	5.04	4.22	4.17	3.92	3.92	3.92	3.92	3.92
Financial Leverage Ratios:								
Debt ratio (total debt/total assets)	0.64	0.60	0.60	0.52	0.48	0.45	0.43	0.40
Debt to equity ratio (debt/avg equity)	83.82	10.59	5.29	2.55	1.80	1.42	1.18	2.32
LT Debt to Assets (LT debt/avg assets)	0.56	0.53	0.56	0.47	0.43	0.40	0.38	0.78
Profitability Ratios:								
Gross margin (total revenue - COGS/total revenue)	70.91%	71.97%	71.28%	71.53%	71.53%	71.53%	71.53%	71.53%
Free Cash Flow margin (free cash flow/sales)	84.97%	47.18%	51.49%	52.91%	42.80%	42.69%	42.52%	42.29%
ROA (net income/ avg assets)	11.12%	13.33%	13.19%	13.29%	12.47%	11.83%	11.32%	23.71%
ROE (net income/ avg total equity)	1524.51%	246.18%	122.71%	71.25%	50.87%	40.45%	34.18%	68.18%
Payout Policy Ratios:								
Dividend Payout Ratio (Dividend/EPS)	29.01%	25.73%	26.63%	26.00%	26.00%	26.00%	26.00%	26.00%
Total Payout Ratio ((Divs. + Repurchases)/NI)	47.93%	40.44%	40.51%	25.87%	25.87%	25.87%	25.87%	25.87%

Moody's Corporation

Present Value of Operating Lease Obligations

Fiscal Years Ending Dec. 31	2014	2015	2016	2017	2018	2019
Year 1	93	95	102	108	106	106
Year 2	81	89	86	87	102	102
Year 3	78	83	75	81	96	96
Year 4	73	73	70	76	84	84
Year 5	65	69	67	73	81	81
Thereafter	447	417	344	291	247	247
Total Minimum Payments	838	826	744	715	716	716
Less: Cumulative Interest	78	73	60	52	48	48
PV of Minimum Payments	**759**	**753**	**684**	**663**	**668**	**668**
Implied Interest in Year 1 Payment		**13**	**12**	**11**	**11**	**11**
Pre-Tax Cost of Debt	1.65%	1.65%	1.65%	1.65%	1.65%	1.65%
Years Implied by Year 6 Payment	6.9	6.1	5.1	4.0	3.0	3.0
Expected Obligation in Year 6 & Beyond	64.9	68.7	67.2	72.6	81	81
Present Value of Lease Payments						
PV of Year 1	91.9	93.3	100.2	106.5	104.2	104.3
PV of Year 2	78.3	85.8	83.1	84.3	99.0	98.7
PV of Year 3	74.5	79.2	71.5	76.9	91.0	91.4
PV of Year 4	68.1	68.1	65.6	70.9	79.1	78.7
PV of Year 5	59.8	63.3	61.9	66.9	74.6	74.6
PV of 6 & beyond	386.6	363.1	301.4	257.1	219.8	220.2
Capitalized PV of Payments	759.2	752.8	683.8	662.6	667.7	667.9

Moody's Corporation

Effects of ESOP Exercise and Share Repurchases on Common Stock Account and Number of Shares Outstanding

Number of Options Outstanding (shares):	1.1
Average Time to Maturity (years):	4.00
Expected Annual Number of Options Exercised:	0.28
Current Average Strike Price:	$ 71.64
Cost of Equity:	7.01%
Current Stock Price:	$285.40

Fiscal Years Ending Dec. 31	**2020E**	**2021E**	**2022E**	**2023E**
Increase in Shares Outstanding:	0.28	0.28	0.28	0.28
Average Strike Price:	$ 71.64	$ 71.64	$ 71.64	$ 71.64
Increase in Common Stock Account:	**20**	**20**	**20**	**20**
Change in Treasury Stock	185	189	192	196
Expected Price of Repurchased Shares:	$ 285.40	$ 305.42	$ 326.84	$ 349.77
Number of Shares Repurchased:	**1**	**1**	**1**	**1**
Shares Outstanding (beginning of the year)	189	189	189	188
Plus: Shares Issued Through ESOP	0	0	0	0
Less: Shares Repurchased in Treasury	1	1	1	1
Shares Outstanding (end of the year)	**189**	**189**	**188**	**188**

Moody's Corporation

Valuation of Options Granted under ESOP

Current Stock Price	$285.40
Risk Free Rate	0.68%
Current Dividend Yield	0.80%
Annualized St. Dev. of Stock Returns	60.58%

Range of Outstanding Options	Number of Shares	Average Exercise Price	Average Remaining Life (yrs)	B-S Option Price	Value of Options Granted
Range 1	1.1	71.64	4.00	$ 176.00	$ 194
Total	1.1	$ 71.64	4.00	$ 224.82	**$ 194**

Moody's Corporation

Sensitivity Tables

DCF:

Beta

Equity Risk Premium

301.98	0.98	0.93	1.03	1.13	***1.23***	1.33	1.43	1.53	1.63	1.73
4.65%	472.67	509.24	440.81	387.98	345.95	311.71	283.28	259.28	238.75	220.99
4.75%	458.72	493.99	427.97	376.91	336.23	303.06	275.48	252.18	232.24	214.98
4.85%	445.54	479.58	415.82	366.42	327.01	294.83	268.06	245.43	226.05	209.25
4.95%	433.06	465.96	404.31	356.47	318.25	287.02	261.00	239.00	220.14	203.79
5.05%	421.22	453.05	393.38	347.01	309.92	279.57	254.28	232.87	214.51	198.58
5.15%	409.99	440.81	383.01	338.01	**301.98**	272.48	247.86	227.01	209.12	193.60
5.25%	399.31	429.18	373.13	329.44	294.41	265.70	241.74	221.42	203.98	188.83
5.35%	389.14	418.13	363.73	321.26	287.19	259.23	235.88	216.07	199.05	184.27
5.45%	379.45	407.60	354.76	313.46	280.28	253.04	230.27	210.95	194.33	179.90
5.55%	370.21	397.56	346.19	306.00	273.68	247.12	224.90	206.03	189.81	175.70
5.65%	361.38	387.98	338.01	298.86	267.35	241.44	219.75	201.32	185.47	171.67

CV NOPLAT Growth

WACC

301.98	1.72%	1.73%	1.74%	1.75%	**1.80%**	1.90%	1.91%	1.92%	1.93%	1.94%
5.98%	328.31	328.97	329.64	330.31	333.71	340.77	341.49	342.22	342.95	343.69
5.99%	327.46	328.12	328.78	329.45	332.83	339.85	340.57	341.29	342.02	342.75
6.09%	319.17	319.80	320.43	321.06	324.27	330.92	331.60	332.29	332.98	333.67
6.19%	311.25	311.85	312.45	313.05	316.10	322.41	323.05	323.70	324.36	325.01
6.29%	303.68	304.25	304.82	305.39	308.29	314.28	314.89	315.51	316.13	316.75
6.37%	297.56	298.11	298.65	299.20	**301.98**	307.72	308.31	308.90	309.50	310.09
6.49%	289.49	290.01	290.52	291.04	293.67	299.09	299.65	300.20	300.76	301.33
6.59%	282.84	283.33	283.82	284.31	286.82	291.98	292.51	293.04	293.57	294.11
6.69%	276.45	276.91	277.38	277.86	280.24	285.17	285.67	286.18	286.69	287.20
6.79%	270.31	270.76	271.21	271.66	273.94	278.64	279.12	279.60	280.08	280.57
6.89%	264.41	264.84	265.27	265.70	267.88	272.36	272.82	273.28	273.75	274.21

Moody's Research, Data & Analytics Growth rate for 2020E

operating expense as % of sales for 2020E

301.98	8.00%	9.00%	10.00%	11.00%	**12.00%**	13.00%	14.00%	15.00%	16.00%	17.00%
-23.00%	324.34	328.37	332.56	336.90	341.40	346.05	350.87	355.87	361.03	366.37
-24.00%	317.43	321.40	325.51	329.77	334.19	338.76	343.50	348.40	353.47	358.72
-25.00%	310.53	314.42	318.46	322.65	326.98	331.47	336.12	340.93	345.91	351.07
-26.00%	303.63	307.45	311.41	315.52	319.77	324.18	328.74	333.47	338.36	343.41
-27.00%	296.73	300.48	304.36	308.39	312.57	316.89	321.37	326.00	330.80	335.76
-28.47%	286.59	290.23	294.01	297.92	**301.98**	306.18	310.54	315.04	319.70	324.52
-29.00%	282.92	286.53	290.26	294.14	298.15	302.31	306.62	311.07	315.69	320.46
-30.00%	276.02	279.55	283.21	287.01	290.94	295.02	299.24	303.61	308.13	312.81
-31.00%	269.12	272.58	276.16	279.88	283.74	287.73	291.86	296.14	300.57	305.15
-32.00%	262.21	265.60	269.11	272.76	276.53	280.44	284.49	288.68	293.01	297.50
-33.00%	255.31	258.63	262.06	265.63	269.32	273.15	277.11	281.21	285.46	289.85

CV ROIC Rate

Risk Free Rate

301.98	48.78%	49.78%	50.78%	51.78%	**52.78%**	53.78%	54.78%	55.78%	56.78%	57.78%
0.18%	335.93	336.17	336.41	336.63	336.85	337.06	337.26	337.45	337.64	337.82
0.28%	328.39	328.63	328.86	329.08	329.29	329.49	329.69	329.88	330.06	330.23
0.38%	321.17	321.40	321.62	321.84	322.04	322.24	322.43	322.62	322.79	322.97
0.48%	314.23	314.46	314.68	314.89	315.09	315.28	315.47	315.65	315.82	315.99
0.58%	307.57	307.79	308.00	308.21	308.40	308.59	308.78	308.95	309.12	309.29
0.68%	301.16	301.38	301.59	301.79	**301.98**	302.17	302.35	302.52	302.68	302.84
0.78%	295.00	295.21	295.42	295.61	295.80	295.98	296.16	296.33	296.49	296.65
0.88%	289.07	289.28	289.48	289.67	289.85	290.03	290.20	290.37	290.52	290.68
0.98%	283.35	283.56	283.75	283.94	284.12	284.29	284.46	284.62	284.78	284.93
1.08%	277.84	278.04	278.23	278.42	278.59	278.76	278.93	279.08	279.24	279.38
1.18%	272.52	272.72	272.91	273.09	273.26	273.43	273.59	273.74	273.89	274.04

DDM:

CV EPS Growth

Cost of Equity

315.42	3.30%	3.40%	3.50%	3.60%	**3.70%**	3.80%	3.90%	4.00%	4.10%	4.20%
6.51%	334.50	343.84	353.81	364.46	375.87	388.12	401.32	415.56	430.98	447.74
6.61%	323.73	332.45	341.73	351.64	362.22	373.55	385.72	398.83	412.98	428.30
6.71%	313.59	321.75	330.42	339.64	349.47	359.99	371.25	383.34	396.35	410.41
6.81%	304.04	311.68	319.78	328.39	337.55	347.32	357.76	368.95	380.96	393.89
6.91%	295.02	302.19	309.78	317.83	326.38	335.48	345.18	355.55	366.66	378.59
7.01%	286.11	292.83	299.93	307.45	**315.42**	323.89	332.90	342.51	352.78	363.78
7.11%	278.40	284.74	291.44	298.51	306.00	313.94	322.38	331.36	340.93	351.17
7.21%	270.73	276.71	283.01	289.66	296.69	304.12	312.01	320.39	329.31	338.82
7.31%	263.45	269.09	275.03	281.29	287.89	294.87	302.26	310.09	318.42	327.28
7.41%	256.53	261.86	267.46	273.36	279.57	286.13	293.06	300.40	308.19	316.45
7.51%	249.93	254.97	260.27	265.83	271.69	277.86	284.38	291.27	298.56	306.29