Valuation of TATA, Mahindra and Maruti Suzuki through FCFF and FCFE models

Assignment-4

Submitted in partial fulfilment of the
requirements of the course

ECON F355 Business Analysis and Valuation

By

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Group Details

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Company Name: Tata Motors, Mahindra, Maruti Suzuki

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ABSTRACT

The purpose of this project is to do the valuation of three automobile companies namely, TATA Motors, Mahindra, Maruti Suzuki using different valuation methods. The valuation is done using 2-Stage DDM, 3-Stage DDM and FCFF, FCFE methods. Historical data was studied and interpreted to predict the future growth rate and the duration of this high growth. Based on the expected future cash flows, the current value of the company was determined. The future cash flows were discounted by an appropriate discount rate to get the present value.

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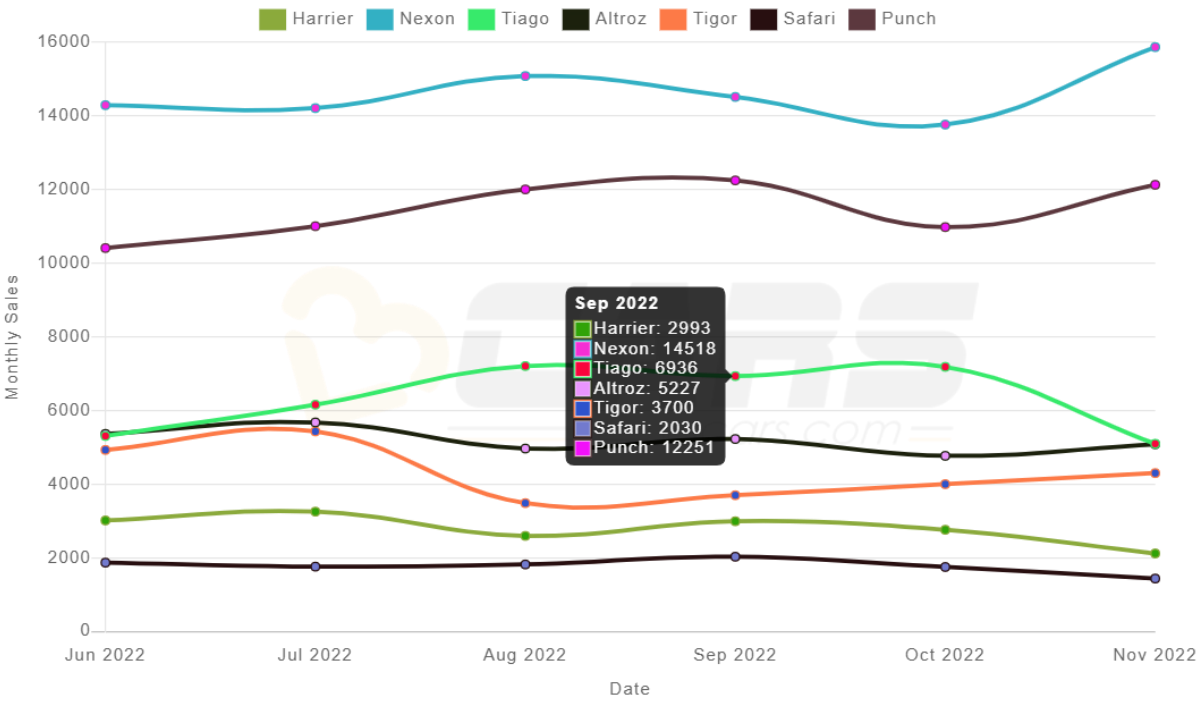
TATA Motors

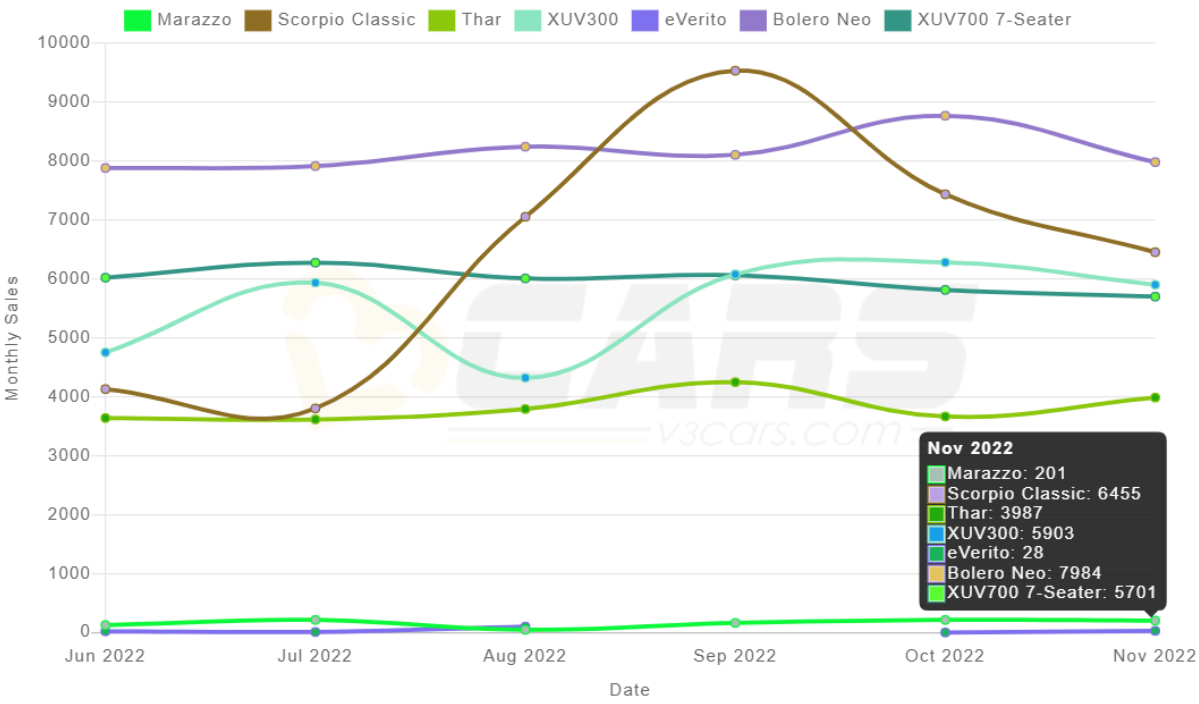
Tata Motors is a $42 billion company that manufactures a variety of automobiles and is a world leader in manufacturing. Their brand is well-known in more than 175 nations and has established itself as a serious rival in the world's auto market. It is one of India’s biggest car manufacturers.



The company has stable growth in the car segment with TATA Nexon being its highest sold product.

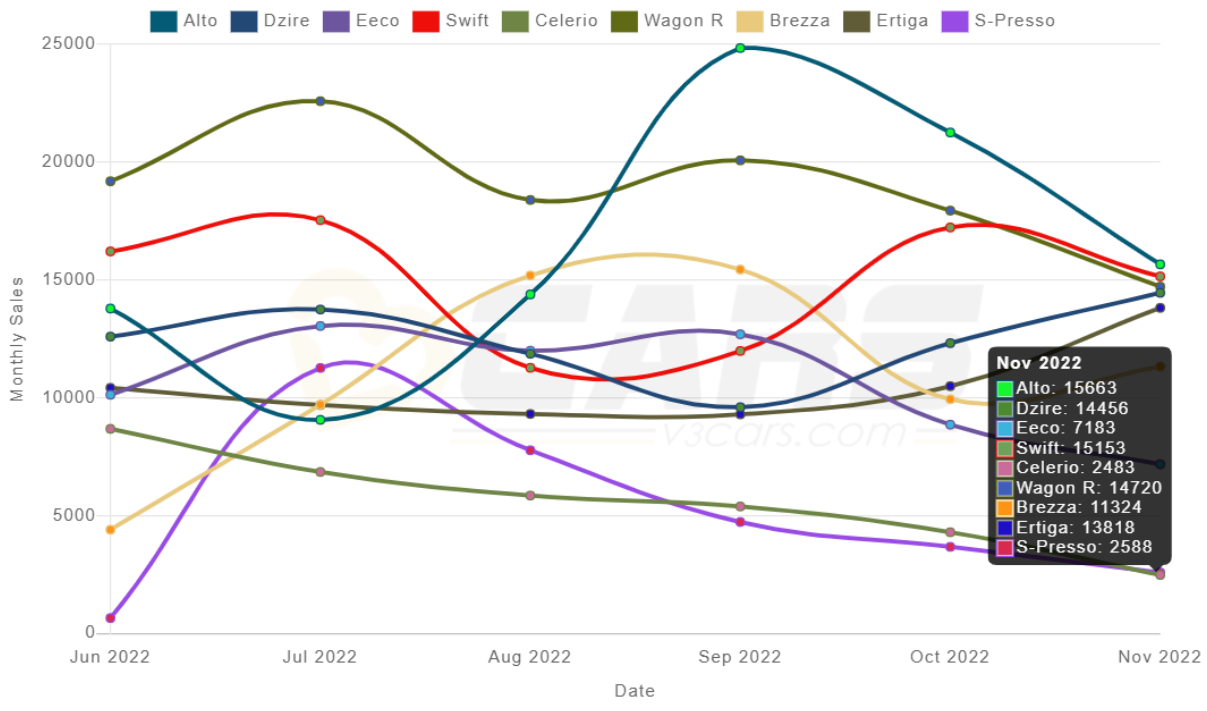
Mahindra and Mahindra

One of India's largest private corporations, Mahindra and Mahindra (M&M), has dominated the auto sector for many years. M&M, a company that specialises in farm equipment, is the third-largest tractor producer in the world. It has two key operating divisions that together produce more than 100,000 tractors annually. M&M currently runs six facilities in India. With a production capacity of 200,000 vehicles per year, the Nashik facility produces five different types of automobiles, including the popular models Scorpio and Xylo.



Maruti Suzuki

Indian automaker Maruti Suzuki India Limited has its headquarters in New Delhi. When it was established in 1981, the Indian government held it until 2003, when Suzuki Motor Corporation of Japan purchased it. Maruti Suzuki has a 44.2% market share in the Indian passenger car industry as of February 2022. In India, Maruti Suzuki has two factories. The annual output capacity of all manufacturing facilities is 1,200,000 automobiles. The 300-acre Gurgaon manufacturing park features three completely integrated production facilities. Additionally, 240,000 K-Series engines are produced there each year.



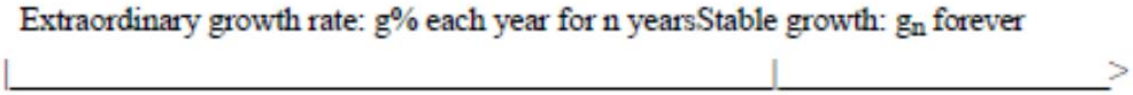
Two-Stage DDM

The two-stage dividend discount model is used to find the value of the company based on its dividend payout and growth in revenue. The rationale for the model lies in the present value rule - the value of any asset is the present value of expected future cash flows discounted at a rate appropriate to the riskiness of the cash flows.

There are two basic inputs to the model – (1) expected dividends and (2) cost on equity. To obtain the expected dividends, assume about expected future growth rates in earnings and payout ratios The required rate of return on a stock (Ke) is determined by its riskiness of the business. Historical data of the company is analysed to figure out the future expected growth rate and the future dividend payment.

In the Two-stage model of DDM, a company has two phases of growth. A high growth period with low dividend payout ratio and shorter duration. This phase if followed by a stable growth period with a high dividend payout ratio which is maintained for a very long time.

The present value of the dividends during high growth period is found. Then the terminal value of the company is found with the assumption that the growth rate will be constant. The present of this terminal value is then added to the sum of dividends to obtain the value of the firm.



Value of the Stock = PV of Dividends during extraordinary phase + PV of terminal price

$$P_0 = \sum_{t=1}^{t=n} \frac{DPS_t}{(1+k_{c,hg})^t} + \frac{P_n}{(1+k_{c,hg})^n} \text{ where } P_n = \frac{DPS_{n+1}}{(k_{c,st} - g_n)}$$

Mahindra and Mahindra

		Mahindra 2-Stage DDM						
S.NO.		2022	2023	2024	2025	2026	2027	2028
1	EPS	41.28	45.0438	49.15077	53.63221	58.52225	63.85815	67.68964
2	Payout Ratio	27.98%	27.98%	27.98%	27.98%	27.98%	27.98%	40%
3	DPS	11.550144	12.60326	13.75239	15.00629	16.37453	17.86751	27.07586
4	ROE	12.66%	12.66%	12.66%	12.66%	12.66%	12.66%	10%
5	Retention ratio	72.02%	72.02%	72.02%	72.02%	72.02%	72.02%	60%
6	Growth rate	9.118%	9.118%	9.118%	9.118%	9.118%	9.12%	6.00%
7	Cost of Equity		7.470%	7.470%	7.470%	7.470%	7.470%	7.470%
8	Cummalative Cost of Equity		1.0747	1.1550	1.2413	1.3340	1.4336	
9	PV of Dividends		11.72723	11.90703	12.08959	12.27495	12.46315	
	Sum of Dividends			60.46196				
	Terminal Value			1841.895				
	PV of TV			1284.78				
	Total value per share			1345.242				

1. Based on past data, Mahindra is expected to grow by 9.118% each year for the next 5 years
2. It is also expected to maintain the current retention ratio and ROE for the next 5 years
3. After 5 years the company will attain stable growth of 6% till perpetuity
4. After 5 years, the ROE will drop to 10%

Price per share = Rs. 1345.242

Maruti Suzuki

		Maruti Suzuki 2-Stage DDM						
S.NO.		2022	2023	2024	2025	2026	2027	2028
1	EPS	128.43	134.1427	140.1096	146.3419	152.8513	159.6504	164.44
2	Payout Ratio	36.09%	36.09%	36.09%	36.09%	36.09%	36.09%	40%
3	DPS	46.350387	48.41212	50.56555	52.81478	55.16405	57.61782	65.776
4	ROE	6.96%	6.96%	6.96%	6.96%	6.96%	6.96%	5%
5	Retention ratio	63.91%	63.91%	63.91%	63.91%	63.91%	63.91%	60.0%
6	Growth rate	4.45%	4.45%	4.45%	4.45%	4.45%	4.45%	3%
7	Cost of Equity		9.50%	9.50%	9.50%	9.50%	9.50%	9.50%
8	Cummalative Cost of Equity		1.0950	1.199025	1.312932	1.437661	1.574239	
9	PV of Dividends		44.21198	42.17222	40.22658	38.37069	36.60043	
	Sum of Dividends			201.5819				
	Terminal Value			1011.938				
	PV of TV			642.8109				
	Total value per share			844.3928				

1. Based on past data, Maruti-Suzuki is expected to grow by 4.55% each year for the next 5 years
2. It is also expected to maintain the current retention ratio and ROE for the next 5 years
3. After 5 years the company will attain stable growth of 3% till perpetuity
4. After 5 years, the ROE will drop to 5%

Price per share = Rs. 844.3928

***** TATA Motors does not dividends and hence DDM method cannot be used for it*****

FCFE Method

FCFE method or Free cash flow to equity method is used to find the value of the company based on its free cash flow. The underlying principle is that there will be no future cash buildup in the firm, since the cash that is available after debt payments and reinvestments needs is paid out to stockholders each period The FCFE is a measure of what a firm can afford to pay out as dividends. Dividends paid are different from the FCFE. The value of equity, under the constant growth model, is a function of the expected FCFE in the next period, the stable growth rate and the required rate of return.

This model is most suitable when:

1. The firm is in steady state.
2. Capital expenditure is not significantly greater than depreciation.
3. The beta of the stock is close to one or below one.
4. The firm has FCFE which are significantly different from dividends, or dividends are not relevant.
5. The leverage is stable.

The free cash flow to the equity is evaluated and is discounted by an appropriate rate to find its present value. The terminal value of the firm is found by using expected future cash flow and using perpetuity formula. The present value of this terminal value is added to get the value o the firm.

Expected Growth Rate = Retention Ratio * ROE

Equity Reinvestment Rate = (Net Capex + Change in WC) – [New Debt Issue – Repayments] / Non Cash Net Income

FCFE = Net Income - [Net Capex * (1-Debt Ratio)] - [Change in noncash WC (1-Debt Ratio)]. **This is the case of constant debt usage.**

If usage of debt is not constant then
FCFE = Net Income - [Net Capex] - [Change in noncash WC] + [Debt Repaid - New Debt Issued]

TATA Motors 3-stage FCFE

TATA Motors FCFE stage 3

	High Growth phase						
S.No.		2022	2023	2024	2025	2026	2027
1	Net Income	-84,286.5	-90161.269	-96445.5	-103168	-110359	-118051
2	CAPEX	142,220.0	152132.73	162736	174079	186212	199191
3	Depreciation	2,334.46	2497.1719	2671.22	2857.41	3056.57	3269.61
4	Change in WC	-273.9	-292.99083	-313.412	-335.257	-358.625	-383.621
5	ROE	6.97%	6.97%	6.97%	6.97%	6.97%	6.97%
6	Retention Ratio	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
7	Growth Rate	6.970%	6.970%	6.970%	6.970%	6.970%	6.970%
8	Debt Ratio	1.17	1.17	1.17	1.17	1.17	1.17
9	FCFE	-60552.521	-64773.032	-69287.7	-74117.1	-79283	-84809.1
10	Cost of Equity		11.640%	11.640%	11.640%	11.640%	11.640%
11	PV of FCFE		54239.091	51970.2	49796.3	47713.2	45717.4

	Transition phase				
S.No.		2028	2029	2030	2031
1	Net Income	-125109.97	-131352.96	-136607	-142071
2	CAPEX	211103.079	221637.12	230503	239723
3	Depreciation	3465.13637	3638.0467	3783.57	3934.91
4	Change in WC	-406.5612	-426.8486	-443.923	-461.679
5	ROE	6.64670%	6.3234%	6.00%	6.000%
6	Retention Ratio	89.9695%	78.9132%	66.666%	66.667%
7	Growth Rate	5.9800%	4.9900%	4.0000%	4.0000%
8	Debt Ratio	1.17	1.17	1.17	1.17
9	FCFE	-89880.633	-94365.677	-98140.3	-102066
10	Cost of Equity	11.640%	11.640%	11.640%	11.640%
11	PV of FCFE	84808.9357	89880.517	75713.7	70532.3

Sum of High Growth PV	249436.17
Sum of Transition Growth PV	250403.14
Terminal Value	102065.92
PV of TV	42298.2
Total Value	542137.5

All values are in Crores

1. Based on historical data, Maruti Suzuki is expected to grow at 4.44% for the next 5 years.
2. Capex, depreciation and change in WC will also grow at the same rate.
3. The company will maintain its ROE and retention ratio for the high growth period.
4. After the 5 years the growth will slow down to 4% and ROE will become 6%
5. There will be stable growth from 2031 onwards

Value of company – Rs. 542137.5 crores

Mahindra 3-stage FCFE

			Mahindra FCFE stage 3				
	High Growth phase						
S.No.		2022	2023	2024	2025	2026	2027
1	Net Income	5,315.46	5800.1094	6328.95	6906	7535.68	8222.76
2	CAPEX	60,398.00	65904.9278	71914	78470.9	85625.6	93432.8
3	Depreciation	3,502.60	3821.95768	4170.43	4550.68	4965.6	5418.35
4	Change in WC	188.5	205.686925	224.441	244.905	267.235	291.6
5	ROE	12.66%	12.66%	12.66%	12.66%	12.66%	12.66%
6	Retention Ratio	72.02%	72.02%	72.02%	72.02%	72.02%	72.02%
7	Growth Rate	9.118%	9.118%	9.118%	9.118%	9.118%	9.118%
8	Debt Ratio	0.17	0.17	0.17	0.17	0.17	0.17
9	FCFE	-42064.177	-45899.476	-50084.5	-54651	-59634	-65071.2
10	Cost of Equity		7.470%	7.470%	7.470%	7.470%	7.470%
11	PV of FCFE		39140.3899	39740.5	40349.8	40968.4	41596.6
	Transition phase						
S.No.		2028	2029	2030	2031		
1	Net Income	8881.200275	9500.07987	10070.1	10674.3		
2	CAPEX	100914.4522	107946.598	114424	121289		
3	Depreciation	5852.22955	6260.03766	6635.66	7033.8		
4	Change in WC	314.9503997	336.897476	357.112	378.539		
5	ROE	11.773400%	10.8868%	10.000%	10%		
6	Retention Ratio	68.0140%	64.008%	60.00%	60%		
7	Growth Rate	8.01%	6.97%	6.00%	6.00%		
8	Debt Ratio	0.17	0.17	0.17	0.17		
9	FCFE	-70281.85337	-75179.39	-79690.3	-84471.8		
10	Cost of Equity	7.470%	13.28%	13.28%	13.28%		
11	PV of FCFE	65071.16031	70281.7206	58585.8	54820.9		
	Sum of High Growth PV		201795.676				
	Sum of Transition Growth PV		193938.675				
	Terminal Value		84471.77		All values are in Crores		
	PV of TV		47469.38				
	Total Value		443203.74				

1. Based on historical data, Maruti Suzuki is expected to grow at 4.44% for the next 5 years.
2. Capex, depreciation and change in WC will also grow at the same rate.
3. The company will maintain its ROE and retention ratio for the high growth period.
4. After the 5 years the growth will slow down to 3% and ROE will become 5%
5. There will be stable growth from 2031 onwards

Value of company – 443203.74 crores

Maruti Suzuki 3-stage FCFE

Mahindra FCFE stage 3

	High Growth phase						
S.No.		2022	2023	2024	2025	2026	2027
1	Net Income	5,315.46	5800.1094	6328.95	6906	7535.68	8222.76
2	CAPEX	60,398.00	65904.9278	71914	78470.9	85625.6	93432.8
3	Depreciation	3,502.60	3821.95768	4170.43	4550.68	4965.6	5418.35
4	Change in WC	188.5	205.686925	224.441	244.905	267.235	291.6
5	ROE	12.66%	12.66%	12.66%	12.66%	12.66%	12.66%
6	Retention Ratio	72.02%	72.02%	72.02%	72.02%	72.02%	72.02%
7	Growth Rate	9.118%	9.118%	9.118%	9.118%	9.118%	9.118%
8	Debt Ratio	0.17	0.17	0.17	0.17	0.17	0.17
9	FCFE	-42064.177	-45899.476	-50084.5	-54651	-59634	-65071.2
10	Cost of Equity		7.470%	7.470%	7.470%	7.470%	7.470%
11	PV of FCFE		39140.3899	39740.5	40349.8	40968.4	41596.6
	Transition phase						
S.No.		2028	2029	2030	2031		
1	Net Income	8881.200275	9500.07987	10070.1	10674.3		
2	CAPEX	100914.4522	107946.598	114424	121289		
3	Depreciation	5852.22955	6260.03766	6635.66	7033.8		
4	Change in WC	314.9503997	336.897476	357.112	378.539		
5	ROE	11.773400%	10.8868%	10.000%	10%		
6	Retention Ratio	68.0140%	64.008%	60.00%	60%		
7	Growth Rate	8.01%	6.97%	6.00%	6.00%		
8	Debt Ratio	0.17	0.17	0.17	0.17		
9	FCFE	-70281.85337	-75179.39	-79690.3	-84471.8		
10	Cost of Equity	7.470%	13.28%	13.28%	13.28%		
11	PV of FCFE	65071.16031	70281.7206	58585.8	54820.9		
	Sum of High Growth PV		201795.676				
	Sum of Transition Growth PV		193938.675				
	Terminal Value		84471.77		All values are in Crores		
	PV of TV		47469.38				
	Total Value		443203.74				

1. Based on historical data, Maruti Suzuki is expected to grow at 4.44% for the next 5 years.
2. Capex, depreciation and change in WC will also grow at the same rate.
3. The company will maintain its ROE and retention ratio for the high growth period.
4. After the 5 years the growth will slow down to 3% and ROE will become 5%
5. There will be stable growth from 2031 onwards

Value of company – Rs. 443203.74 crores

TATA MOTORS 2 STAGE FCFE

TATA MOTORS FCFE

S.No.		2022	2023	2024	2025	2026	2027	2028
1	Net Income	-84,286.50	-90161.3	-96445.5	-103168	-110359	-118051	-122773
2	CAPEX	1,42,220.00	152132.7	162736.4	174079.1	186212.4	199191.4	207159.1
3	Depreciation	2,334.46	2497.172	2671.225	2857.409	3056.571	3269.613	3497.506
4	Change in WC	-273.9	-292.991	-313.412	-335.257	-358.625	-383.621	-398.966
5	ROE	6.97%	6.97%	6.97%	6.97%	6.97%	6.97%	6.00%
6	Retention Ratio	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	66.67%
7	Growth Rate	6.970%	6.970%	6.970%	6.970%	6.970%	6.970%	4.000%
8	Debt Ratio	1.17	1.17	1.17	1.17	1.17	1.17	1.17
9	FCFE	-60552.521	-64773	-69287.7	-74117.1	-79283	-84809.1	
10	Cost of Equity		11.640%	11.640%	11.640%	11.640%	11.640%	11.640%
11	PV of FCFE		54239.09	51970.22	49796.26	47713.24	45717.35	
	Sum of PV		249436.2					
	Terminal Value		1154685		All values are in Crores			
	PV of TV		665831.5					
	Total Value		915267.7					

1. Based on historical data, TATA MOTORS is expected to grow at 6.97% for the next 5 years.
2. Capex, depreciation and change in WC will also grow at the same rate.
3. The company will maintain its ROE and retention ratio for the high growth period.
4. After the 5 years the growth will slow down to 4% and ROE will become 6%
5. As the payout is 0, therefore the company won't be paying any dividends

Total value of company = RS. 915267.7 Crores

MAHINDRA 2 STAGE FCFE

				MAHINDRA FCFE					
S.No.		2022	2023	2024	2025	2026	2027	2028	
1	Net Income	5,315.46	5800.109397	6328.948	6906.004	7535.675	8222.758	8716.123	
2	CAPEX	60,398.00	65904.92777	71913.96	78470.88	85625.65	93432.77	99038.73	
3	Depreciation	3,502.60	3821.957681	4170.434	4550.682	4965.602	5418.352	5743.453	
4	Change in WC	188.5	205.6869248	224.4409	244.9048	267.2346	291.6003	309.0963	
5	ROE	12.66%	12.66%	12.66%	12.66%	12.66%	12.66%	10%	
6	Retention Ratio	72.02%	72.02%	72.02%	72.02%	72.02%	72.02%	60.00%	
7	Growth Rate	9.118%	9.118%	9.118%	9.118%	9.118%	9.118%	6.000%	
8	Debt Ratio	0.17	0.17	0.17	0.17	0.17	0.17	0.17	
9	FCFE	-42064.2	-45899.4759	-50084.5	-54651	-59634	-65071.2		
10	Cost of Equity		7.470%	7.470%	7.470%	7.470%	7.470%	7.470%	
11	PV of FCFE		39140.38988	39740.49	40349.79	40968.44	41596.57		
	Sum of PV		201795.6762						
	Terminal Value		4692211.504		All values are in Crores				
	PV of TV		3272964.807						
	Total Value		3474760.484						

1. Based on historical data, Mahindra is expected to grow at 9.118% for the next 5 years.
2. Capex, depreciation and change in WC will also grow at the same rate.
3. The company will maintain its ROE and retention ratio for the high growth period.
4. After the 5 years the growth will slow down to 6% and ROE will become 10%

Total value of the company = Rs. 3474760.484 crores

MARUTI SUZUKI 2 STAGE FCFE

			Maruti Suzuki FCFE					
S.No.		2022	2023	2024	2025	2026	2027	2028
1	Net Income	3,766.30	3933.83015	4108.81226	4291.57782	4482.473036	4681.859533	4822.3153
2	CAPEX	82,686.30	86364.2991	90205.9006	94218.3817	98409.34345	102786.7249	105870.33
3	Depreciation	2,786.50	2910.44731	3039.90796	3175.1272	3316.361181	3463.877437	3567.7938
4	Change in WC	680.4	710.665117	742.276468	775.293935	809.7800637	845.8001822	871.17419
5	ROE	6.96%	6.96%	6.96%	6.96%	6.96%	6.96%	5%
6	Retention Ratio	63.91%	63.91%	63.91%	63.91%	63.91%	63.91%	60.00%
7	Growth Rate	4.45%	4.45%	4.45%	4.45%	4.45%	4.45%	3%
8	Debt Ratio	0.01	0.01	0.01	0.01	0.01	0.01	0.01
9	FCFE	-76008.098	-79389.042	-82920.374	-86608.785	-90461.2617	-94485.1016	
10	Cost of Equity		13.28%	13.28%	13.28%	13.28%	13.28%	13.28%
11	PV of FCFE		76007.9652	61866.2907	57042.8915	52595.54811	48494.9414	
	Sum of PV		296007.637					
	Terminal Value		946689.248		All values are in Crores			
	PV of TV		507506.07					
	Total Value		803513.709					

1. Based on historical data, Maruti Suzuki is expected to grow at 4.44% for the next 5 years.
2. Capex, depreciation and change in WC will also grow at the same rate.
3. The company will maintain its ROE and retention ratio for the high growth period.
4. After the 5 years the growth will slow down to 3% and ROE will become 5%

Total value of the company = Rs. 8083513.709 crores

Three-Stage DDM

The two-stage dividend model had a limitation that the growth rate changed from very high to low overnight. This limitation is corrected in the three-stage dividend discount model which has three phases: a high growth phase where dividend payout is low, a transition phase where the growth reduces slowly and the payout ratio increases and a stable growth phase where the growth is constant till perpetuity.

This method works best for firm which has changing growth over time and change in other dimensions like payout policies and risk. It is used for firms with extraordinary growth rate which they are expected to maintain for an initial period after which the differential advantage is expected to deplete leading to gradual decline to stable growth rate.

The same principal of finding the present value of future cash flows is used in this model. The present value of the transition phase dividend is found by discounting it by an appropriate rate. The present value of the terminal value is added to the present value of dividends of high growth and transition phase to obtain the value of the firm.

Mahindra and Mahindra

		Mahindra 3-Stage DDM					
	High growth Phase						
S.NO.		2022	2023	2024	2025	2026	2027
1	EPS	41.28	45.04379977	49.15077272	53.63221	58.52225	63.85815
2	Payout Ratio	27.98%	27.98%	27.98%	27.98%	27.98%	27.98%
3	DPS	11.550144	12.60325518	13.75238621	15.00629	16.37453	17.86751
4	ROE	12.66%	12.66%	12.66%	12.66%	12.66%	12.66%
5	Retention ratio	72.02%	72.02%	72.02%	72.02%	72.02%	72.02%
6	Growth rate	9.118%	9.118%	9.118%	9.118%	9.118%	9.118%
7	Cost of Equity		7.470%	7.470%	7.470%	7.470%	7.470%
8	Cummalative Cost of Equity		1.0747	1.1550	1.2413	1.3340	1.4336
9	PV of Dividends		11.72723102	11.90703314	12.08959	12.27495	12.46315
	Sum of Dividends			60.46195556			
	Transition Phase						
S.NO.		2028	2029	2030	2031		
1	EPS	69.01688868	73.87507858	78.30745918	83.00591		
2	Payout Ratio	31.9860%	35.9920%	39.9986%	40.0000%		
3	DPS	22.07574201	26.58911828	31.32188737	33.20236		
4	ROE	11.773400%	10.8868%	10.000%	10%		
5	Retention ratio	68.0140%	64.008%	60.00%	60%		
6	Growth rate	8.07843200%	7.03913200%	6.00%	6%		
7	Cost of Equity	7.470%	7.470%	7.470%	7.470%		
8	Cummalative Cost of Equity	1.540719195	1.655810919	1.779499995			
9	PV of Dividends	14.328206	16.05806435	17.60151024			
	Sum of Dividends		47.98778058				
	Terminal Value		2258.664129				
	PV of TV		1269.268972				
	Total Value per share		1377.718708				

1. After 5 years of high growth, the growth rate will decrease to 6% over 3 years.
2. The ROE will decrease to 10% over 3 years.
3. The retention ratio will decrease to 60% in 3 years' time.

Price per share = Rs. 1377.718

Maruti Suzuki

		Maruti Suzuki 3-Stage DDM					
	High Growth Phase						
S.NO.		2022	2023	2024	2025	2026	2027
1	EPS	128.43	134.1427411	140.1096	146.3419	152.8513	159.6504
2	Payout Ratio	36.09%	36.09%	36.09%	36.09%	36.09%	36.09%
3	DPS	46.35039	48.41211525	50.56555	52.81478	55.16405	57.61782
4	ROE	6.96%	6.96%	6.96%	6.96%	6.96%	6.96%
5	Retention ratio	63.91%	63.91%	63.91%	63.91%	63.91%	63.91%
6	Growth rate	4.45%	4.45%	4.45%	4.45%	4.45%	4.45%
7	Cost of Equity		9.50%	9.50%	9.50%	9.50%	9.50%
8	Cummalative Cost of Equity		1.0950	1.199025	1.312932	1.437661	1.574239
9	PV of Dividends		44.2119774	42.17222	40.22658	38.37069	36.60043
	Sum of Dividends			201.5819			
	Transition phase						
S.NO.		2028	2029	2030	2031		
1	EPS	165.9832	171.7649405	176.9179	182.2254		
2	Payout Ratio	37.39%	38.70%	40.00%	40%		
3	DPS	62.06664	66.46729504	70.76715	72.89018		
4	ROE	6.31%	5.6533400%	5.0000%	5%		
5	Retention ratio	62.61%	61.3033400%	60.0000%	60.00%		
6	Growth rate	3.97%	3.4833%	3.000%	3.00%		
7	Cost of Equity	9.50%	9.50%	9.50%	9.50%		
8	Cummalative Cost of Equity	1.783298	2.020119573	2.288391			
9	PV of Dividends	34.80442	32.90265385	30.92441			
	Sum of Dividends		98.63147982				
	Terminal value		1121.38731				
	PV of TV		490.0329917				
	Total Value per share		790.2463808				

1. After high growth of 5 years, growth rate will decrease to 3% in 3 years.
2. ROE will decrease linearly to 5% in 3 years.
3. The retention ratio will also decrease to 60% in 3 years

Price per share = Rs. 790.246

FCFF Method

Free cash flow to firm method is used to estimate the value of firm by using the free cash flow. FCFF, or Free Cash Flow to Firm, is the cash flow available to all funding providers (debt holders, preferred stockholders, common stockholders, convertible bond investors, etc.). This can also be referred to as unlevered free cash flow, and it represents the surplus cash flow available to a business if it was debt-free. A common starting point for calculating it is Net Operating Profit After Tax (NOPAT), which can be obtained by multiplying Earnings Before Interest and Taxes (EBIT) by (1-Tax Rate). From that, we remove all non-cash expenses and remove the effect of CapEx and changes in Net Working Capital, as the core operations are the focus. To arrive at the FCFF figure, a Financial Analyst will have to undo the work that the accountants have done. The objective is to get the true cash inflows and outflows of the business.

Reinvestment rate= (net capex + change in working capital)/EBIT(1-t) =0.276

Free cash flow to the firm =
EBIT*(1-t)* (1-reinvestment rate)

TATA Motors

TATA Motors FCFF

S.No.		2022	2023	2024	2025	2026	2027	2028
1	CAPEX	142,220.0	152,132.7	162,736.4	174,079.1	186,212.4	199,191.4	207,159.1
2	Depreciation	2,334.46	2497.172	2671.225	2857.409	3056.571	3269.613	3400.398
3	Net CAPEX	139,885.5	149,635.6	160,065.2	171,221.7	183,155.9	195,921.8	203,758.7
4	Change in WC	-273.9	-292.99	-313.41	-335.26	-358.62	-383.62	-398.97
5	EBIT	3982.7	3982.7	3982.7	3982.7	3982.7	3982.7	3982.7
6	Tax Rate	4.59%	4.59%	4.59%	4.59%	4.59%	4.59%	4.59%
7	EBIT(1-T)	3799.73	3799.73	3799.73	3799.73	3799.73	3799.73	3799.73
8	Reinvestment rate	36.7	39.3	42.0	45.0	48.1	51.5	53.5
9	Growth	6.970%	6.970%	6.970%	6.970%	6.970%	6.970%	4%
10	FCFF	240361.4	230630.5	220221.3	209086.6	197175.8	184434.9	
11	Cost of Equity		11.64%	11.64%	11.64%	11.64%	11.64%	11.64%
12	PV of FCFF		240361.6	185044.9	158270.5	134600.6	113698.5	
	Sum of PV		831976					
	Terminal Value		2311693		All values are in Crores			
	PV of TV		1333003					
	Total Value		2164979					

1. Capex, and change in WC will also grow at the same rate.
2. After the 5 years the growth will slow down to 4%

Value of firm = Rs. 2164979 crores

Mahindra and Mahindra

Mahindra FCFF

S.No.		2022	2023	2024	2025	2026	2027	2028
1	CAPEX	60,398.00	65,905.09	71,914.32	78,471.46	85,626.49	93,433.91	99,039.95
2	Depreciation	3,502.60	3821.967	4170.454	4550.716	4965.65	5418.418	5743.523
3	Net CAPEX	56,895.40	62,083.12	67,743.86	73,920.75	80,660.84	88,015.50	93,296.43
4	Change in WC	188.5	205.69	224.44	244.91	267.24	291.60	309.10
5	EBIT	6671.3	6671.3	6671.3	6671.3	6671.3	6671.3	6671.3
6	Tax Rate	20.17%	20.17%	20.17%	20.17%	20.17%	20.17%	20.17%
7	EBIT(1-T)	5325.70	5325.70	5325.70	5325.70	5325.70	5325.70	5325.70
8	Reinvestment r	10.7	11.7	12.8	13.9	15.2	16.6	17.6
9	Growth	9.12%	9.12%	9.12%	9.12%	9.12%	9.12%	6%
10	FCFF	475485.979	470281.1	464601.6	458404.2	451641.8	444262.8	
11	Cost of Equity		7.47%	7.47%	7.47%	7.47%	7.47%	7.47%
12	PV of FCFF		475486.1	407176.8	374299.2	343636.8	315034.3	
	Sum of PV		1915633					
	Terminal Value		29861521		All values are in Crores			
	PV of TV		20829348					
	Total Value		22744981					

1. Capex, and change in WC will also grow at the same rate.
2. After the 5 years the growth will slow down to 6%

Value of company = Rs. 22744981 crores

Maruti Suzuki

			Maruti Suzuki FCFF					
S.No.		2022	2023	2024	2025	2026	2027	2028
1	CAPEX	82,686.30	86,365.84	90,209.12	94,223.43	98,416.37	102,795.90	105,879.77
2	Depreciation	2,786.50	2910.49925	3040.016	3175.297	3316.598	3464.18653	3568.11213
3	Net CAPEX	79,899.80	83,455.34	87,169.10	91,048.13	95,099.77	99,331.71	102,311.66
4	Change in WC	680.4	710.68	742.30	775.34	809.84	845.88	871.25
5	EBIT	5701.2	5701.2	5701.2	5701.2	5701.2	5701.2	5701.2
6	Tax Rate	33.94%	33.94%	33.94%	33.94%	33.94%	33.94%	33.94%
7	EBIT(1-T)	3766.327	3766.327	3766.327	3766.327	3766.327	3766.327	3766.327
8	Reinvestment rate	21.4	22.3	23.3	24.4	25.5	26.6	27.4
9	Growth	4.45%	4.45%	4.45%	4.45%	4.45%	4.45%	3%
10	FCFF	296052.474	292466.656	288721.3	284809.2	280723.1	276455.088	
11	Cost of Equity		13.28%	13.28%	13.28%	13.28%	13.28%	13.28%
12	PV of FCFF		296052.607	227913.4	198618.2	172958.2	150491.474	
	Sum of PV		1046033.86					
	Terminal Value		2660017.13		All values are in Crores			
	PV of TV		1425995.75					
	Total Value		2472029.61					

1. Capex, and change in WC will also grow at the same rate.
2. After the 5 years the growth will slow down to 3%

Value of Company = Rs. 247209.61 crores

Conclusion

The valuation of the companies was done using 2-stage and 3-stage DDM as well as FCFF and FCFE methods. The methods yielded different results from each other. This is because the basic principal and assumptions of the models is different. Also the dividends paid by the companies are less than the FCFE because they retain their earnings for reinvestment.

After analysing historical data, it was clear that the growth of the companies was hit hard by the covid pandemic. However the automobile sector has almost recovered from the crisis and is back to its normal growth with the sales returning to pre-covid numbers.

Companies with high growth sometimes had lower values because their high cost of equity which nullified their growth.

The price per share obtained from these valuation are slightly different from actual prices. This is because of assumptions in growth are different for each business analyst.