Equity Valuation
Final Group Report

Members:
Yukki Qiu, Jasmyn Zhang, Justina Jin
Jingjing Wang, Jiayi Wu, Kasi Xu, Yi Shen

Company	Current Price	DCF Value	Pricing	Recommendation
Hermès (RMS:PA)	€1993.80	€1114.27	€1104.05	HOLD
MGM Resort (NYSE:MGM)	$43.14	$55.15	$35.24	BUY
Dollar Tree (NASDAQ:DLTR)	$155.47	$140.47	$141.04	SELL
Coca-Cola (NYSE:KO)	$64.02	$50.55	$50.06	HOLD
Walmart (NYSE:WMT)	$151.77	$155.25	$270.66	BUY
PinDuoDuo (NASDAQ:PDD)	$63.06	$67.00	$19.02	BUY
NIO (NYSE:NIO)	$8.15	$7.29	$19.66	BUY

Hermès International S.A. (RMS:PA)

Price as of May 5, 2023 Close: €1993.80

Company Overview: Founded in 1837, Hermès International S.A. is a European manufacturer and retailer of luxury products, including leather goods, ready-to-wear garments for men and women, jewelry, furniture, and cosmetics and fragrances. The company manufactures all of its products through a completely vertically integrated supply chain, and sells its products through a network of specialized stores worldwide.

Intrinsic Valuation

Lonely on the Himalayas - Unshakable Position as Top Luxury Brand, but Destined to Stay Niche

Hermès has held on tight to its crown as the most sought-after luxury brand, even as competition escalates at exponential speeds in the luxury market. Top spenders' fervor for Hermès products has not seemed to cool in the slightest as the brand has continued to hike prices with increasing magnitude and frequency in the past few years—3% per annum from 2019-2021, 4% in 2022, and already a 7% increase in the first month of 2023, with prices projected to increase up to 10% overall during the year. Compared to more mass-market players in the general apparel industry, Hermès has a lower sales-to-capital ratio, since its commitment to handcrafting most items mandates more capital investments. Since Hermès already sells at the most expensive tier, with its most sought-after handbags commanding up to $250,000 USD (in addition to the exorbitant minimum spends that customers must rack up to get on the Birkin waiting lists), its addressable market will solidify as the HNWI market as it continues to increase prices, pricing out sub-HNW consumers. Although management has noted the increasingly richer middle classes in the US and China—who have begun buying entry-level products at Hermès— as potential sources of growth, Hermès's future revenues sources will be increasingly concentrated in its core HNW regulars. But there is much room for growth still, driven by strong performance in the Chinese and American markets. Hermès's current problem, in fact, is that its leather goods production cannot catch up to demand. Thus, reinvestment rates may increase in the short run, as the brand sets out to increase its workforce, build a new leather goods facility in Ardennes, and further vertically integrate its jewellery and perfume segments this year. This vertical integration is a key sustainable competitive advantage—Hermès's commitment to handcrafting products in France ensures that its products remain inherently exclusive and helps rationalizes its higher prices in consumers' heads, cementing its grip on the highest tier of luxury consumers.

The Assumptions

	Base year	*Next year*	*Years 2-5*	*Years 6-10*	*After year 10*	*Link to story*
Revenues (a)	$11,602.00	23.0%	15.00%		2.24%	Higher growth in 2023 driven by larger magnitude of price increase (10% for 2023, returning to historical norm of 3-4% afterwards) in combination with increases of 7% per year in sales volume as production capacity expands. The expansion of Hermès's beauty and fragrances segment (which can benefit more from economies of scale and is less subject to bottlenecks) will also drive growth.
Operating margin (b)	42.49%	40.0%			45.00%	Decrease over next year since firm plans to increase workforce and increase vertical integration in perfume and jewellery segments. Overall stable margins— price and cost increases move hand in hand.
Tax rate	28.20%		28.20%		28.20%	Effective tax rate since permanent cause (ie. Foreign income).
Reinvestment (c)		1.50	1.60	1.70	8.95%	Sales-to-Capital ratio improves with a larger share of revenues coming from perfumes and beauty segments, which are relatively less capital-intensive and enjoy higher economies of scale.
Return on capital	47.01%	Marginal ROIC =	75.97%		25.00%	High margins and strong competitive edge that will not fade with time (since perception of prestige for luxury increases with length of history).
Cost of capital (d)			8.32%		8.24%	Current COC one of the lowest in the luxury sector (demand well-protected by its years-long waitlists even in the face economic instabilities that affect HNW consumers); in the long-term, cost of capital close to median company.

The Cash Flows

	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$14,270.46	40.00%	$5,708.18	$4,098.48	$1,778.97	$2,319.50
2	$16,411.03	41.00%	$6,728.52	$4,831.08	$1,337.86	$3,493.22
3	$18,872.68	41.50%	$7,832.16	$5,623.49	$1,538.53	$4,084.96
4	$21,703.59	42.00%	$9,115.51	$6,544.93	$1,769.31	$4,775.62
5	$24,959.12	42.50%	$10,607.63	$7,616.28	$1,915.02	$5,701.25
6	$28,067.78	44.00%	$12,348.50	$8,866.22	$1,828.62	$7,037.60
7	$30,849.30	44.25%	$13,649.73	$9,800.50	$1,636.19	$8,164.32
8	$33,121.35	44.50%	$14,738.22	$10,582.04	$1,336.50	$9,245.54
9	$34,717.80	44.75%	$15,535.81	$11,154.71	$939.09	$10,215.62
10	$35,507.63	45.00%	$15,978.43	$11,472.52	$464.61	$11,007.91
Terminal year	$36,315.43	45.00%	$16,341.94	$11,733.51	$1,067.75	$10,665.77

The Value

Terminal value	$161,586.34		
PV(Terminal value)	$72,584.76		
PV (CF over next 10 years)	$39,397.02		
Value of operating assets =	$111,981.78		
Adjustment for distress	$0.00	Probability of failure =	0.00%
- Debt & Minority Interests	$3,574.13		
+ Cash & Other Non-operating assets	$9,225.00		
Value of equity	$117,632.65		
- Value of equity options	$0.00		
Number of shares	105.57		
Value per share	$1,114.27	Stock was trading at =	$1,993.80

Based on the DCF Valuation, Hermès's intrinsic value per share is **€1114.27.**

Relative Valuation

For the relative valuation portion, we screened firms with the following criteria:

- Same industry as Hermès (Apparel, Accessories & Luxury Goods);
- Positive EBIT margins (firms with similarly established businesses generating positive operating income);
- Interest coverage ratio greater than or equal to 8.5 (AAA synthetic rating).

We ended up with **48 comparable firms** across Europe, Asia and North America. We chose the **Operating Margin, Expected 1-Year Revenue Growth, and Effective Tax Rate** as the independent variables and **EV/Sales** as the dependent variable for our regression analysis, since an EV/Sales-based model yielded the highest R^2.

***Pricing relative to its sector:* €1104.05 / share**	EV/Sales = 0 + 21.81 OPM + 3.88 g - 2.13 Tax Rate R^2 = 76.66% (7.38) (1.84) (-1.25) = 21.81 * (0.4249) + 3.88 * (0.23) - 2.13 * (0.282) = 9.56
***Pricing relative to the market*:* €758.01 / share**	EV/Sales = 2.32 + 2.60 g + 10.60 OPM -1.40 DFR- 3.50 Tax Rate R^2 = 30.6% (10.66) (5.49) (21.61) (4.27) (5.42) = 2.32 + 2.60(0.23) + 10.60(0.4249) - 1.40(0.0168) - 3.50(0.282) = 6.41

**Market pricing done using US market regressions, since Hermès has ADR shares*

Recommendation: HOLD

The results of our DCF valuation, our sector-based pricing regression, and our market-based pricing regression suggest that Hermès is both **overvalued** and **overpriced**—relative to both its sector and the market.

Price as of May 5, 2023	Intrinsic Value/Share	Sector-Based Price/Share	Market-Based Price/Share
€1993.80	**€1114.27**	**€1104.05**	**€758.01**

These findings would logically implicate a strong recommendation to sell—especially as Hermès is overvalued and overpriced relative to its sector by close to 100%, and overpriced relative to the market by 260%. Hermès currently trades at an EV/Sales multiple of around 17.3. Assuming its revenue growth rate in the next year is similar to our DCF prediction of 23%, that multiple of 17.3 implies an EBIT Margin of nearly 78%. This is not a figure that "makes sense" by any means, but Hermès has a long and stable track record of being the object of unbelievable irrationality.

Take its most famous products—the Birkin, Kelly, and Constance bags—for example. In September 2022, a Himalayan Kelly bag auctioned at Sotheby's broke the record for bags auctioned in Europe by selling for €352,800. Similar bags made with the same materials in different models retail at around a mere €56,000. In the face of people willingly buying Hermès bags for 6 times their retail price (which is already presumably heavily marked up from the costs of producing said bag), it no longer seems so ridiculous to imagine that Hermès could earn an EBIT Margin of 85%. Perhaps the crazy overpricing of Hermès shares on the stock market comes from investors (irrationally) proxying the firm's pricing power off of the mind-boggling prices its products can fetch in the auction market.

We do not think the market is likely to correct its error on this particular stock anytime soon. As such, our recommendation for Hermes is to HOLD.

MGM Resorts International (NYSE:MGM)

Price as of May 5, 2023 Close: $43.14

Company Overview:

MGM Resorts International (NYSE: MGM) is a Delaware corporation incorporated in 1986 that acts mainly as a holding company and, through subsidiaries, owns and operates integrated best-in-class hotels and casinos, an extensive array of restaurants, entertainments, and retail offerings across the United States and in Macau. MGM operates its business through three reportable segments: Las Vegas Strip Resorts, Regional Operations, and MGM China. Besides integrated resorts, MGM offers sports betting and online gaming in North America and Europe through MGM's 50/50 venture, BetMGM, LLC, and subsidiary, LeoVegas AB.

The Company's competitive advantages lie in its utmost efforts to locate and operate high-quality, luxurious resorts at superior sites, offer "must-see" entertainment attractions, provide exceptional customer services, and develop distinctive loyalty programs. MGM relies on its competitive edges and well-established brand name to continuously generate more revenue, expand internationally, and maintain above-industry average margins. However, as the company matures, the growth will slow down and tie back to the GDP growth rate of the US and China.

Intrinsic Valuation

			The Assumptions			
	Base year	*Next year*	*Years 2-5*	*Years 6-10*	*After year 10*	*Link to story*
Revenues (a)	$13,127,485	25%	18%		3.45%	**Next year growth (25%):** MGM obtained a 36% growth last year as operating restrictions in the US were mostly removed. I anticipate that MGM will see tremendous opportunities for growth next year as Macau returned to profitability after the relaxation of the "dynamic zero" COVID-19 policy. According to FY22's Q4 earnings release, during FY23 Chinese New Year, hotel occupancy reached 100% and hotel customers are traveling for longer stay. Mass Gross Gaming Revenue (GGR) and the rolling volume of direct VIP segment in January 2023 was on par or even exceeded 2019 level. High Growth is driven by visitation rebound in Macau. **Year 2 growth (18%), Year 3-5 growth (8%):** as the impact of COVID-19 swept away, I expect MGM's revenue to gradually drop to and remain at pre-covid level 8%. Robust 8% growth is driven by 1) continousely growing visitations to LV & Macau; 2) well-established brand name and competitive advantage in providing luxurious resort experience that drives growth; 3) MGM has constantly engaged in acquisition of real estate/properties for the past years and is open to future acquisitions which could expand the revenue stream; 4) MGM committed to bring additional nongaming entertainment events to Macau, and is currently deploying 200 additional tables; 5) MGM is hoping to receive two new gaming license to add additional tables to existing casino floor in NY; 6) MGM is planning to expand international, and it is in the process of obtaining integrated resort license to perate in Osaka. **Year 6-10 growth (7.09%-3.45%):** As the MGM matures, g will gradually tie to projected GDP growth **Justifications:** The casino resort industry currently has a market size of $82B, with MGM obtaining **16**% of the market share. As of year 10, the overall market size is expected to grow to $150B. Based on my projection, MGM is expecting to control roughly **21.7**% of the market share, which seems attainable given MGM's dedication in reinvestment and online & international expansion.
Operating margin (b)	23.35%	24%			26.50%	**Year 1-10 growth (23.35% - 26.5%):** I expect MGM's opearting margin to grow for the following reasons: 1) As a well-known and well-established brand, MGM enjoys strong economics of scale and scope. 2) MGM is gradually expanding into online betting business which enjoys a better margin than traditional hotel business (mainly through cross-holdings like BetMGM and LeoVegas). 3)MGM pays significant effort in margin control and constantly adjusts its expense managements. 4)MGM reveals that the company will further increase price and skew to luxurious offerings: its average daily hotel rate (ADR) is expected to grow double digits annually which increases its margin. Currently the business model of MGM is pretty well-defined and as the company grows more into maturity, the room for margin improvement will decrease. **Justifications:** MGM's operating margin of the most recent year is 23.35%, way higher than the average margin of hotel/gaming industry. This is because a significant amount of income is generated from other non-casino/hotel opeartions that has higher margin: restaurant and dining, online betting (which requires less infrastructure, thus higher margin). MGM also engages in sales-lease-back on most of its properties, thus maintaining a better margin. Its gain from property transactions also significantly boosted its earnings.
Tax rate	17%		17%		25.00%	I expect the tax rate to grow and converge to marginal tax rate
Reinvestment (c)		0.87	0.70	0.65	34.50%	**Year 1 sales to capital ratio:** I expect the ratio to be the highest in the first year because the next year growth was mainly due to recovery from the pandemic (in other word, even without much reinvestment, MGM can still enjoy satisfying revenue growth). **Year 2-10 sales to capital ratio:** the second year ratio reflects MGM's "actual" ability to generate revenue. The ratio is generally around industry average. **Justifications:** High growth justified by high reinvestment
Return on capital	9%	Marginal ROIC =	20%		10.00%	MGM possess significant competitive advantages, and the higher return on capital over cost of capital is what explains the growth in its CFs
Cost of capital (d)			10.2%		8.89%	**Year 2-10 COC (10.17% - 8.89%):** The Cost of capital is higher in the early years because casino typically has a high portion of asset financed by debt and that MGM is expanding into new regions (like Japan). The Cost of capital will converge to median company as the it matures. **Justification:** mid-high growth, high reinvestment, high risk --> consistent"

The Cash Flows						
	Revenues	Operating Margin	EBIT	EBIT (1-t)	Reinvestment	FCFF
1	$16,409,356.25	24.00%	$3,938,245.50	$3,268,743.77	$3,772,265.80	-$503,522.04
2	$19,363,040.38	24.71%	$4,785,437.12	$3,971,912.81	$4,219,548.75	-$247,635.94
3	$20,912,083.61	25.07%	$5,242,958.10	$4,351,655.23	$2,212,918.90	$2,138,736.33
4	$22,585,050.29	25.43%	$5,743,055.65	$4,766,736.19	$2,389,952.41	$2,376,783.77
5	$24,391,854.32	25.79%	$6,289,613.86	$5,220,379.51	$2,779,698.50	$2,440,681.01
6	$26,121,236.79	26.14%	$6,828,837.62	$5,558,673.82	$2,660,588.42	$2,898,085.40
7	$27,735,529.22	26.50%	$7,349,915.24	$5,865,232.36	$2,483,526.82	$3,381,705.54
8	$29,197,191.61	26.50%	$7,737,255.78	$6,050,534.02	$2,248,711.37	$3,801,822.65
9	$30,470,189.17	26.50%	$8,074,600.13	$6,185,143.70	$1,958,457.78	$4,226,685.92
10	$31,521,410.69	26.50%	$8,353,173.83	$6,264,880.38	$1,617,263.89	$4,647,616.49
Terminal year	$32,608,899.36	26.50%	$8,641,358.33	$6,481,018.75	$2,235,951.47	$4,245,067.28

The Value		
Terminal value	$78,034,325.00	
PV(Terminal value)	$30,686,097.62	
PV (CF over next 10 years)	$12,824,255.45	
Value of operating assets =	$43,510,353.06	
Adjustment for distress	$0.00	Probability of failure = 0.00%
- Debt & Minority Interests	$29,362,222.97	
+ Cash & Other Non-operating assets	$6,757,892.90	
Value of equity	$20,906,022.99	
- Value of equity options	$0.00	
Number of shares	379,087.52	
Value per share	$55.148	Stock was trading at = $43.140

Based on the DCF Valuation, MGM's intrinsic value per share is **$55.15**

Relative Valuation

For the relative valuation portion, we screened firms with the following criteria:

- Same industry as MGM (Casinos and Gaming & Hotels and Resorts - Consumer Discretionary)
- Positive EBITDA (firms with similarly businesses segments generating positive operating income);
- Public US company with comparable Enterprise Value that operates in, but not limited to, Las Vegas

We ended up with **24 comparable firms**. We chose the **Expected 2-Year Revenue Growth** and **Effective last FY Tax Rates** as the independent variables and **EV/EBITDA** as the dependent variable for our regression analysis since it yielded the highest R^2 when regressing relative to the sector; the Casino industry was also severely impacted by the pandemic, resulting in fewer companies earning positive Net Income in the near term.

***Pricing relative to its sector:* $35.2 / share**	EV/EBITDA = 5.41 + 9.68*Tax Rate + 68.97*g R^2 = 77.98% (2.52) (1.26) (8.55) = 5.41 + 9.68*0.77 + 68.97*0.09 = 19.09
***Pricing relative to the market*: Negative* - Not Applicable (Explanation below)**	EV/EBITDA = 23.93 + 25.40 g - 8.20 DFR - 34.40 Tax Rate R^2 = 5.3% (22.07) (6.44) (3.43) (7.73) = 23.93 + 25.4(0.09) - 8.2(0.67) - 34.4(0.77) = -5.77

**Market pricing done using US market regressions as most of MGM's revenues derive from the US*

Explanation: pricing relative to the market yields negative EV/EBITDA and negative predicted Price/Share, and is thus not applicable. MGM was charged an effective tax rate of 77.1% in FY22 due to increased state taxes and 53.3% of foreign income tax (in Macau), resulting in negative EV/EBITDA. We should not normalize it because there's no indication of whether the tax rate will continue to remain high for MGM and that current market price should reflect the actual tax rate (and therefore, actual after-tax earnings) of a company. What's more, unlike other industries, the Casino Resort sector experienced tremendous and unparalleled ups and downs during and post-pandemic. Many companies including Wynn Resorts and Caesar Entertainment paid 0% or even a negative tax rate (tax benefits) due to continuous loss during COVID-19. Unlike in normal times and in other parts of the market, investors prefer stocks with lower tax rates (tax rate normally has a negative coefficient with EV/EBITDA as indicated in regression to market), higher positive tax rate for resorts indicates that the company is at least generating positive taxable income, exhibiting stronger profitability than those paying zero tax rate. Thus, when running regression against the casino resort sector, we found that the tax rate in fact has a positive coefficient with EV/EBITDA. Therefore, given that the casino & resort industry is still in the mix of turbulence resulting from the pandemic and the special situation it faces, relative valuation against the sector can better reflect a company's value.

Recommendation: BUY

The results of our DCF valuation suggest that MGM is **undervalued**. However, our sector-based pricing regression suggests that the company is **overpriced** relative to the sector. We would like to override the relative valuation and base our recommendation on the DCF valuation.

Price as of May 5, 2023	Intrinsic Value/Share	Sector-Based Price/Share	Market-Based Price/Share
$43.14	**$55.15**	**$35.24**	**N/A**

We chose not to base our judgment on relative valuation because we think there are additional factors beyond tax rate or revenue growth rate that can account for the company's price. However, given the limited number of comparable firms in the industry (very few companies operating in similar businesses as MGM, with comparable corporate scope, or experiencing a Macau rebound), we should refrain from introducing more variables that would make the valuation more uncertain or noisy. Furthermore, given the ongoing turbulence in the entire casino resort sector, there is a significant level of uncertainty that reflects noisiness in the sector pricing. Therefore, I recommend investing based on the corporate's specific long-term strategy (as outlined in "story"), which can be better captured in a discounted cash flow valuation.

DCF suggests that MGM is undervalued and we recommend investors to BUY the stock. The implied upside in DCF predicted stock price is attributed to several factors, including the anticipated significant rebound in Macau (when the Las Vegas sector rebounded from the pandemic in 2021, its revenue spiked by 110%, thus we expect Macau to experience a similar level of robust growth in revenue), positive prospects for MGM securing additional resort licenses in Japan and New York, potential profitability from expanding into the online sports betting and iGaming sectors, and stronger advantages of MGM as it just secured another 10 years of land concessions and gaming rights in Macau (legal protections) and possess huge brand equity. Technical analysis-wise, we do not see obvious buy signals eg. bullish divergence. Thus, we advise investors to patiently wait for a pullback in the short term and eventually buy in MGM stock.

Dollar Tree (NASDAQ:DLTR)

Price as of May 5, 2023 Close: $155.47

Company Overview:

Dollar Tree, headquartered in Chesapeake, Virginia, is a leading operator in the discount retail industry, offering customers consumables merchandise and seasonal products. By January 2022, the company operated 16,077 discount variety retail stores across 48 states in the US and 5 Canadian provinces. Dollar Tree, Inc operates under a dual-banner strategy with two separate brands. Dollar Tree provides discounted retail in suburban locations with 8,061 shops opening across the US and Canada, offering most of its merchandise at the fixed price point of $1.25, aiming to provide people with good-quality products at compelling prices. Family Dollar, with 8,016 shops opening across two countries, mostly targeted the lower-than-average income customers in urban and rural areas, offering fine products ranging from $1 to $10.

The competitive advantage of Dollar Tree is its successful purchasing strategy. The company develops strong purchasing power that allows negotiations with its suppliers to minimize the margin, even under macroeconomic pressure such as the imposition of tariffs. The company focused on meeting the target merchandise margin goal by categories also through flexibility in making sourcing decisions, with no vendor accounting for more than 10% of the total merchandise to eliminate over-reliance on specific vendors that may generate risk and inefficiencies.

Intrinsic Valuation

Dollar Tree						May-23
Dollar Tree is a discount retailer that has a history of 37 years. Composing of two brands, Dollar Tree and Family Dollar, the company aims to provide high quality grocery products in with low price points, with its stores opening mainly in rural and surburban areas across US and Canada. Due to its low pricepoints, the company performed relatively well even during the pandemic, with stable growth overall and healthy free cashflow to support its business. In the following year, based on the announcement made by the management teams and predictions, the comany will likely to continue its growth rate with further expansions through more store opening, and offering higher price-point products. With its scope expansion, eventually it may lower down its growth and become a mature company.						
The Assumptions						
	Base year	*Next year*	*Years 2-5*	*Years 6-10*	*After year 10*	*Link to story*
Revenues (a)	$28,331,700,000.00	8.0%	7.00%		3.55%	In the recent years, the revenue will continue to grow at the similar level with previous years. The management has announced the plans for continuing expanding its footprint thorugh opening more stores across US and Canada, with the industry rapidly growing due to the still underserved market for discount retailer. Eventually, with the increase in comeptition and the maarket being saturated, the revenue growth will slow down to lower rates.
Operating margin (b)	7.89%	12.0%			13.00%	The margin may be slightly improving. In recnet years they have been raising the average price poing from $1 to $1.25, and family dollar, a segment within the Dollar Tree brand, is planning to introducer higher-price end products, which may increase its margin by a bit. However, given the fact of the company being in the discounted retailer facing high price competition, I would not expect the margin to improve by too much.
Tax rate	23.46%		23.46%		25.00%	Global/US marginal tax rate over time
Reinvestment (c)		1.50	1.50	1.50	41.76%	Reinvestment will be maintained at Dollar Tree's current level with no significant changes to its invested capital

Return on capital	9.39%	Marginal ROIC =	29.07%		8.50%	The business is relatively stable with sustainable competitive advantages that are hard to gained for new entrants in the market. With the company become more mature over time, the ROC will decrease with decreasing amount of capital invested.
Cost of capital (d)			6.72%		8.50%	The cost of capital is initially low due to the nature of the business being consumer staple, selling non-descretionary products that usually serve as necessities, resulting in low beta. The expansion of the company may introduce increaesd level of risks that drives up the cos tof capital. With their operating lease increasing further in the future, it may become vulnerable with abilities to pay their interests (rent), which may increase the cost the debt, leading to an increasing cost of capital.
				The Cash Flows		
	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$30,598,236,000.00	12.00%	$3,671,788,320.00	$2,810,386,780.13	$1,511,024,000.00	$1,299,362,780.13
2	$32,740,112,520.00	12.25%	$4,010,663,783.70	$3,069,762,060.04	$1,427,917,680.00	$1,641,844,380.04
3	$35,031,920,396.40	12.38%	$4,335,200,149.05	$3,318,162,194.09	$1,527,871,917.60	$1,790,290,276.49
4	$37,484,154,824.15	12.50%	$4,685,519,353.02	$3,586,296,512.80	$1,634,822,951.83	$1,951,473,560.97
5	$40,108,045,661.84	12.63%	$5,063,640,764.81	$3,875,710,641.38	$1,749,260,558.46	$2,126,450,082.92
6	$42,638,863,343.10	12.75%	$5,436,455,076.25	$4,144,318,433.72	$1,687,211,787.51	$2,457,106,646.22
7	$45,035,167,462.98	12.88%	$5,798,277,810.86	$4,402,284,445.12	$1,597,536,079.92	$2,804,748,365.20
8	$47,255,401,218.91	13.00%	$6,143,202,158.46	$4,645,243,744.14	$1,480,155,837.28	$3,165,087,906.86
9	$49,259,030,230.59	13.00%	$6,403,673,929.98	$4,822,478,763.19	$1,335,752,674.45	$3,486,726,088.73
10	$51,007,725,803.78	13.00%	$6,631,004,354.49	$4,973,253,265.87	$1,165,797,048.79	$3,807,456,217.08
Terminal year	$52,818,500,069.81	13.00%	$6,866,405,009.08	$5,149,803,756.81	$2,150,800,392.55	$2,999,003,364.26
				The Value		
Terminal value			$60,585,926,550.66			
PV(Terminal value)			$30,088,907,277.10			
PV (CF over next 10 years)			$16,207,060,866.07			
Value of operating assets =			$46,295,968,143.17			
Adjustment for distress			$0.00		Probability of failure =	0.00%
- Debt & Minority Interests			$10,126,500,000.00			
+ Cash & Other Non-operating assets			$642,800,000.00			
Value of equity			$36,812,268,143.17			
- Value of equity options			$0.00			
Number of shares			221,222,984.00			
Value per share			$140.47		Stock was trading at =	$155.47

Based on the DCF Valuation, DLTR's intrinsic value per share is **$140.47.**

Relative Valuation

For the relative valuation portion, we screened firms with the following criteria:

- Same industry as Dollar Tree (Consumer Staple / Hyer market / Discounted Retail)
- Operating public companies with positive EBITDA
- Companies with similar market capitalization compared to Dollar Tree

Based on these criteria, 10 different companies were being used in generating the regression. We chose EBIT margin as the independent variable and EV/Sales as the dependent variable for the regression analysis as it generate the highest R^2 value when regressing relative to the sector.

***Pricing relative to its sector:* $141.04 / share**	EV/Sales = 0.112 + 16.44 * EBIT Margin (0.7268) (4.58) = 0.112 + 16.55 * 8% = 1.436	R^2 = 72.40%

***Pricing relative to the market:* $246.55 / share**	EV/Sales = 2.32 + 2.60 g + 10.60 OPM -1.40 DFR- 3.50 Tax Rate R^2 = 30.6% (10.66) (5.49) (21.61) (4.27) (5.42) = 2.32 + 2.60(7%) + 10.60(8%) - 1.40(19.07%) - 3.50(23.46%) = 2.26

Recommendation: SELL

Price as of May 5, 2023	Intrinsic Value/Share	Sector-Based Price/Share	Market-Based Price/Share
$155.47	**$140.47**	**$141.04**	**$246.55**

Based on both intrinsic valuation and sector-based pricing, the stock appears to be slightly overvalued and overpriced. However, market-based price/share valuation suggests that it is undervalued. Given that the company specializes in selling extremely low-priced necessity products to consumers, its vulnerability to market volatility may be lower than the overall market. As a result, sector-based pricing derived from similar businesses in the same industry may provide a more accurate prediction of its pricing.

Due to the current overpricing of Dollar Tree, we recommend a SELL for its stock, with the expectations of the market to gradually corrupt the overvaluation and overpricing with lower stock price trading.

Coca-Cola (NYSE:KO)

Price as of May 6, 2023 Close: $64.02

Company Overview: The Coca-Cola Company (NYSE: KO) is the world's largest nonalcoholic beverage company with products sold in more than 200 countries and territories, it is also the world's most valuable brand portfolio with unparalleled distribution capabilities. The company's purpose is to refresh the world and make a difference. The Coca-Cola Company's profile of brands includes Coca-Cola, Sprite, Fanta, and other sparkling soft drinks. The company constantly transforms its portfolio, from reducing sugar in drinks to bringing innovative new products to market.

Intrinsic Valuation

Coca-Cola--Iconic Global Beverage Brand

The-Coca-Cola Company is a global beverage company that was founded in 1886 in Atlanta, Georgia. The company has a rich history of growth and innovation, and is now one of the largest and most successful companies in the world. Coca-Cola's business model is built around producing and selling a wide range of beverages, including carboated soft drinks, juices, sports drinks, and energy drinks. Company's products are sold through a variety of channels, including retail stores, restaurants, vending machines, and online platforms. This diverse portfolio of products has enabled Coca-Cola to generate consistent cash flows over many years. Over the years, the company has expanded its product portfolio, acquired new brands, and entered new markets around the world. This has allowed Coca-Cola to maintain its position as global leader in the beverage industry, and to continue to grow its business over time. However, as a mature company, the growth rate of the company may slow down over time. Coca-Cola operates in a highly competitive industry, so the company faces a number of risks that could impact its future cash flows and growth prospects. For example, it is vulnerable to changing consumer preferences and trends in the beverage industry. Also, Coca-cola may faces some regulatory risks, such as taxes or some other marketing restrictions.

The Assumptions

	Base year	*Next year*	*Years 2-5*	*Years 6-10*	*After year 10*	*Link to story*
Revenues (a)	$43,004.00	7.5%	9.00%	→	3.44%	Coca-Cola is one of the most recognizable and iconic brands in the world. The company has demonstrated a commiitment to growth through strategic acquisitions and partnerships. So I assume that Coca-Cola is able to maintain its current level of market share and profitability, and the non-alcoholic beverage industry continues to grow at a modest pace. However, Coca-Cola is a mature company, it is reasonable to assume that its revenue growth rate will slow down over time.
Operating margin (b)	25.37%	25.0%	→		30.00%	Coca-Cola has historically had high operating margins, so I assume that the company will continue to maintain strong profitability. The company continues to benefit from its economies of scale and cost efficiencies, as well as its ability to leverage its established brands and distribution network to enter new markets and product categoties.
Tax rate	19.50%		19.50% →		19.00%	US marginal tax rate over time
Reinvestment (c)		1.44	1.44	1.70	28.67%	Coca-Cola's reinvestment rate may around 20%-30%, because the company has a large capital expenditure, as it needs to invest in bottling plants, distribution networks, and other infrastructure to support its operations. The company will continue to invest in expanding its product portfolio and developing new technologies to drive growth and maintain its competitive position in the non-alcoholic beverage industry.

Return on capital	23.78%	Marginal ROIC =	44.69%		12.00%	Coca-Cola is a mature and competitive company in the industry, the company is able to maintain its current level of profitability and investment in capital expenditures. In addistion, there are no significant changes to the competitive landscape or regulatory environment.
Cost of capital (d)			5.99%		8.88%	The company's debt-to-equity ratio remains around its current level, the interest rates remain relatively stable. Also, the company's capital structure remain similar to its current state. In addition, it is also based on the assumption that the risk-free rate of return and the market risk premium will remain relatively stable.

The Cash Flows

	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$46,229.30	25.00%	$11,557.33	$9,303.65	$2,880.59	$6,423.06
2	$50,389.94	26.00%	$13,101.38	$10,546.61	$3,139.84	$7,406.77
3	$54,925.03	26.50%	$14,555.13	$11,716.88	$3,422.43	$8,294.46
4	$59,868.28	27.00%	$16,164.44	$13,012.37	$3,730.45	$9,281.93
5	$65,256.43	27.50%	$17,945.52	$14,446.14	$3,027.90	$11,418.24
6	$70,403.86	28.00%	$19,713.08	$15,888.74	$2,806.21	$13,082.53
7	$75,174.42	28.50%	$21,424.71	$17,289.74	$2,504.63	$14,785.11
8	$79,432.30	29.00%	$23,035.37	$18,612.58	$2,126.92	$16,485.66
9	$83,048.06	29.50%	$24,499.18	$19,819.83	$1,680.50	$18,139.33
10	$85,904.91	30.00%	$25,771.47	$20,874.89	$1,738.31	$19,136.58
Terminal year	$88,860.04	30.00%	$26,658.01	$21,592.99	$6,189.99	$15,403.00

The Value

Terminal value	$283,143.38		
PV(Terminal value)	$145,942.61		
PV (CF over next 10 years)	$84,432.74		
Value of operating assets =	$230,375.35		
Adjustment for distress	$0.00	Probability of failure =	0.00%
- Debt & Minority Interests	$25,008.00		
+ Cash & Other Non-operating assets	$13,295.00		
Value of equity	$218,662.35		
- Value of equity options	$0.00		
Number of shares	4,326.00		
Value per share	$50.55	Stock was trading at =	$64.02

Based on the DCF Valuation, The Coca-Cola Company's intrinsic value per share is **$50.55.**

Relative Valuation

For the relative valuation portion, we screened firms with the following criteria:

- Companies that operate in the same industry as Coca-Cola, such as consumer goods or beverages.
- Companies that are similar in size to Coca-Cola in terms of market capitalization or revenues.
- Companies that have similar financial metrics as Coca-Cola, such as profit margins, return on equity, and debt-to-equity ratios.

We ended up with **16 comparable firms** across Asia, Europe, and North America. We chose next year's **Expected Growth in EPS** as the independent variable and **P/E ratio** as the dependent variable for our regression analysis since a P/E-based model yielded the highest R^2. The P/E ratio can provide insights into market expectations for Coca-Cola's future earnings growth and is commonly used to price consumer goods.

***Pricing relative to its sector:* $50.06 / share**	P/E = 13.7 + 131.2 gEPS (3.42) (13.48) = 13.7 + 131.2*0.069 = 22.75 R^2 = 63.2%
***Pricing relative to the market*:* $65.27/share**	P/E = 8.63 + 2.23 Beta + 46.20 gEPS + 19.30 Payout (5.13) (1.83) (10.42) (13.71) = 8.63 + 2.23*1.1 + 46.2*0.069 + 19.3*0.798 = 29.67 R^2 = 25%

Recommendation: HOLD

Price as of May 6, 2023	Intrinsic Value/Share	Sector-Based Price/Share	Market-Based Price/Share
$64.02	**$50.55**	**$50.06**	**$65.27**

The results of our DCF valuation and Sector-Based pricing regressions suggest that Coca-Cola is **overvalued and overpriced**. However, Market-Based pricing regressions suggest that Coca-Cola is **slightly underpriced**.

Our DCF valuation of Coca-Cola ($50.55) is done under generous assumptions because we believe Coca-Cola is a very established and competitive company in the beverage industry with strong brand power and name recognition. Even so, Coca-Cola is not worth the current trading price of $64.02. So we think it's very risky to buy Coca-Cola stock at this valuation. The market may have too much faith in Coca-Cola because it is a cultural icon and the business has been booming for decades. A booming business can always be overbought, and we think that's likely what's happening with KO stock.

Our recommendation is to HOLD Coca-Cola stock for now, as many investors are optimistic about the company, and the price is not set to correct itself anytime soon. In addition, Coca-Cola is a high-quality, heavy dividend stock with a steady growth rate. Coca-Cola is focusing on expanding its product portfolio, investing in marketing campaigns and digital transformation, which has made the company more competitive in the industry. Based on current conditions, Coca-Cola is still upbeat and preferred by investors, so it is safe to hold this stock for now.

Walmart Inc. (NYSE:WMT)

Price as of May 5, 2023 Close: $151.77

Company Overview:

Walmart is a multinational retail corporation that operates a chain of discount department stores, grocery stores, and hypermarkets. In addition to its physical stores, Walmart also has a strong online presence through its website and mobile app. Walmart generates revenue from its physical stores, e-commerce operations, and other ventures such as financial services and advertising. The company operates over 10,500 stores in 24 countries and has a significant presence in the United States, Mexico, and Canada. Their business model entails expansion to additional regions of the world while trying to better the standard at their current locations.

Walmart's competitive advantage can be attributed to its size and scale, which enable it to negotiate lower prices from suppliers and distribute goods efficiently, which translates to lower prices for customers. Walmart's supply chain management is another key factor, with the company investing heavily in technology and logistics to streamline operations and reduce costs. Walmart has also invested in e-commerce capabilities, allowing it to compete with online retailers and reach new customers. Walmart's focus on operational efficiency and continuous improvement has helped it to maintain its position as a leading retailer in the industry.

Intrinsic Valuation

		Walmart				May-23
		Stable growth and international expansion				
Walmart is one of the largest retailers in the U.S. and the globe. It will continue to bring optimal shopping experience through their omni-channel of in-person shopping and ecommerce. It will continue increasing operating efficiency and ecomonies of scale through improvement in infrastructure and technology. Along the way, it will continue to develop its ecommerce section and seek opportunites for expansion both in the U.S. and internationally, which requires continuing reinvestment.						
		The Assumptions				
	Base year	*Next year*	*Years 2-5*	*Years 6-10*	*After year 10*	*Link to story*
Revenues (a)	$611,298.00	6.0%	6.00%		2.80%	In the recent years, the revenue will continue to grow from its normal operation and its increasing presence in physital retail stors and E-commerce. Walmart is a mature company so its long term growth rate is expected to slow down.
Operating margin (b)	2.74%	4.5%			7.00%	As one of the world's largest retailers, Walmart has a great market share, which give it the bargaining power to access cheaper prices for their products. At the same time, due to its massive scale, it has a high economy of scales. By the end of Fiscal Year 2026, Walmart believes roughly 65% of stores will be serviced by automation, approximately 55% of the fulfillment center volume will move through automated facilities, and unit cost averages could improve by approximately 20%, which will will give it a higher operating margin in the future.
Tax rate	33.64%		33.64%		21.00%	The high effective tax rate is temporary due to separation, disposal and wind-down of certain business operations. The long term effective tax rate is expected to equal to Global/US marginal tax rate over time
Reinvestment (c)		4.60	5.00	5.00	28.00%	The company has a higher sales/capital ratio than the industry average. The company is expected to increase its efficiency of capital investment because as its business model will get more mature and efficient.

Return on capital	8.28%	Marginal ROIC =	68.05%		10.00%	The return on capital is expected to increase a little as it will expand overtime and increase its economy of scale.
Cost of capital (d)			7.78%		8.74%	Cost of capital close to median company

	Revenues	Operating Margin	EBIT	EBIT (1-t)	Reinvestment	FCFF
			The Cash Flows			
1	$647,975.88	4.50%	$29,158.91	$19,349.86	$7,973.45	$11,376.40
2	$686,854.43	5.50%	$37,776.99	$25,068.81	$7,775.71	$17,293.10
3	$728,065.70	6.00%	$43,683.94	$28,988.66	$8,242.25	$20,746.41
4	$771,749.64	6.50%	$50,163.73	$33,288.65	$8,736.79	$24,551.86
5	$818,054.62	7.00%	$57,263.82	$38,000.27	$9,261.00	$28,739.28
6	$861,902.35	7.00%	$60,333.16	$41,562.31	$8,769.55	$32,792.76
7	$902,584.14	7.00%	$63,180.89	$45,121.26	$8,136.36	$36,984.91
8	$939,409.57	7.00%	$65,758.67	$48,624.59	$7,365.09	$41,259.50
9	$971,725.26	7.00%	$68,020.77	$52,016.84	$6,463.14	$45,553.70
10	$998,933.57	7.00%	$69,925.35	$55,241.03	$5,441.66	$49,799.36
Terminal year	$1,026,903.71	7.00%	$71,883.26	$56,787.77	$15,900.58	$40,887.20

The Value			
Terminal value	$688,336.67		
PV(Terminal value)	$316,796.11		
PV (CF over next 10 years)	$190,740.94		
Value of operating assets =	$507,537.06		
Adjustment for distress	$0.00	Probability of failure =	0.00%
- Debt & Minority Interests	$97,405.45		
+ Cash & Other Non-operating assets	$8,625.00		
Value of equity	$418,756.61		
- Value of equity options	$0.00		
Number of shares	2,697.30		
Value per share	$155.25	Stock was trading at =	$151.77

Based on the DCF Valuation, Walmart's intrinsic value per share is **$155.25.**

Relative Valuation

For the relative valuation portion, we screened firms with the following criteria:

- Same industry as Walmart (Consumer Staples);
- Public traded companies in major exchanges and S&P 500 Consumer Staples (Sector) index.

We ended up with **36 comparable companies**. We chose **Expected 2-Year Revenue Growth** and **Operating Margin** as the independent variables and **EV/Sales** as the dependent variable for our regression analysis since it yielded the highest R-squared.

Pricing relative to its sector: $270.66 / share	EV/Sales = 0.4231 + 0.0487 g + 0.1584 OPM R^2 = 58.20% (0.423) (1.328) (6.815) = 0.4231 + 0.0487 * 4.56 + 0.1584 * 4.01 = 1.28
Pricing relative to the market*: $222.42 / share	EV/Sales = 2.32 + 2.60 g + 10.60 OPM -1.40 DFR- 3.50 Tax Rate R^2 = 30.6% (10.66) (5.49) (21.61) (4.27) (5.42) = 2.32 + 2.60(0.0456) + 10.60(0.0401) - 1.40(0.4432) - 3.50(0.336) = 1.067

Recommendation: BUY

Price as of May 5, 2023	Intrinsic Value/Share	Sector-Based Price/Share	Market-Based Price/Share
151.77	155.25	270.66	222.42

The DCF valuation, relative valuation, and market-based valuation all suggests that Walmart's stock price is undervalued. The DCF valuation yields a target stock price of $155.25, 2.3% higher than the current stock price (05/05/23); relative valuation yields a 78.33% higher stock price; and market-based valuation yields a 46.44% higher stock price. Relative valuation and market-based valuation both suggest a much higher price than its current price. Since the relative valuation only takes into account two independent variables (operating margin and estimated revenue growth rate), it may not capture all the factors that drive changes in EV/sales so it might have some deviations. The DCF valuation relies on numerous assumptions that are clearly stated and can be modified to reflect new information, which might be more informative. **Overall, we believe that Walmart is undervalued and recommend investors to BUY Walmart's stock.**

Pinduoduo Holdings Inc (NASDAQ:PDD)

Price as of May 5, 2023 Close: $63.06

Company Overview

Pinduoduo Holdings Inc (NASDAQ: PDD) is an e-commerce company founded in 2015. It is based in China, providing a technology platform for individual consumers and small and medium-sized businesses to transact affordable products. PDD Holdings has built a network of sourcing, logistics, and fulfillment capabilities, that support its underlying businesses. Due to the special proposition and strong customer experience, it experienced remarkable growth and become the third-largest e-commerce platform in the local market. Pinduoduo ramped up its user pool to 900 million users within seven years and now holds a ~24% market share in China.

PinDuoDuo differentiates itself from its competitors Alibaba and JD by targeting consumers in low-tiered cities demanding low-priced products. At first, it offered heavy discounts as part of its R&D strategy to gain brand recognition and a customer base. After this seed stage, it raised the product prices to normal levels, though still outstandingly lower than competitor prices. Unlike Amazon, PinDuoDuo ship products directly from the SMBs to consumers without holding inventory, which also grants the company a low-risk nature due to less required cash.

Intrinsic Valuation

Pinduoduo	**May-23**
A New E-Commerce King That Keeps Growing	
Being the third largest e-commerce platform in China, PDD has secured a special and powerful value proposition of cheap products from SMBs. ***Cash Flow:*** The past seven years since its founding have shown its strong and growing cash flow, and its hard-to-shake market position in the local market can strengthen the stability of the cash flows. PDD's achievements (of becoming a market leader within a short period) were built by significant capital investment in the early stage for user acquisition and logistic management, which attracted a large customer base with loyalty. Therefore, though it is possible that substitute companies will enter the market with similar business models and strategies, considering that PDD is already successful and has more power in the cost leadership segment by the economics of scale, the possibility that the substitutes will take over large market share from PDD is low. ***Growth:*** PDD's growth has been remarkable since its founding, largely due to its investment in marketing campaigns and discount strategy for first-time buyers in the China market. The growth rate is gradually slowing down as the effect from previous investments has shown, and the target segment available for user conversion has been depleted. However, PDD has started a new project to enter the NA market in the form of a subsidiary called Temu. Available information on Temu is limited, but based on the marketing strategy it applied to social media and video platforms, it can be seen that PDD is trying to copy its path in the local market. PDD hasn't shown any solid financial results from the market entry opportunity, but its execution in the past and the success of Shein (an e-commerce platform selling cheap clothes) show a high likelihood of business growth in the near term. ***Risk:*** On the macro level, PDD mainly operates in China, which is considered an emerging market with relatively high risk. On the micro level, PDD applies an end-to-end shipping model without inventory management needs, reducing the risk of supply chain issues, working capital, or stock overload. The company's risk may increase from its market expansion plan, but since it is entering a mature market with lower country risk, the risk from failure of the market entry plan can be partially offset.	

The Assumptions						
	Base year	*Next year*	*Years 2-5*	*Years 6-10*	*After year 10*	*Link to story*
Revenues (a)	$14,742,796.00	57.9%	35.00%		1.69%	Growing sales in local market and expansion to US market last year drive the short-term growth rate, but all possible market will be depleted in long-term and the company will enter the stable stage
Operating margin (b)	14.21%	14.21%			18.00%	Margin improve due to the economic of scales in logistics, technology maintainence, proficiency in operations, etc.
Tax rate	25.00%	20.45%	25.00%		25.00%	Marginal tax rate is lower due to NOL carring forward; assumed as tax rate will converge to effective tax rate indicated in the company annual report
Reinvestment (c)		2.45	2.80	3.00	9.39%	Maintained at Pinduoduo's current level in the long-term; though in the short-run, it is expected a high investment to enter the foreign market, the company's current revenue level and significant revenue growth will moderate the ratio
Return on capital	26.14%	Marginal ROIC =	27.78%		18.00%	Moderate competitive edges that will maintain the company's position in the local market and aggressive foreign market expansion plan that will allow the company enjoy similar growth patterns with certain level of risks may together drag down the ROIC but not too much; high marginal ROIC is due to the delayed effect from previous investment in customer acquisition
Cost of capital (d)			8.58%		7.63%	Cost of capital is high in short-term due to constant investment and expansion plan, but will move close to median Chinese company in the long-term after entering the stable stage where the number new of projects taken will drop and company-specific risk decrease

The Cash Flows						
	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	$23,281,919.05	14.21%	$3,308,924.80	$3,109,050.72	$3,482,223.13	-$373,172.41
2	$31,430,590.71	13.37%	$4,202,250.60	$3,151,687.95	$2,910,239.88	$241,448.07
3	$42,431,297.46	12.95%	$5,494,299.74	$4,120,724.80	$3,928,823.84	$191,900.97
4	$57,282,251.58	12.53%	$7,176,007.58	$5,382,005.68	$5,303,912.18	$78,093.50
5	$77,331,039.63	12.11%	$9,361,859.19	$7,021,394.39	$6,682,929.35	$338,465.04
6	$99,245,109.64	11.68%	$11,596,760.47	$8,697,570.35	$7,304,690.00	$1,392,880.35
7	$120,757,479.60	11.26%	$13,601,792.69	$10,201,344.52	$7,170,789.99	$3,030,554.53
8	$138,888,007.59	10.84%	$15,058,910.81	$11,294,183.11	$6,043,509.33	$5,250,673.78
9	$150,487,933.98	10.42%	$15,682,712.22	$11,762,034.17	$3,866,642.13	$7,895,392.04
10	$153,031,180.07	10.00%	$15,303,118.01	$11,477,338.50	$847,748.69	$10,629,589.81
Terminal year	$155,617,407.01	10.00%	$15,561,740.70	$11,671,305.53	$1,095,805.91	$10,575,499.62

Terminal value	$178,038,714.11		
PV(Terminal value)	$80,270,819.14		
PV (CF over next 10 years)	$14,226,773.98		
Value of operating assets =	$94,497,593.11		
Adjustment for distress	$7,937,797.82	Probability of failure =	12.00%
- Debt & Minority Interests	$2,310,570.00		
+ Cash & Other Non-operating assets	$1,111,473.00		
Value of equity	$85,360,698.29		
- Value of equity options	$0.00		
Number of shares	1,274,084.50		
Value per share	$67.00	Stock was trading at =	$63.06

Based on the DCF Valuation, PinDuoDuo's intrinsic value per share is **$67.00.**

Relative Valuation

For the relative valuation portion, we screened firms with the following criteria:

- Companies that operate in the same industry as PDD (Online Borderline Retail).
- Companies that are similar in market capitalization to PDD, less than 100B.

We ended up with **18 comparable companies**. We chose **Est. Annual Revenue Growth in 1Yr** and **EBIT Margin as the independent variables** and **EV/Sales** as the dependent variable for regression analysis since it yielded the highest R-squared.

Pricing relative to its sector: $19.02 / share	EV/Sales = 1.027 + 0.770 g + 0.430 OPM R^2 = 14.02% (2.605) (2.521) (1.833) = 1.027 + 0.770(0.35) + 0.430(0.233) = 1.558
Pricing relative to the market: $48.34 / share	EV/Sales = 3.22 + 1.60 g + 4.40 OPM + 1.50 DFR- 2.80 Tax rate R^2 = 5.6% (16.86) (5.35) (8.80) (5.36) (4.65) = 3.22 + 1.60(0.579) + 4.40(0.233) - 1.50(0.126) - 2.80(0.205) = 3.82

Recommendation: BUY

Price as of May 5, 2023	Intrinsic Value/Share	Sector-Based Price/Share	Market-Based Price/Share
$63.06	$67.00	$19.02	$48.34

The results of our DCF valuation suggest that PDD is **undervalued**. However, Sector-based and Market-Based pricing regressions suggest that PDD is **overpriced**. Since the R^2 figures for both pricing regressions were very low, we want to base our recommendation on the DCF valuation instead.

The Sector-Based regression model cannot really explain much of the pricing among online broad-line retailers, and the small comparable company sample size certainly does not help either. Bias can be aggravated by the cross-sector comps selection since there are only less than five comps in each sector.

PDD as an already successful e-commerce company in the local market is expanding to the North American region, trying to replicate the same business model. Though without much financial information on the specific plan, it is reasonable to expect revenue growth from a successful replication of its social commerce business model for the following years in the near term.

In summary, for reasons that 1) PDD stock is intrinsically worth more than the current price of $63.06, and 2) that the pricing does not reflect the company's growth potential— we recommend a BUY.

NIO Inc. (NYSE:NIO)

Price as of May 5, 2023 Close: $8.15

Company Overview:

NIO is a Chinese electric vehicle (EV) manufacturer founded in 2014. The company's mission is to shape a joyful lifestyle by offering premium smart electric vehicles and providing the highest quality user experience. NIO's electric vehicles consist of the ES8, ES6, EC6, and ET7, all designed to offer a high level of luxury and performance.

Besides manufacturing electric vehicles, NIO also operates an innovative charging network, including Power Swap Stations, which allow drivers to quickly swap out their vehicle's battery pack for a fully charged one. Additionally, the company offers its customers financing, insurance, and maintenance services.

NIO is headquartered in Shanghai, China, but also has significant operations in Silicon Valley and Europe. In 2018, the company went public on the New York Stock Exchange and has since gained a significant following among investors who are optimistic about the future of electric vehicles.

Intrinsic Valuation

Chinese Premium electric vehicle manufacturer
NIO builds a premium brand that offers its customers the best possible user experience. NIO's product portfolio includes the ES8, ES6, EC6, and ET7, all of which feature advanced technologies such as artificial intelligence, autonomous driving capabilities, and smart connectivity. The company's EVs are designed to be environmentally friendly, with a range of over 600 km on a single charge, making them practical for everyday use.The company has worked hard to establish a sustainable business model that generates positive cash flows and enables it to reinvest in its growth. This has included developing innovative products, such as its Power Swap Stations, which generate recurring revenue from customers who need to charge their vehicles quickly and efficiently. By focusing on cash flows, NIO has maintained a strong balance sheet and position itself for long-term success. The company has been expanding its product portfolio and geographic footprint rapidly in recent years. Furthermore, NIO offers a range of services that are aimed at enhancing the user experience, such as vehicle financing, insurance, and maintenance. Besides China, the company has also expanded into Europe, where it is establishing a presence in key markets such as Germany and Norway. By pursuing aggressive growth strategies, NIO is positioning itself to capture a larger share of the rapidly growing EV market. Of course, with any growth strategy comes risk, and NIO has not been immune to this. The company faces intense competition from both domestic and international manufacturers of electric vehicles, and the market for electric vehicles remains highly volatile and subject to shifting regulatory and consumer preferences. However, NIO has taken steps to mitigate these risks by diversifying its revenue streams and focusing on developing a strong brand. By taking calculated risks and adapting quickly to market changes, NIO has positioned itself to be a major player in the EV space for years to come.

The Assumptions

	Base year	*Next year*	*Years 2-5*	*Years 6-10*	*After year 10*	*Link to story*
Revenues (a)	$49,268,561.00	55.0%	16.00%		3.35%	NIO's management reiterated that they are "very confident" about achieving an annual delivery target of 250,000 vehicles in 2023, which is a 100% growth rate. NIO is capable of supporting such an expansion, and Tesla has demonstrated its ability to ramp up to 250K+ vehicles within a short period of time. Despite this, deliveries in Q1 came up at the low end of guidance at 31,041 units. The minimum delivery level for Q2 likely needs to be approximately 49,000 vehicles, bringing the 1H total to nearly 80,000 vehicles in order to ramp to an average of 27,000 vehicles per month in the 2H. It is definitely possible, but it will be a challenge, especially as other OEMs like Tesla, XPeng, Seris, BYD, and others are cutting prices to stimulate sales. Thus, the assumption for the 2023 growth rate is 55%.

Operating margin (b)	-31.75%	-15.0%			11.40%	NIO has invested heavily in research and development, marketing, and other operating expenses to expand its production capacity and develop new products. This has resulted in a negative operating margin for the company in recent years, meaning that NIO is currently generating losses from its operations. The company has outlined plans to reduce operating expenses and improve operating efficiency in the future in order to achieve positive operating margins. The company has increased its sales volume and revenue, which has resulted in a spread out of fixed costs and an improvement in economies of scale. Additionally, NIO has reduced its operating expenses by implementing cost-cutting measures and improving efficiency. Lastly, the company has introduced new products with higher margins, such as the EC6 and ET7, which have contributed to its improvement in financial performance.
Tax Rate	0.38%		0.38%		25.00%	NIO's effective tax rate is low as a result of its net loss. The Chinese government offers tax incentives to companies in the automotive industry, including NIO. At some point, however, NIO is likely to profit and use the marginal tax rate. EV policies and incentives have been subject to change in recent years, and some reports indicate reduced subsidies and other forms of assistance for EV industry.
Reinvestment (c)		-2.22	0.60	1.40	24.71%	NIO's sales to capital ratio may increase in the next ten years due to its increased production capacity improved operational efficiency, development of new products, and increased demand for electric vehicles.
Return on capital	-65.26%	Marginal ROIC =	32.23%		13.56%	In the next ten years, NIO will undergo significant changes in its operations and financial performance, which will result in a significant improvement in ROC. Factors such as sales growth, margin improvement, capital efficiency, and competition will all play a role in determining NIO's future ROC.
Cost of capital (d)			11.35%		7.67%	NIO may be able to improve its financial management practices over the next decade, including optimizing its capital structure, improving cash flow management, and reducing risk. If NIO achieves strong financial performance and demonstrates a profitability track record, it may be viewed as a lower-risk investment by lenders and investors. This could lead to a decrease in debt and equity financing costs. As NIO establishes itself in the marketplace, it may be able to negotiate lower interest rates on its debt financing. It is possible that this will reduce the overall cost of capital.

The Cash Flows

	Revenues	*Operating Margin*	*EBIT*	*EBIT (1-t)*	*Reinvestment*	*FCFF*
1	¥ 76,366,269.55	-15.00%	¥ -11,454,940.43	¥ -11,454,940.43	¥ 12,179,199.78	¥ -23,634,140.21
2	¥ 88,584,872.68	-8.40%	¥ -7,441,129.30	¥ -7,441,129.30	¥ 20,364,338.55	¥ -27,805,467.85
3	¥ 102,758,452.31	-5.10%	¥ -5,240,681.07	¥ -5,240,681.07	¥ 23,622,632.71	¥ -28,863,313.78
4	¥ 119,199,804.68	-1.80%	¥ -2,145,596.48	¥ -2,145,596.48	¥ 27,402,253.95	¥ -29,547,850.43
5	¥ 138,271,773.42	1.50%	¥ 2,074,076.60	¥ 2,074,076.60	¥ 13,622,834.82	¥ -11,548,758.22
6	¥ 156,896,981.30	4.80%	¥ 7,531,055.10	¥ 7,531,055.10	¥ 13,303,719.91	¥ -5,772,664.81
7	¥ 174,061,511.06	8.10%	¥ 14,098,982.40	¥ 14,098,982.40	¥ 12,260,378.40	¥ 1,838,604.00
8	¥ 188,700,084.14	11.40%	¥ 21,511,809.59	¥ 21,511,809.59	¥ 10,456,123.63	¥ 11,055,685.96
9	¥ 199,795,649.09	11.40%	¥ 22,776,704.00	¥ 19,239,309.15	¥ 7,925,403.53	¥ 11,313,905.62
10	¥ 206,488,803.33	11.40%	¥ 23,539,723.58	¥ 17,654,792.68	¥ 4,780,824.46	¥ 12,873,968.22
Terminal year	¥ 213,406,178.24	11.40%	¥ 24,328,304.32	¥ 18,246,228.24	¥ 4,507,733.38	¥ 13,738,494.86

The Value

Terminal value	¥ 318,020,714.35		
PV(Terminal value)	¥ 119,989,575.75		
PV (CF over next 10 years)	¥ -78,366,963.40		
Value of operating assets =	¥ 41,622,612.34		
Adjustment for distress	¥ 122,786.71	Probability of failure =	0.59%
- Debt & Minority Interests	¥ 19,986,586.00		
+ Cash & Other Non-operating assets	¥ 65,302,578.00		
Value of equity	¥ 86,815,817.64		
- Value of equity options	¥ -		
Number of shares	1,690,000.00		
Value per share	¥ 51.37	Stock was trading at = ¥	55.68
Value per share in USD	$7.29	Stock was trading at =	$8.15

Based on the DCF Valuation, NIO's intrinsic value per share is **$7.29.**

Relative Valuation

For the relative valuation portion, we ended up with **21 comparable firms**. We chose **Revenue Growth and EBIT margin %** as the independent variables and **EV/Sales** as the dependent variable for our regression analysis, since an EV/Sales-based model yielded the highest R^2.

***Pricing relative to its sector:* $19.66 / share**	EV/Sales = 1.93 - 0.57*g - 7.21*EBIT Margin R^2 = 60.26% (1.77) (-1.53) (-2.06) = 1.93 - (0.57) *(55%) - (7.21)*(-31.75%) = 3.9
***Pricing relative to the market*:* $8.68/ share**	EV/Sales = 2.68 + 2.50 g + 8.10 OPM +2.10 DFR- 5.10 Tax Rate R^2 = 17.8% (23.97) (11.49) (28.98) (13.26) (15.15) = 2.68 + 2.50(0.55) + 8.10(-0.3175) - 2.10(0.016) - 5.10(0.038) = 1.254

Recommendation: BUY

The results of our DCF valuation, our sector-based pricing regression, and our market-based pricing regression suggest that NIO is **overvalued** but **underpriced** relative to both its sector and the market.

Price as of May 5, 2023	Intrinsic Value/Share	Sector-Based Price/Share	Market-Based Price/Share
$8.15	**$7.29**	**$19.66**	**$8.68**

We chose to override our DCF and base our recommendation on the market pricing. The EV industry is expected to experience significant growth in the coming years due to increasing consumer demand for environmentally-friendly vehicles and government incentives to promote EV adoption. Companies with strong growth prospects are valued higher because investors are willing to pay a premium for companies with strong growth prospects.

Although NIO is an important player in the electric vehicle industry, it is still a relatively young company and has not yet achieved the same market share or level of growth potential as some of its competitors. NIO is not profitable, as it continues to invest heavily in research and development, production capacity, and marketing, but NIO has a strong financial position, with significant funding from investors and a large cash reserve. This gives the company the financial resources it needs to continue to invest in research and development, expand production capacity, and grow its market share. NIO is known for its advanced battery technology, which allows its vehicles to achieve longer driving ranges and faster charging times than many of its competitors. The company is also investing in autonomous driving technology, which could position it well for the future of the automotive industry. NIO has established a strong brand identity in the Chinese market, with its innovative designs and focus on technology and sustainability. **Thus, we advise investors to BUY NIO stock**.