FS ASSOCIATES
STUDENT INITIATIVE OF
FRANKFURT SCHOOL

October 10, 2020

Investment Report

This report was written by Quirin Zundl, Lukas Stoffel, Joy He, Vitalij Vycerov and Marco Solleder and is the intellectual property of FS Associates.

Picture: FS Associates during a team meeting in early September 2020

On September 28th, during an Investment Meeting, we discussed the details of our proprietary valuation model. Marco Solleder decided to look into PepsiCo as a relatively straightforward valuation. We want to disclose that Quirin Zundl holds a significant personal share in PepsiCo stock and has made good experiences in the past with this company. Additionally, PepsiCo reported better than expected earnings on October 1st, 2020. In the context of the Covid-19 crisis this is an interesting company to assess, as it demonstrates high resilience due to its business model. The fundamental and technical analysis part was covered by Quirin Zundl, Lukas Stoffel and Joy He. The valuation part was covered by Marco Solleder and Vitalij Vycerov.

All information used in this report is publicly available and was extracted from:

a) PepsiCo Annual Reports and Company Presentations 2010 – 2019

b) PepsiCo Quarterly Reports 2020

c) Coca Cola Annual Reports 2010 - 2019

d) Bloomberg Data

e) S&P Capital IQ data

I. Business Overview

In accordance with their mission to 'create more smiles with every sip and every bite' PepsiCo is a multinational corporation headquartered in Harrison, NY, that follows the vision to 'be the global leader in convenient foods and beverages by winning with purpose'. Pepsi focuses on manufacturing beverages, food, and snack products.

In terms of beverages, PepsiCo's main competitor is Coca-Cola, followed by Dr. Pepper Snapple, and The Kraft Heinz Company. Also, due to the acquisition of the Rockstar brand in March 2020, Red Bull and Monster Beverage need to be considered as competitors of PepsiCo's operations. When it comes to food and snacks the company competes with Nestlé, Mondelez International, General Mills, Procter and Gamble, Conagra Brands Inc, Hershey Co, and Tyson Foods.

Starting off with the merger of Pepsi-Cola Company and Frito-Lay Inc in 1965, PepsiCo has grown its operations to a diversified portfolio of 23 individual brands that generate over USD 1bn in annual sales each.

Please see a brief overview of some of Pepsi's main brands below:

Brandname	Category	Brand logo	Product description	Note
Pepsi	Beverages		carbonated soft drinks in different variants	
Mountain Dew	Beverages		carbonated soft drinks	
Dole	Food		Fresh plant foods (whole fruits, vegetables, berries, fresh-cut, packaged products)	
Gatorade	Beverages (and supplemetary food)		Sports drinks	
Mirinda	Beverages		Fruit based soft drinks	Not in North America
Punica	Beverages		Fruit juice	Not in North America
7 Up	Beverages		lemon-lime-flavored non-caffeinated soft drink	Not in North America
Cracker Jack	Food and snacks		snack food consisting of molasses-flavored, caramel-coated popcorn, and peanuts	
Doritos	Food and snacks		Tortilla chips	
Fritos	Food and snacks		Corn chips	
Lay's	Food and snacks		Potato chips	
Walkers	Food and snacks		Potato chips	Not in North America

Based on net revenue, PepsiCo is the second largest food and beverage manufacturer in the world behind Nestlé.

II. Segments

In the regional segmentation, Pepsi's operations in North America heavily outweigh Europe, Latin America, and the rest of the world, as North America accounts for 60% of net revenues and about 70% of operating income since 2010. Also, the operating margin is significantly higher in North America. However, the operating margin in North America has decreased from 20,2% in 2015 to 18,1% in 2020E, while the operating margins in Latin America and the rest of the world have increased over this period. The operating margin in Europe has been stable between 10% and 11% since 2010. Over the course of the recent 10 years, revenues in North America have grown continuously by 18,2% in total. Operating income in the same region has grown by only 10,6% in total, including the expected decrease of 4.4% from 2019 to 2020E. Both overall net revenue as well as overall operating income have grown by just below 12% since 2010.

Please see below:

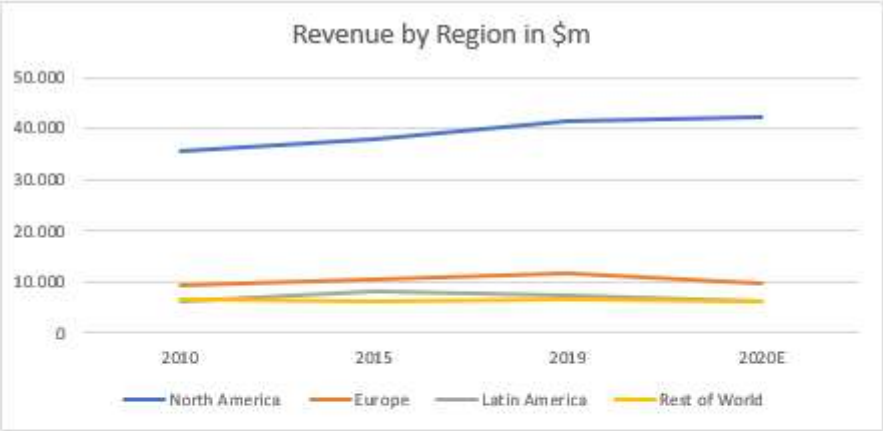
Segmentation by region

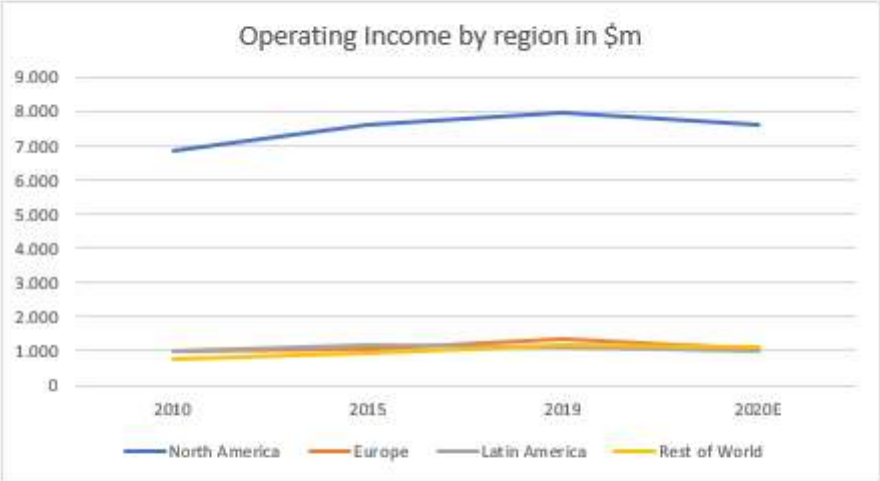
Revenue (in $ Millions)	2010	2015	2019	2020E
North America	35.630	37.943	41.290	42.148
Europe	9.254	10.510	11.728	9.889
Latin America	6.315	8.228	7.573	6.234
Rest of World	6.639	6.375	6.570	6.353

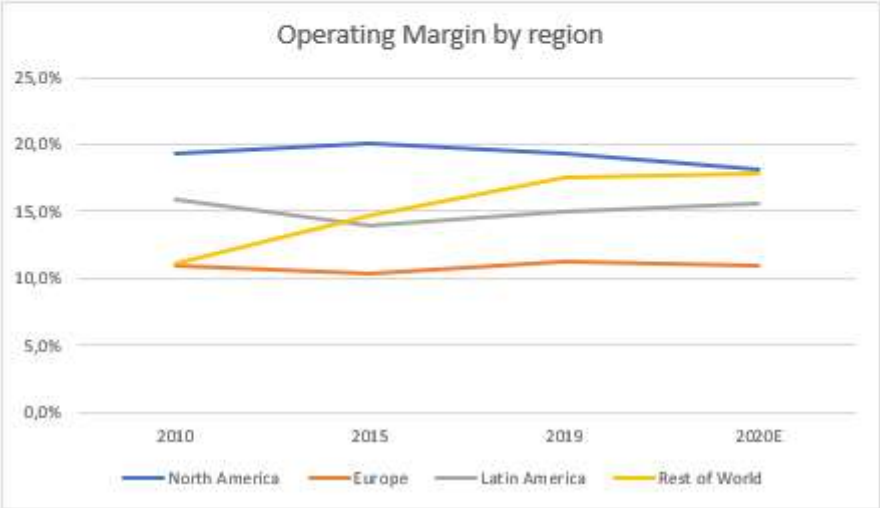
Operating Income (in $ Millions)	2010	2015	2019	2020E
North America	6.893	7.650	7.981	7.627
Europe	1.020	1.081	1.327	1.077
Latin America	1.004	1.153	1.141	975
Rest of World	742	941	1.148	1.135

Operating Margin	2010	2015	2019	2020E
North America	19,3%	20,2%	19,3%	18,1%
Europe	11,0%	10,3%	11,3%	10,9%
Latin America	15,9%	14,0%	15,1%	15,6%
Rest of World	11,2%	14,8%	17,5%	17,9%

adjusted for Venezuela Impairment


Revenue by Region in $m
50.000
40.000
30.000
20.000
10.000
0
2010
2015
2019
2020E
North America
Europe
Latin America
Rest of World


Operating Income by region in $m
9.000
8.000
7.000
6.000
5.000
4.000
3.000
2.000
1.000
0
2010
2015
2019
2020E
North America
Europe
Latin America
Rest of World


Operating Margin by region
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
2010
2015
2019
2020E
North America
Europe
Latin America
Rest of World

The segmentation by products in North America shows that revenues in both *food and snacks* and *beverages* have grown since 2010. Food and snacks have shown a total of 37,2% growth over this period while beverages have only shown a total of 4,2% growth since 2010. The result is that PepsiCo almost aligned the revenue contribution of both segments coming from a portfolio composition of 43% food and snacks and 57% beverages in 2010. In terms of operating income, the food and snacks segment has also been performing extraordinary well with a total of 48,7% EBIT growth from 2010 to 2020E. The operating income of beverages has decreased by over 45% in total since 2010. As can be expected, considering the stable revenues in this segment, this is caused by a significant decrease in operating margin by from 13.6% in 2010 to 7.1% in 2020E.

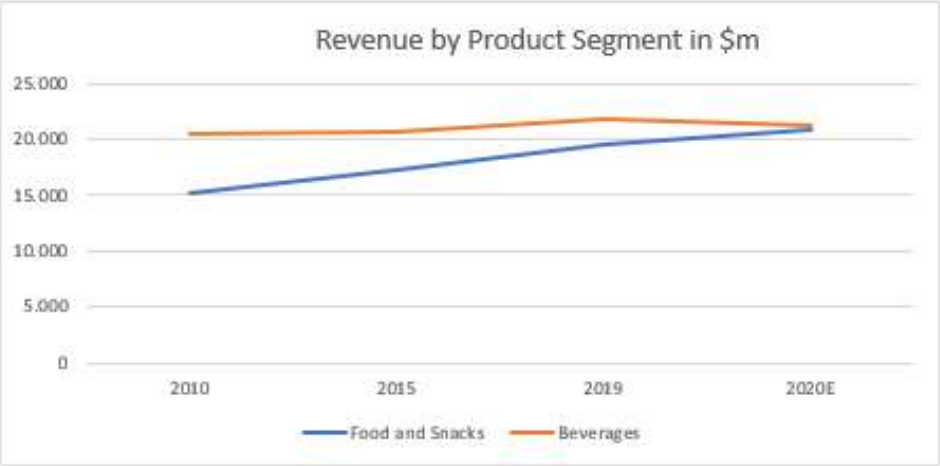
Please see below:

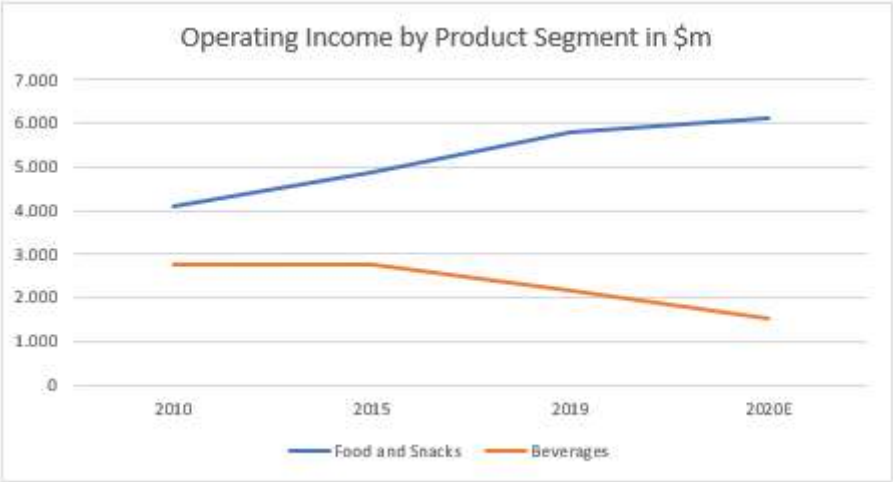
Segmentation by products for North American data

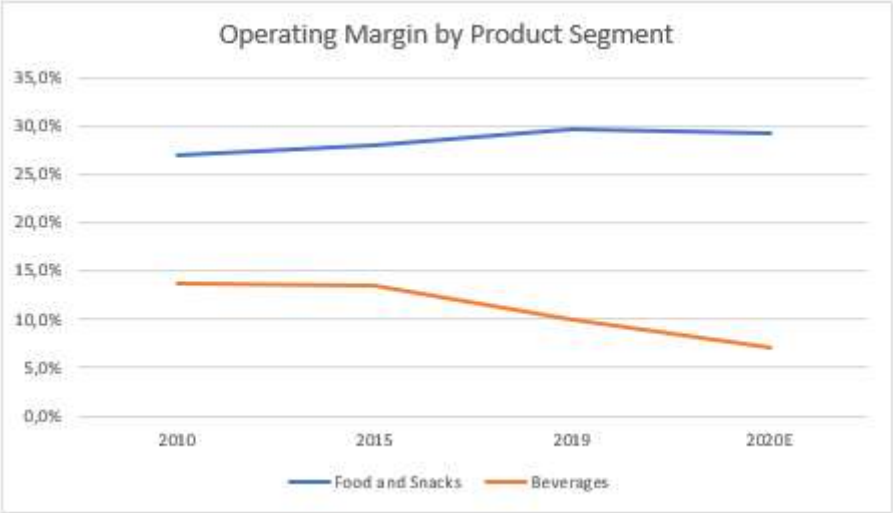
Revenue (in $ Millions)	**2010**	**2015**	**2019**	**2020E**
Food and Snacks	15.229	17.325	19.560	20.898
Beverages	20.401	20.618	21.730	21.251

Operating Income (in $ Millions)	**2010**	**2015**	**2019**	**2020E**
Food and Snacks	4.117	4.864	5.802	6.123
Beverages	2.776	2.785	2.179	1.504

Operating Margin	**2010**	**2015**	**2019**	**2020E**
Food and Snacks	27,0%	28,1%	29,7%	29,3%
Beverages	13,6%	13,5%	10,0%	7,1%







III. Financials

1. IRR Model

In the 2007-2012 period, Pepsi returned 5,4% per year while in the 2014-2019 period, PepsiCo's return was 8,6% per year.

The 2007-2012 period includes three large mergers in 2010, namely the acquisition of two independent Pepsi bottling operations (Pepsi Bottling and Pepsi-Americas) for a total of USD 7,8bn and the acquisition of Wimm-Bill-Dann, a Russian dairy and juice company, for USD 5,8bn:

https://www.forbes.com/sites/steveschaefer/2016/07/06/ma-flashback-pepsis-bottling-reunion/#36cf7b202c8f

https://www.ftc.gov/news-events/press-releases/2010/02/ftc-puts-conditions-pepsicos-78-billion-acquisition-two-largest

The acquisitions in 2010 had a significant effect on Pepsi's debt level and revenues, however they were not particularly value-adding in the short term.

In the 2014-2019 period, Pepsi conducted no significant mergers of similar size. Instead, the company displayed moderate organic growth, bought back stock, and paid large dividends, resulting in an IRR of 8,6% per year.

What we find impressive is the consistency with which Pepsi delivers revenues and a fairly stable adjusted EBIT margin in the 15% area. One can see that the mergers reduced the adjusted EBIT margin, however Pepsi is slowly recovering. Nevertheless, Pepsi has not recovered the 18% margin before the mergers – this remains a target for Management to achieve. In the meantime, the 2014-2019 period has been one of consistency for Pepsi. Additionally, Pepsi demonstrated crisis resiliency in the 2007-2009 period, with no negative impact observable despite global recession.

We ask for the reader's understanding that the IRR model used is proprietary and can therefore not be explicitly displayed.

2. Free Cash Flow to Equity

PepsiCo is a very impressive cash generator. The company delivered a consistent annual USD 5-7bn of Free Cash Flow to Equity between 2017 and 2019. At the current market capitalization of USD 190,8bn this is equivalent to a FCF yield of ca. 3%.

	2017	2018	2019
Net Income	4.908,0	12.559,0	7.353,0
Depreciation and Amortization	2.369,0	2.399,0	2.432,0
Deferred income taxes and other tax charges and credits	619,0	-531,0	453,0
Share-based compensation expense	292,0	256,0	237,0
Pension and retiree medical plan expenses	221,0	221,0	519,0
Pension and retiree medical plan contributions	-220,0	-1.708,0	-716,0
Other net tax benefits related to international reorginazations	0,0	-4.347,0	-2,0
Income taxes payable	-338,0	448,0	-287,0
Capital Spending	-2.969,0	-3.282,0	-4.232,0
Sales of Property, plant and equipment	180,0	134,0	170,0
Other acquisitions and investments in noncontrolled affiliates	-61,0	-299,0	-778,0
Divestitures	267,0	505,0	253,0
Owner Earnings	**5.268,0**	**6.355,0**	**5.402,0**
Inventories	-168,0	-174,0	-190,0
Accounts and notes receivable	-202,0	-253,0	-650,0
Prepaid Expenses and other Current Assets	20,0	9,0	-87,0
Accounts Payable and other current liabilities	201,0	882,0	735,0
Change in Net Working Capital	**-149,0**	**464,0**	**-192,0**
FCFE after Tax	**5.119,0**	**6.819,0**	**5.210,0**

3. Income Statement

Analyzing the Income Statement was not a must in the PepsiCo case, as the EBIT margins are relatively stable, however we did the job anyway. A main finding is that PepsiCo had a consistent gross margin between 52% and 55% between 2012 and 2019. Over the past years, Pepsi was able to slightly improve the gross margin and to reduce overhead costs. Additionally, Pepsi increased marketing and advertisement expenses in relation to revenues.

Overall, PepsiCo displays a very solid Income Statement:

	2012	2013	2014	2015	2016	2017	2018	2019	Margin 2019 vs 2012	Margin 2019 vs 2016
Revenue in $m	65.492,0	66.415,0	66.683,0	63.056,0	62.799,0	63.525,0	64.661,0	67.161,0		
Revenue Growth		*1,4%*	*0,4%*	*-5,4%*	*-0,4%*	*1,2%*	*1,8%*	*3,9%*		
COGS in $m	31.291,0	31.243,0	31.238,0	28.731,0	28.209,0	28.796,0	29.381,0	30.132,0		
Gross Profit in $m	34.201,0	35.172,0	35.445,0	34.325,0	34.590,0	34.729,0	35.280,0	37.029,0		
Gross Margin	*52,2%*	*53,0%*	*53,2%*	*54,4%*	*55,1%*	*54,7%*	*54,6%*	*55,1%*	2,9%	0,1%
Distribution Costs	9.100,0	9.400,0	9.700,0	9.400,0	9.700,0	9.900,0	10.500,0	10.900,0		
As % of revenue	*13,9%*	*14,2%*	*14,5%*	*14,9%*	*15,4%*	*15,6%*	*16,2%*	*16,2%*	-2,3%	-0,8%
Advertising and Marketing	3.700,0	3.900,0	3.900,0	3.900,0	4.200,0	4.100,0	4.200,0	4.700,0		
As % of revenue	*5,6%*	*5,9%*	*5,8%*	*6,2%*	*6,7%*	*6,5%*	*6,5%*	*7,0%*	-1,3%	-0,3%
Capital Spending	2.714,0	2.795,0	2.859,0	2.758,0	3.040,0	2.969,0	3.282,0	4.232,0		
As % of revenue	*4,1%*	*4,2%*	*4,3%*	*4,4%*	*4,8%*	*4,7%*	*5,1%*	*6,3%*	-2,2%	-1,5%
Unallocated Corporate Overhead	1.432,0	1.453,0	1.525,0	1.112,0	1.100,0	1.170,0	1.396,0	1.306,0		
As % of revenue	*4,6%*	*4,7%*	*4,9%*	*3,9%*	*3,9%*	*4,1%*	*4,8%*	*4,3%*	0,2%	-0,4%
Depreciation & Amortization	2.570,0	2.553,0	2.533,0	2.341,0	2.298,0	2.301,0	2.330,0	2.351,0		
As % of revenue	*3,9%*	*3,8%*	*3,8%*	*3,7%*	*3,7%*	*3,6%*	*3,6%*	*3,5%*	0,4%	0,2%
Research & Development	552,0	665,0	718,0	754,0	760,0	737,0	680,0	711,0	included in Marketing	
As % of revenue	*0,8%*	*1,0%*	*1,1%*	*1,2%*	*1,2%*	*1,2%*	*1,1%*	*1,1%*	-0,2%	0,2%
Other Overhead	5.454,0	5.256,0	5.255,0	5.027,0	4.397,0	3.945,0	3.393,0	3.168,0	including software, pension, medical, bad debt, etc	
As % of revenue	*8,3%*	*7,9%*	*7,9%*	*8,0%*	*7,0%*	*6,2%*	*5,2%*	*4,7%*	3,6%	2,3%
Adjusted EBIT	9.231,0	9.815,0	9.673,0	9.787,0	9.855,0	10.344,0	10.179,0	10.372,0		
Adjusted EBIT Margin	*14,1%*	*14,8%*	*14,5%*	*15,5%*	*15,7%*	*16,3%*	*15,7%*	*15,4%*	1,3%	-0,5%
Amortization of Intangibles	119,0	110,0	92,0	75,0	70,0	68,0	69,0	81,0		
As % of revenue	*0,2%*	*0,2%*	*0,1%*	*0,1%*	*0,1%*	*0,1%*	*0,1%*	*0,1%*	0,1%	0,0%
EBIT	9.112,0	9.705,0	9.581,0	9.712,0	9.785,0	10.276,0	10.110,0	10.291,0		
EBIT margin	*13,9%*	*14,6%*	*14,4%*	*15,4%*	*15,6%*	*16,2%*	*15,6%*	*15,3%*	1,4%	-0,5%
EBIT as reported	9.112,0	9.705,0	9.581,0	9.712,0	9.785,0	10.276,0	10.110,0	10.291,0	adjusted for Venezuela Impairment	

4. Accounting

Pepsi applies a very conservative revenue recognition, which we like given the conservative nature of the business:

Revenue Recognition

We recognize revenue when our performance obligation is satisfied. Our primary performance obligation (the distribution and sales of beverage products and food and snack products) is satisfied upon the shipment or delivery of products to our customers, which is also when control is transferred. The transfer of control of products to our customers is typically based on written sales terms that do not allow for a right of return. However, our policy for DSD and certain chilled products is to remove and replace damaged and out-of-date products from store shelves to ensure that consumers receive the product quality and freshness they expect. Similarly, our policy for certain warehouse-distributed products is to replace damaged and out-of-date products. As a result, we record reserves, based on estimates, for anticipated damaged and out-of-date products.

Our products are sold for cash or on credit terms. Our credit terms, which are established in accordance with local and industry practices, typically require payment within 30 days of delivery in the United States, and generally within 30 to 90 days internationally, and may allow discounts for early payment.

We estimate and reserve for our bad debt exposure based on our experience with past due accounts and collectibility, write-off history, the aging of accounts receivable and our analysis of customer data.

Our policy is to provide customers with product when needed. In fact, our commitment to freshness and product dating serves to regulate the quantity of product shipped or delivered. In addition, DSD products are placed on the shelf by our employees with customer shelf space and storerooms limiting the quantity of product. For product delivered through other distribution networks, we monitor customer inventory levels.

As discussed in "Our Customers" in "Item 1. Business," we offer sales incentives and discounts through various programs to customers and consumers. Total marketplace spending includes sales incentives, discounts, advertising and other marketing activities. Sales incentives and discounts are primarily accounted for as a reduction of revenue and include payments to customers for performing activities on our behalf, such as payments for in-store displays, payments to gain distribution of new products, payments for shelf space and discounts to promote lower retail prices. Sales incentives and discounts also include support provided to our independent bottlers through funding of advertising and other marketing activities.

A number of our sales incentives, such as bottler funding to independent bottlers and customer volume rebates, are based on annual targets, and accruals are established during the year, as products are delivered, for the expected payout, which may occur after year-end once reconciled and settled. These accruals are based on contract terms and our historical experience with similar programs and require management judgment with respect to estimating customer and consumer participation and performance levels. Differences between estimated expense and actual incentive costs are normally insignificant and are recognized in earnings in the period such differences are determined. In addition, certain advertising and marketing costs are also based on annual targets and recognized during the year as incurred.

See Note 2 to our consolidated financial statements for further information on our revenue recognition and related policies, including total marketplace spending.

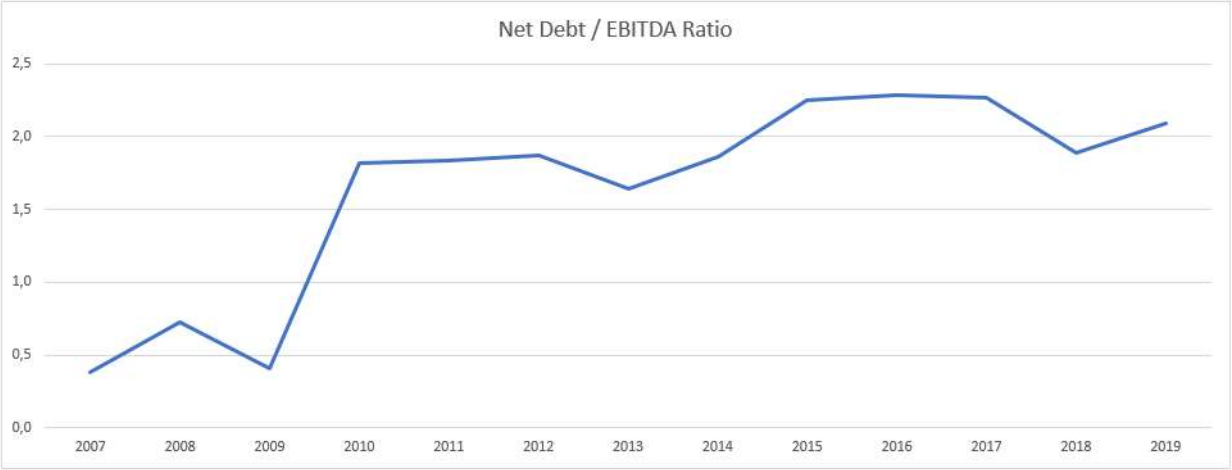
67

Source: Pepsi 2019 Annual Report p.67

There are no further particularly noteworthy accounting practices.

5. Net Debt / EBITDA Leverage

The company had very low Net Debt / EBITDA ratios of below 1,0 before the mergers in 2010. Since then, the Net Debt / EBITDA ratio was in the range of 1,6 and 2,3. This is still far from high leverage. Currently, the ratio is 2,1 which enables the company to conduct moderate M&A activity if attractive opportunities arise:



6. Merges & Acquisitions

The most recent example of how Pepsi uses its low Net Debt / EBITDA ratio and cash generative business is the Rockstar acquisition. On March 11th, 2020, Pepsi announced a USD 3,85bn offer for the energy drink company. This step is strategic insofar as the energy drink market is fast-growing and Rockstar is a troubled player behind Monster and Red Bull with catch-up potential. We find the merger sensible as PepsiCo can use its marketing competence to improve Rockstar brand awareness and subsequently sales.

For the details of the transaction please refer to:

https://www.ft.com/content/fe855b51-2f55-42be-b058-95afa954da73

Another recent PepsiCo acquisition is Hangzhou Haomusi Food Co., Ltd., a Chinese online snack company, for USD 705m. This step has been taken to strengthen Pepsi's position in China as well as to increase Pepsi's footprint in digital sales. The development towards digital sales is particularly interesting in our view, as this could lead to a multiple expansion in the long term.

IV. Management

Pepsi has a diverse management and board in culture, gender and race, and the company demonstrates significant awareness in ESG affairs. We see a certain negative correlation between ESG awareness and scandals which harm the image. Fittingly, Pepsi's last bigger image scandal

occurred in 2017 in relation to an advertisement with Kendall Jenner and Black Lives Matter. Pepsi reacted quickly, pulling the advertisement from the market after one day and apologizing immediately.

PepsiCo's CEO since October 2018 is Ramon Laguarta, a 24-year Pepsi veteran. He is directing the company towards accelerated growth and a new mission: "Winning with Purpose". Ramon is from Barcelona and was responsible for the company's business in Europe Sub-Saharan Africa, before taking on the global strategy. For a detailed career overview of Ramon Laguarta please refer to:

https://www.linkedin.com/in/ramonlaguarta/

His new strategic initiatives include more investment in marketing, innovation, and manufacturing capacity to sustainably grow the business at faster pace. He will also focus on cost saving to generate "productivity savings" of at least $1bn annually:

https://www.ft.com/content/8e60630c-3117-11e9-8744-e7016697f225

Overall, we have the feeling that Ramon understands his business well and that he is on a good way to adding value to the company.

Indra Nooyi is Ramon's predecessor. She joined Pepsi in 1994 and became CEO in 2006. During her 12 years as CEO, the company's sales grew by 80%:

https://www.cnbc.com/2018/09/12/pepsico-indra-nooyi-be-a-leader-people-want-to-follow.html

Hugh Johnston joined Pepsi in 1987 and has been the CFO since 2010. He also leads Pepsi's IT unit since 2015.

All in all, we find the top management and its history convincing.

V. Sales Channels

PepsiCo's products are primarily brought to market through direct-store-delivery (DSD, from Pepsi to retailer stores), customer warehouse (from Pepsi to retailers' warehouses) and distributor networks (schools, restaurants). From the end consumer's point of view, the products are available directly at e-commerce platforms (such as Amazon Pantry), B&M retailers, and gastronomy locations.

1. Trends in the Retail Landscape

The retail landscape is changing with rapid growth in sales through e-commerce, mobile commerce applications, subscription services and the integration of physical and digital operations among retailers. Pepsi continues to make significant investments in building global e-commerce and digital capabilities while being mindful in maintaining and developing successful relationships

with their key customers in the traditional retail channels. Pepsi's e-commerce sales accounted for USD 2bn in 2019. We expect this number to rise significantly in the coming years.

Another clear trend is the consolidation of retail ownership and purchasing power, which gives the ever-larger retailers more power to negotiate for more efficiency, promotional programs, and ultimately lower pricing. For this reason, we agree with Pepsi management, that the development of e-commerce capabilities is key for Pepsi staying ahead.

With regard to the customer structure we note that it is fragmented and that the largest customers are wholesalers and retailers. Walmart is by far PepsiCo's most important customer:

Company	% Pepsi Revenue	% Retailer COGS	Company Description
Walmart Inc	13,00%	2,21%	Walmart Inc. operates discount stores, supercenters, and neighborhood markets. The Company offers merchandise such as apparel, house wares, small appliances, electronics, musical instruments, books, home improvement, shoes, jewelry, toddler, games, household essentials, pets, pharmaceutical products, party supplies, and automotive tools. Walmart serves customers worldwide.
Kroger Co/The	2,74%	2,05%	The Kroger Co. operates supermarkets and convenience stores in the United States. The Company also manufactures and processes some of the foods that its supermarkets sell.
Costco Wholesale Corp	2,29%	1,13%	Costco Wholesale Corporation operates wholesale membership warehouses in multiple countries. The Company sells all kinds of food, automotive supplies, toys, hardware, sporting goods, jewelry, electronics, apparel, health, and beauty aids, as well as other goods.
Dollar General Corp	2,06%	7,90%	Dollar General Corporation operates a chain of discount retail stores located primarily in the southern, southwestern, midwestern, and eastern United States. The Company offer a broad selection of merchandise, including consumable products such as food, paper and cleaning products, health, beauty, pet supplies, and non-consumables such as seasonal merchandise.
Sysco Corp	1,61%	2,22%	Sysco Corporation distributes food and related products primarily to the foodservice industry. The Company also distributes personal care guest amenities, housekeeping supplies, room accessories, and textiles to the lodging industry. Sysco serves customers in the United States.
Koninklijke Ahold Delhaize NV	1,51%	1,81%	Koninklijke Ahold Delhaize N.V., through its subsidiaries, operates retail stores that offers food and non-food products in the United States and Europe. The Company manages supermarkets, convenience stores, compact hypers, pick-up points, and gasoline stations, as well as specialty stores which provides health and beauty care products, and wine and liquor.
Albertsons Cos Inc	1,40%	2,33%	Albertsons Companies, Inc. retails food products. The Company distributes fruits, vegetables, canned items, and other related goods. Albertsons Companies serves customers in the United States.
Carrefour SA	1,20%	1,21%	Carrefour operates supermarkets, hypermarkets, cash and carry stores, and e-commerce websites. The Company offers consumer goods, food and non-food products, household supplies, textiles, electronics, home appliances, and local products. Carrefour serves customers worldwide.
Target Corp	1,08%	1,06%	Target Corporation operates general merchandise discount stores. The Company focuses on merchandising operations which includes general merchandise and food discount stores and a fully integrated online business. Target also offers credit to qualified applicants through its branded proprietary credit cards.
Publix Super Markets Inc	0,99%	2,33%	Publix Super Markets, Inc. owns and operates a chain of supermarkets. The Company offers meats, seafood, dairy products, baked and goods, confectionery items, dry fruits, soft drinks, and alcoholic beverages, as well as pharmacy services. Publix Super Markets serves customers throughout the State of Florida, Georgia, Alabama, South Carolina, and Tennessee.
Tesco PLC	0,96%	0,85%	Tesco PLC, through its subsidiaries, operates as a food retailer. The Company offers online retailing, brick and mortar supermarkets, and a private-label brand of products. Tesco provides its services primarily throughout Europe, with additional activities in Asia.
Walgreens Boots Alliance Inc	0,76%	0,47%	Walgreens Boots Alliance, Inc., operates retail drugstores that offer a wide variety of prescription and non-prescription drugs as well as general goods. The Company also offers health services, including primary and acute care, wellness, pharmacy and disease management services, and health and fitness.

Source: Bloomberg Data

VI. Supply chain

The data we were able to access regarding Pepsi's suppliers was not complete. However, from the data we were able to access, we assume that Pepsi has a very diverse supplier structure. From what we found, there is no reason to believe that Pepsi is overly dependent from one particular supplier:

Company	Cost Department	% Cost of Pepsi	% Revenue of Supplier	Company Description	Comment
Amcor PLC	COGS	3,64%	9,01%	Amcor PLC operates as a packaging company. The Company offers wide range of flexible and rigid packaging, specialty cartons, closures, and services for food, beverage, pharmaceutical, and medical sectors. Amcor serves customers worldwide.	COGS - Packaging
McCormick & Co	COGS	1,80%	10,00%	McCormick & Company, Incorporated of Maryland manufactures, markets, and distributes flavor products including spices, herbs, extracts, seasonings, and flavorings and other specialty food products to the food industry. The Company sells to retail stores, food manufacturers, and food service businesses.	COGS - Raw Materials - Food
Crown Holdings Inc	COGS	1,52%	3,92%	Crown Holdings, Inc. designs, manufactures, and sells packaging products for consumer goods through plants located in countries around the world. The Company's primary products include steel and aluminum cans for food, beverage, household, and other consumer products. Crown also provides a variety of metal caps, closures, and dispensing systems.	COGS - Metal packaging
Hindalco Industries	COGS	1,26%	2,28%	Hindalco Industries Limited is an integrated aluminum producer and copper manufacturer. The Company engages in bauxite mining, alumina refining, coal mining, captive power plants and alumnium smelting to downstream rolling, extrusions, and foils. Hindalco Industries is based in India and operates internationally.	COGS - Metal packaging
Keurig Dr Pepper	COGS	1,25%	3,60%	Keurig Dr Pepper Inc. manufactures and distributes non-alcoholic beverages. The Company offers soft drinks, juices, teas, mixers, water, and other beverages. Keurig Dr Pepper serves customers in the United States, Canada, and Mexico.	COGS - Manufacturing
Ardagh Group SA	COGS	1,19%	5,67%	Ardagh Group S.A. manufactures containers and packaging products. The Company supplies glass and metal packaging products for beverages, pet food, seafood products, vegetables, oils, vinegars, condiments, and other consumer products. Ardagh Group serves customers worldwide.	COGS - Packaging (glass and metal)
O-I Glass Inc	COGS	0,90%	4,33%	O-I Glass, Inc. manufactures packaging products. The Company produces various types of glass bottles for food, beverage, cosmetics, and other related industries. O-I Glass serves customers worldwide.	COGS - Glass packaging
Ball Corp	COGS	0,86%	2,39%	Ball Corporation provides metal packaging for beverages, foods, and household products. The Company also supplies aerospace and other technologies and services to commercial and governmental customers. Ball serves customers worldwide.	COGS - Metal packaging
Owens-Illinois Inc	COGS	0,85%	3,54%	Owens-Illinois, Inc. manufactures glass packaging products. The Company produces glass containers for malt beverages, including beer and ready-to-drink low-alcohol refreshers, liquor, wine, food, tea, juice, and pharmaceuticals. Owens-Illinois sells its products to customers around the world.	COGS - Glass packaging

Source: Bloomberg Data

VII. Advertisement and Marketing

Advertising and marketing are key factors to PepsiCo's success. The company has launched numerous successful campaigns in the past and we are convinced that they have the capabilities to perform in this aspect. In this regard, Ram Krishan is of particular importance, who is the company's Global Chief Commercial Officer. To view his professional career in detail please view:

https://www.linkedin.com/in/ram-krishnan-9002b1/

In our view, the aspect of his professional career which stands out most is his proven experience in marketing and brand management. Combined with the company's strategic intention to further increase marketing spend, which becomes evident in following article,

https://www.ft.com/content/f746d28c-e5e6-11e9-9743-db5a370481bc,

PepsiCo is well positioned to continue increasing brand awareness and similarly increasing the prices of its products, thereby boosting margins and profitability. Note that Pepsi already has a history of advertisement expense increases and price increases, as can be seen in our prior analysis of their Income Statement.

To get a more concise idea of PepsiCo's commercials, please refer to:

https://www.youtube.com/results?search_query=pepsi+commercial

https://www.youtube.com/results?search_query=dorito+commercial+baby

Note that PepsiCo has a history of extremely entertaining commercials, which our Managing Director would even watch for mere entertainment, regardless of the brand. In fact, he even admits to occasionally do so in his free time...

This kind of commercials creates a high level of sympathy of consumers towards the brands.

VIII. Technical Analysis

While some asset managers and funds believe technical analysis to not be much of a trustworthy and valuable analysis method, we find that we are able to improve our market timing, at least marginally, when considering the price charts and respective indicators.

1. Distance in from ATH

At a current share price of USD 138,6, Pepsi trades 6% below the ATH. The ATH was at USD 147,20 on February 18th, 2020.

2. Long-term trend (5-10y)

Pepsi demonstrated a long-term bullish trend since 2009:

Source: Guidants Technical Analysis Tool

3. Short-term trend (1-12m)

The 1-year chart since October 2019 does not provide a trend. The price movement from January 2019 onwards shows a major support at roughly USD 105. Prices below mean a change in trend. We would need to reconsider our view on Pepsi in case of a monthly closing price below USD 105.

Currently, trading is range bound between USD 130 and USD 140. The price could recover to the ATH at USD 147,20 from February 18th, 2020.

The preferred entry price from an anticyclical, technical perspective is currently at USD 130. Procyclical entries are above USD 144 and ultimately above the past ATH at USD 147,20:

Source: Guidants Technical Analysis Tool

4. RSI, BB, EMA200 situation

The technical indicators are currently statistically normal. We suggest reconsidering at USD 130 at the potential arrival at the lower BB.

Source: Guidants Technical Analysis Tool

IX. Valuation Model Output

1. Assumptions and Data Input

We used our proprietary, multi-level DCF valuation model to determine PepsiCo's intrinsic value[1]. We expect revenues to grow between 3% and 5% per year in years until 2025. For the years 2026-2030 we expect revenue growth to return to the risk-free rate, which we assume at 1% in perpetuity. Based on current revenues, this results in a revenue of approximately USD 93bn in the terminal year after year 10.

PepsiCo currently has an operating margin of 14,74%. For 2020 we expect an operating margin of ca. 15%, which will gradually increase to roughly 17% by year 3, which is slightly above Pepsi's long-term average. The operating margin is assumed to remain at this level ad infinitum. Despite a possible increase due to regulatory changes, we use an effective tax rate of 21% in our model. The cost of capital of 5,79% resulting from the WACC method applied to years 2020-2025 and increases from year 6 to 6% in 2030. The current yield of 10y US Treasury Bonds, which is currently around 0,7%, was used as the current risk-free interest rate.

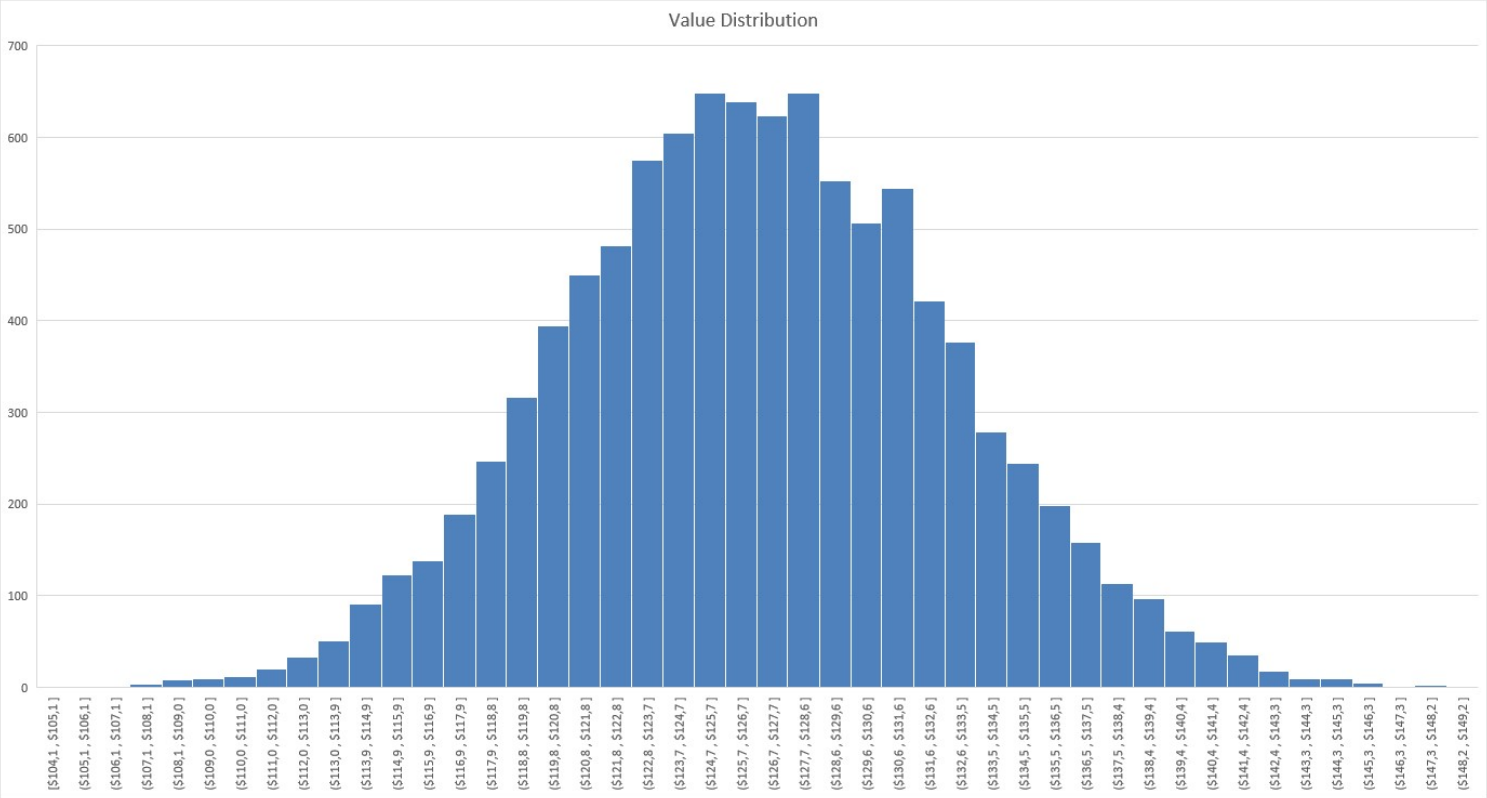
It is also assumed that PepsiCo is able to generate a return on capital of a mature company in the long run as competitive advantages fade. Due to PepsiCo's size and diversity of brands, the probability of bankruptcy is assumed at 0% and not factored into the valuation. After 2030, a risk-free interest rate of 1% is expected. This reflects the assessment that monetary policy will remain expansive over the foreseeable future. After 2030, the model prices in a growth rate that corresponds to the risk-free interest rate.

Our model considers employee option compensation and R&D as well as lease obligations. We compute WACC as a combination of industry and regional betas. Additionally, the model considers PepsiCo's current A2 Rating by Moody's and A rating by S&P Global Ratings.[2]

2. Model Output

The model yields a statistical value of equity distribution. Due to our underlying statistical assumptions, the result is close to normally distributed. We present the Monte Carlo Simulation result with sample size 10.000 below:

[1] We owe parts of the model to a renowned university professor from the US.
[2] As of 2020 Q3 report.



Based on our inputs, the current share price of USD 138 is overvalued with a cumulative probability of over 95%. At the current price levels on equity markets we do not find this particularly surprising. Additionally, analysts might assume lower risk-free rates in perpetuity, which would have a significant impact on the valuation output. The median and average of our model yields a share price of USD 126,6. So, currently, PepsiCo is overvalued by approximately 10%.

X. Risks

PepsiCo's valuation output would be negatively affected by a presidential election victory of Joe Biden. He wants to increase the corporate tax rate from 21% to 28%. In our valuation model, this would result in a significant reduction in the fair value per share from circa USD 126,5 to circa USD 114,3, a decrease of approximately 10%.

Another political development that could have a negative impact on PepsiCo is the trend to label unhealthy food as such and, above all, to impose additional taxes on it. PepsiCo would have to choose between passing on the costs of the tax completely to the customer or to receive a negative effect on its margins. A 20% increase in the price of soft drinks caused by a tax can reduce consumption of these sugary drinks by 20%:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3556391/

After the Mexican government first introduced a tax of around 10% on sugar-containing beverages in 2014, the price increase resulted in a 7,6% decline in the quantity consumed. At 11,7%, this decline was even disproportionately strong for the lowest-income households:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5442881/

To date, only a few countries in the world have introduced such a tax on a large scale. This could change in the wake of an increasingly overweight population combined with negative demographic trends. States will increasingly try to close their funding gaps in health care systems by imposing taxes on unhealthy products. If the number of soft drinks consumed declines in the process, the problem of increasingly common diabetes will also decline.

XI. Fundamental Investment Thesis

The Investment Thesis is based on three assumptions, mainly surrounding PepsiCo's financial resiliency.

1. Covid-19 a non-issue

We assume that Pepsi's business and financial performance will not be significantly affected by the Covid-19 crisis.

3. IRR Outlook

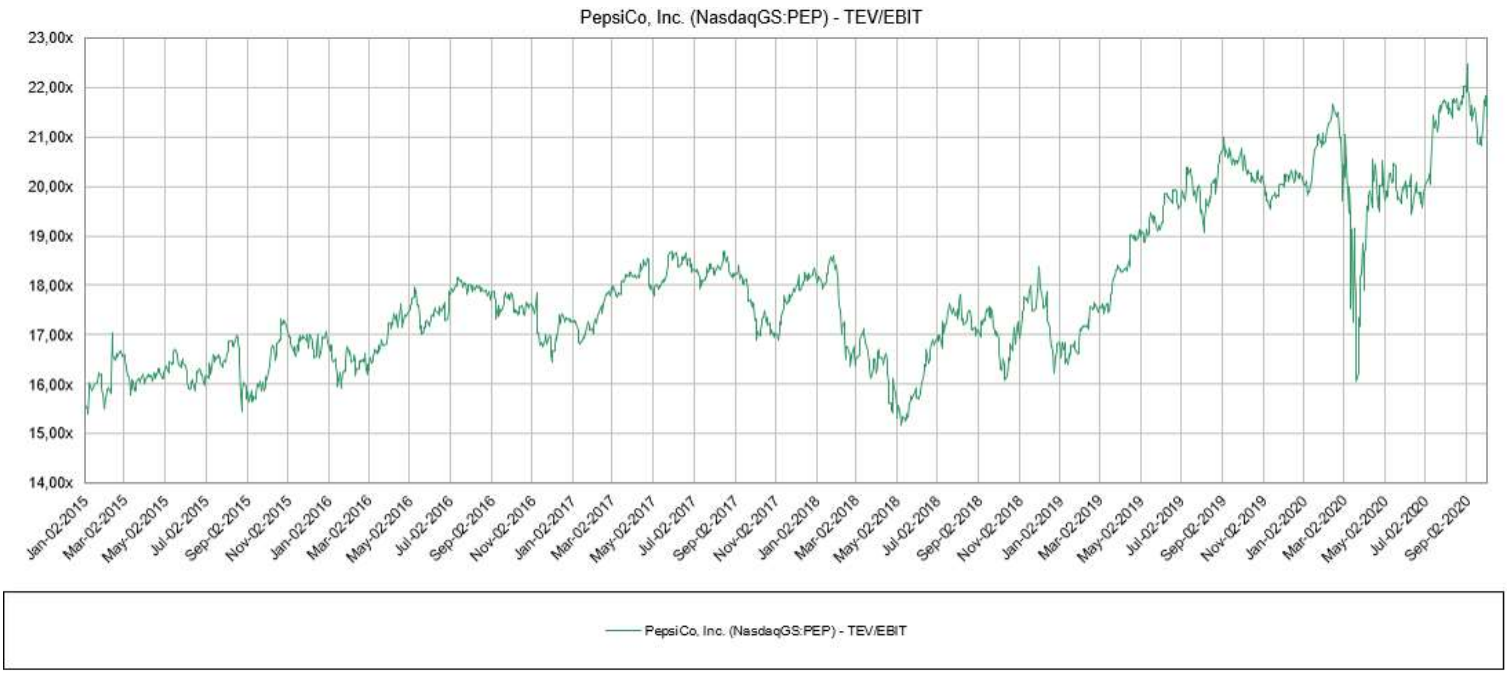
We expect PepsiCo to return over 10% per year in 2019-2024 ex multiple expansion. This is driven by organic and inorganic growth, dividend payouts and stock buybacks.

4. Multiple Expansion

At the current share price of USD 138, Pepsi trades at a 21,5x EBIT multiple. This is relatively high, however we expect the average multiple to rise over time due to e-commerce expansion and deepened understanding of how resilient Pepsi's business is.

4.1 Enterprise Value / EBIT

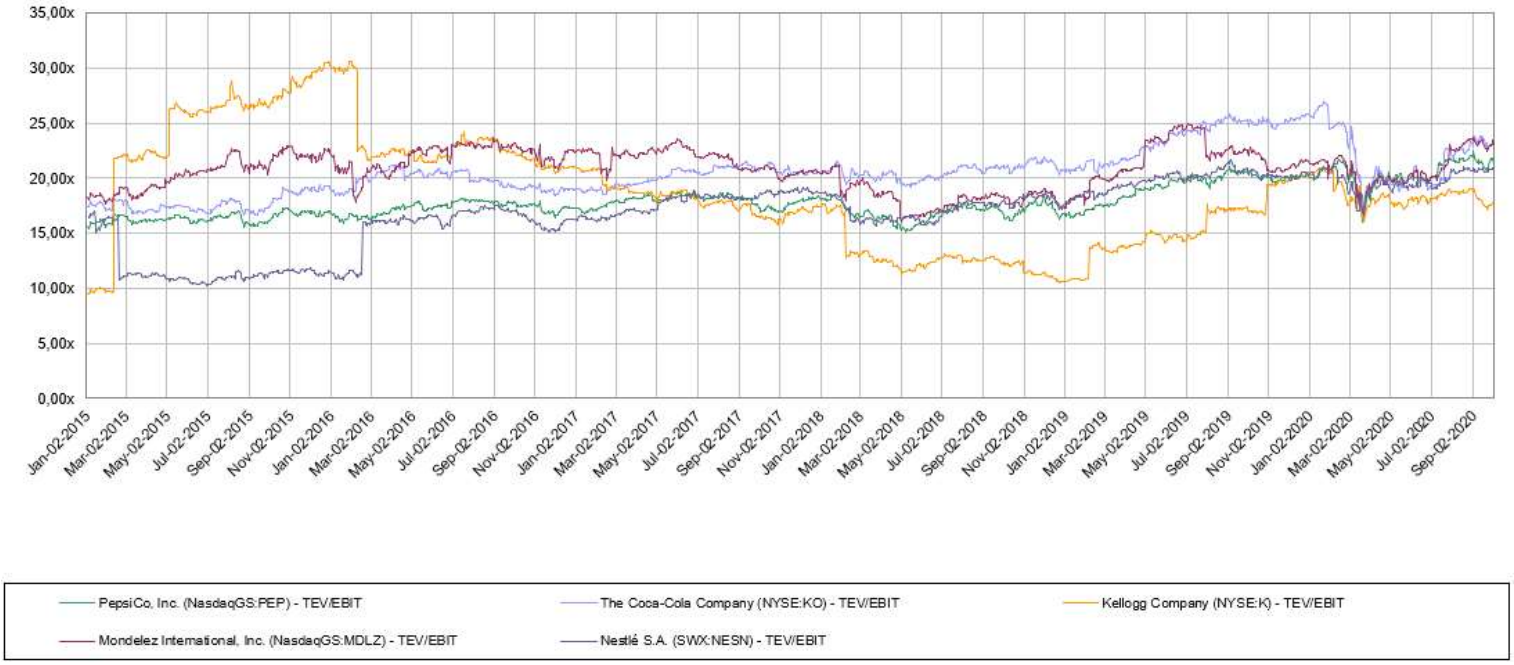
Pepsi's EBIT multiple expanded from 15,5x in 2015 to its current 21,5x level:

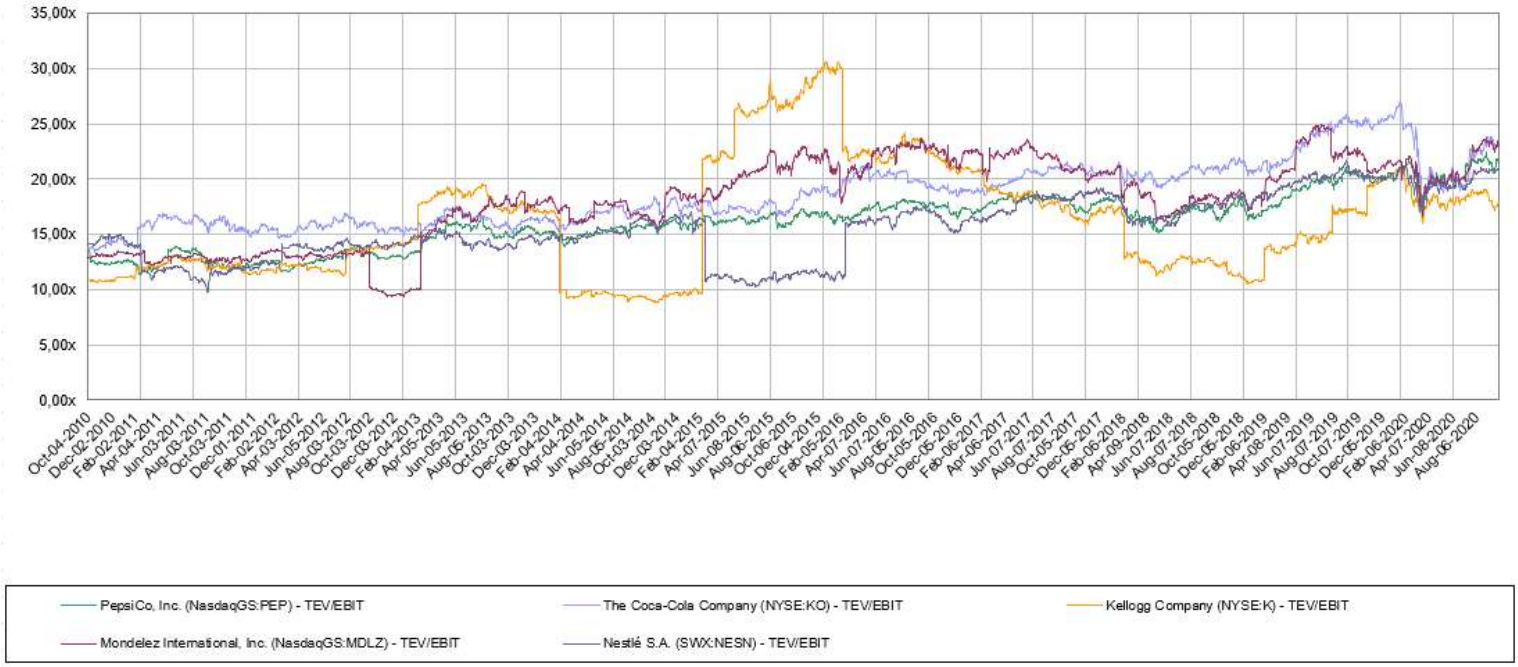


Source: Capital IQ Charts

4.2 Relative Valuation

Pepsi historically trades at a lower EBIT multiple than Coca-Cola, which is already an older company, and slightly above Nestlé. Arguably, Pepsi's closest Peer is Coca-Cola, and we believe that over time the multiples of these two companies will assimilate, leaving further space for multiple expansion by Pepsi:





Source: Capital IQ Charts

XII. Discussion of Fundamental Investment Thesis

1. Covid-19 non-issue

What we find impressive about Pepsi, is that they perform well in any market environment. Additionally, there is no fraud suspicion in this regard (recall Wirecard "performing well" in any market environment). As Pepsi has a long history of paying large amounts of cash dividends and performing stock buybacks, there is no reason not to believe that the business is extremely solid.

Arguably, as Pepsi addresses basic needs of consumers, i.e. food and drink, it is logical that consumers will cut these kind of expenses only as last resorts in case of budget constraints, which justifies why Pepsi performs relatively well in times of economic contractions.

Pepsi grew sales in 2008 with stagnating EBIT and grew EBIT with stagnating sales in 2009:

	2007	2008	2009	2010	2011	2012	CAGR
Revenue	39.474,0	43.251,0	43.232,0	57.838,0	66.504,0	65.492,0	10,7%
EBIT	7.182,0	6.959,0	8.044,0	8.332,0	9.633,0	9.112,0	
Intangibles Amortization	58,0	64,0	63,0	117,0	133,0	119,0	
Adjusted EBIT	7.240,0	7.023,0	8.107,0	8.449,0	9.766,0	9.231,0	
Adjusted EBIT Margin	*18,3%*	*16,2%*	*18,8%*	*14,6%*	*14,7%*	*14,1%*	

Pepsi Bottling M&A, and Wimm-Bill-Dann M&A, totalling $13,6bn

Similarly, the consensus forecast for 2020 is sales growth vs 2019:

https://www.marketscreener.com/quote/stock/PEPSICO-INC-39085159/calendar/

In our base case, we assume conservatively both reduced sales and EBIT in 2020, however by 2022E both sales and EBIT would be above 2019 levels. In our best case, we go with the consensus and expect sales growth 2020E vs 2019 and only slightly lower EBIT than in 2019:

Base Case

Revenue (in $ Millions)	**2019**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	**Assumptions**
Food and Snacks NA	19.560	20.898	21.733	22.603	23.507	24.447	4% growth
Beverages NA	21.730	21.251	21.676	22.109	22.551	23.002	2% growth
North America Total	41.290	42.148	43.409	44.712	46.058	47.450	
Europe	11.728	9.889	9.889	9.889	9.889	9.889	stagnation
Latin America	7.573	6.234	6.296	6.359	6.422	6.487	1% growth
Rest of World	6.570	6.353	6.480	6.609	6.742	6.876	2% growth
Total	**67.161**	**64.623**	**66.073**	**67.569**	**69.111**	**70.701**	
Operating Income (in $ Millions)	**2019**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	
Food and Snacks NA	5.802	6.123	6.411	6.781	7.193	7.628	
Beverages NA	2.179	1.504	1.734	1.769	1.804	1.840	
North America	7.981	7.627	8.145	8.550	8.997	9.468	
Europe	1.327	1.077	1.088	1.088	1.088	1.088	
Latin America	1.141	975	1.007	1.030	1.053	1.070	
Rest of World	1.148	1.135	1.166	1.190	1.213	1.238	
Corporate Unallocated	-1.306	-1.306	-1.306	-1.306	-1.306	-1.306	constant
Total	**10.291**	**9.508**	**10.101**	**10.551**	**11.046**	**11.557**	
Operating Margin	**2019**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	
Food and Snacks	29,7%	29,3%	29,5%	30,0%	30,6%	31,2%	
Beverages	10,0%	7,1%	8,0%	8,0%	8,0%	8,0%	
North America	19,3%	18,1%	18,8%	19,1%	19,5%	20,0%	
Europe	11,3%	10,9%	11,0%	11,0%	11,0%	11,0%	
Latin America	15,1%	15,6%	16,0%	16,2%	16,4%	16,5%	
Rest of World	17,5%	17,9%	18,0%	18,0%	18,0%	18,0%	
Total	15,3%	14,7%	15,3%	15,6%	16,0%	16,3%	

Best Case

Revenue (in $ Millions)	**2019**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	**Assumptions**
Food and Snacks NA	19.560	21.500	22.790	24.157	25.607	27.143	6% growth
Beverages NA	21.730	22.500	23.175	23.870	24.586	25.324	3% growth
North America Total	41.290	44.000	45.965	48.028	50.193	52.467	
Europe	11.728	11.000	11.220	11.444	11.673	11.907	2% growth
Latin America	7.573	7.500	7.725	7.957	8.195	8.441	3% growth
Rest of World	6.570	6.800	7.072	7.355	7.649	7.955	4% growth
Total	**67.161**	**69.300**	**71.982**	**74.784**	**77.711**	**80.770**	
Operating Income (in $ Millions	**2019**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	
Food and Snacks NA	5.802	6.200	6.709	7.256	7.845	8.479	
Beverages NA	2.179	1.700	1.854	1.957	2.065	2.178	
North America	7.981	7.900	8.563	9.214	9.910	10.657	
Europe	1.327	1.150	1.195	1.242	1.290	1.340	
Latin America	1.141	1.000	1.236	1.297	1.360	1.427	
Rest of World	1.148	1.135	1.273	1.346	1.423	1.504	
Corporate Unallocated	-1.306	-1.306	-1.267	-1.229	-1.192	-1.156	3% decrease p.a.
Total	**10.291**	**9.879**	**11.000**	**11.870**	**12.792**	**13.771**	
Operating Margin	**2019**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	
Food and Snacks	29,7%	28,8%	29,4%	30,0%	30,6%	31,2%	0,6% margin expansion p.a.
Beverages	10,0%	7,6%	8,0%	8,2%	8,4%	8,6%	recovery to 8% margin, then +0,2% p.a.
North America	19,3%	18,0%	18,6%	19,2%	19,7%	20,3%	
Europe	11,3%	10,5%	10,7%	10,9%	11,1%	11,3%	slight margin expansion +0,2% p.a.
Latin America	15,1%	13,3%	16,0%	16,3%	16,6%	16,9%	0,3% margin expansion after 2021
Rest of World	17,5%	16,7%	18,0%	18,3%	18,6%	18,9%	0,3% margin expansion after 2021
Total	15,3%	14,3%	15,3%	15,9%	16,5%	17,0%	

2. IRR 2019-2024 above 10% per year

We used our financial modelling to model the IRR of PepsiCo between 2019 and 2024E. In our base case, revenues grow with 1% p.a. and the EBITA margin expands by 1,1%. Additionally, net debt remains at USD 26bn – 28bn. We assume PepsiCo to buy back 1% of shares p.a. and to pay out 50% of adjusted EBIT as dividends. This yields a 10,4% IRR, which we assume to be conservative.

In our best case, Pepsi grows revenues by 3,8% p.a. until 2024 and expands the adjusted EBIT margin by 1,7%. Net financial debt grows by 1,5% per year due to slightly larger M&A activity, and the company buys back 1,5% of shares per year. Additionally, Pepsi increases the dividends to adjusted EBIT ratio gradually from 51% to 55%. This yields a 16,2% IRR, which is optimistic in our view.

Overall, we find somewhere in between realistic. We think that we can expect 13% return per year ex margin expansion from Pepsi over the coming years.

3. Multiple Expansion

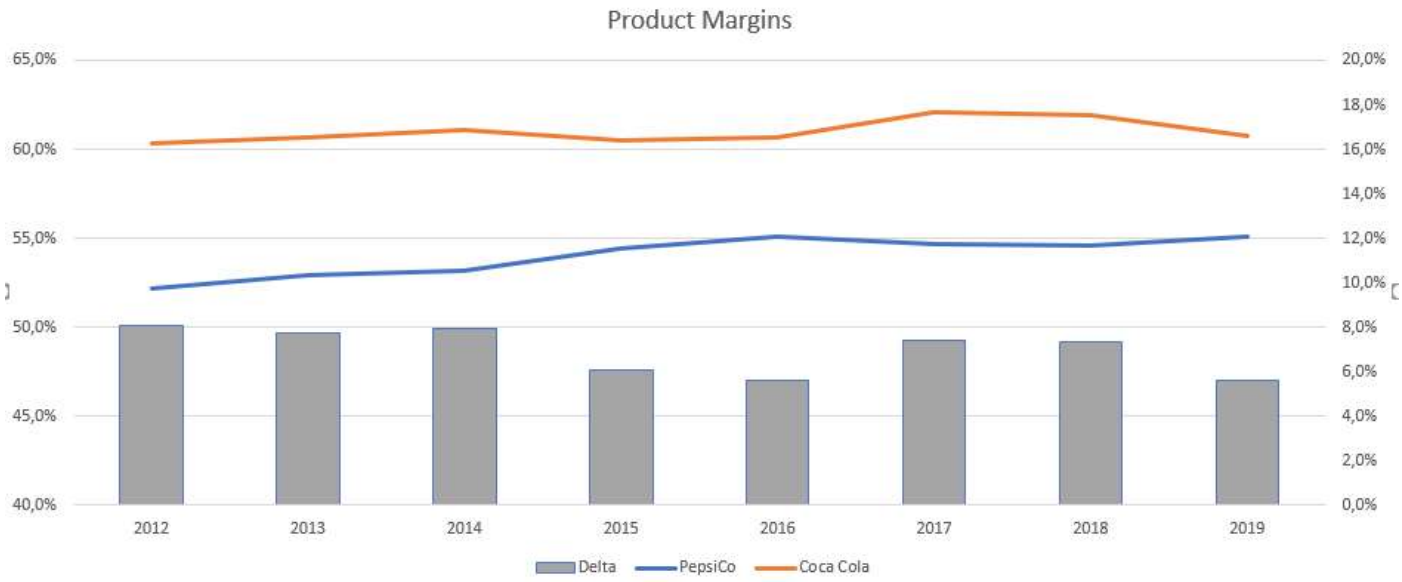
Buying Pepsi for 19,5x EBIT would be equivalent to a price of roughly USD 125 per share. We believe that Pepsi has potential to reach 25x EBIT in the next three years, driven by its digital ambitions and solid business model as well as proven crisis-resiliency. This is equivalent to a further 8,6% return per year.

Together with our 13% expected IRR, this yields a total of 21,6% expected return per year. Our target price for 2023 is consequently circa USD 220, calculated as expected EBIT * 25 / # of shares outstanding. To be precise, our base case model results in circa USD 205 and our best-case model results in circa USD 240 per share.

XIII. Comparison with peer Coca-Cola

1. Product Margin

Pepsi's main peer is Coca-Cola and therefore we compare the product margins of these two companies over time. We observe that Coca Cola outperforms Pepsi Cola in this criterion, however, Pepsi is catching up:

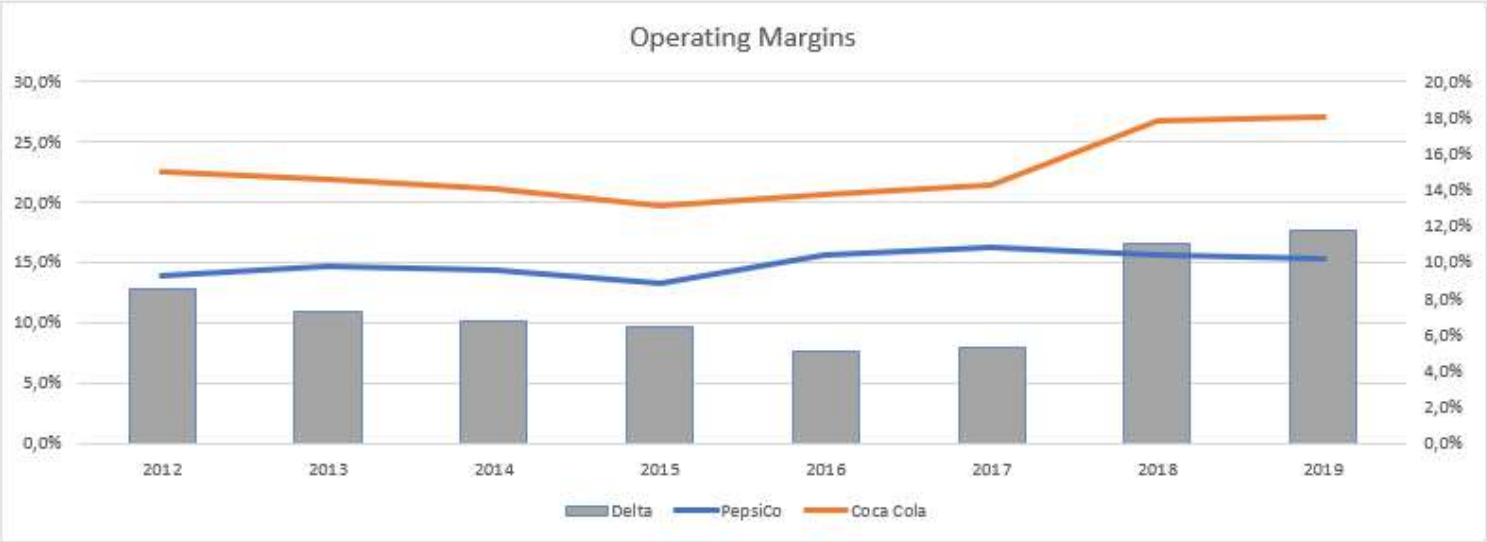


2. Operating Margin

With respect to the operating margin, Coca Cola also outperforms Pepsi and has currently been able to increase its operating margin significantly. However, Coca Cola's sales have been falling, giving the impression that Coca Cola is focusing on its core business while PepsiCo is still

expanding. Nevertheless, we hope that PepsiCo is able to improve its operating margin over the coming years as this has been a weak point since 2017:

	Fiscal Year	2012	2013	2014	2015	2016	2017	2018	2019
PepsiCo	Revenue in $m	65.492,0	66.415,0	66.683,0	63.056,0	62.799,0	63.525,0	64.661,0	67.161,0
	Revenue Growth		*1,4%*	*0,4%*	*-5,4%*	*-0,4%*	*1,2%*	*1,8%*	*3,9%*
	Operating Profit in $m	9.112,0	9.705,0	9.581,0	8.353,0	9.785,0	10.276,0	10.110,0	10.291,0
	Operating Margin	*13,9%*	*14,6%*	*14,4%*	*13,2%*	*15,6%*	*16,2%*	*15,6%*	*15,3%*
Coca Cola	Revenue in $m	48.017,0	46.854,0	45.998,0	44.294,0	41.863,0	36.212,0	34.300,0	37.266,0
	Revenue Growth		*-2,4%*	*-1,8%*	*-3,7%*	*-5,5%*	*-13,5%*	*-5,3%*	*8,6%*
	Operating Profit in $m	10.779,0	10.228,0	9.708,0	8.728,0	8.626,0	7.755,0	9.152,0	10.086,0
	Operating Margin	*22,4%*	*21,8%*	*21,1%*	*19,7%*	*20,6%*	*21,4%*	*26,7%*	*27,1%*
Delta		8,5%	7,2%	6,7%	6,5%	5,0%	5,2%	11,0%	11,7%



XIV. Ownership

As of October 2nd, 2020, the company has total insider holdings of 0,14% which is equivalent to USD 268m. The CEO holds 268.863 shares worth a total of USD 38m at the current price. As of July 16th, 2020, and CFO holds 223.033 shares worth USD 31m. Arguably, these men have long-term interests which are well aligned with those of other shareholders. The company has further 11,6m share options outstanding with an average exercise price of USD 89 as of 2019.

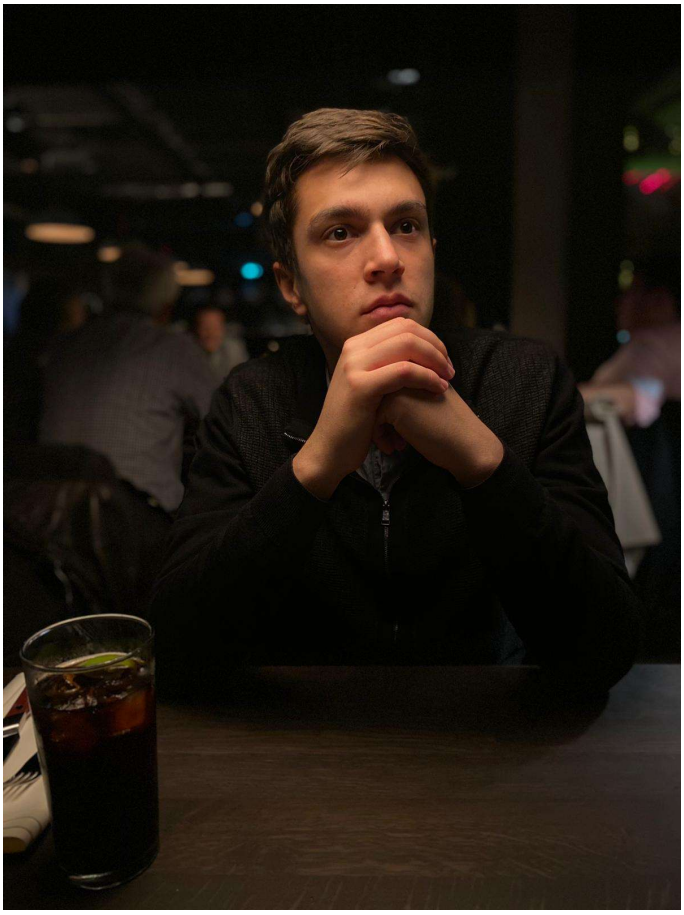
Institutional investors hold 73,53% of the shares as of June 2020. Notable institutional investors (besides the typical ETF institutions) are Geode Capital Management (1,5% ownership), Wellington Management (1,4% ownership) and Fidelity (1,0% ownership).

XV. Conclusion

We will open a position in PepsiCo in case of a setback. We will trade in tranches. An initial position will be opened in the USD 130 range. We intend to reach our desired position size if the stock falls to roughly USD 125. Alternatively, we will open a smaller, momentum-driven position in case of a breakout scenario. We will probably only trade into a Pepsi exposure after the election, which we expect to bring an increased level of volatility into the market.

XVI. Personal Remarks

Dear reader,



as founder and Managing Director of FS Associates, I cannot sufficiently emphasize how proud I am of the exceptional team which stands behind the extensive research and work involved in the creation of this investment report. It is my exceptional pleasure to work with this carefully selected and trained team. Since founding this initiative in the summer of 2019, much was achieved. We have faced challenges and setbacks. However, as a committed and goal-oriented team we were able to weather the storms. This report as well as future reports is the product of a continued learning experience. We are thankful for Frankfurt School, which supports us and our work by providing funds and a unique working environment for dedicated and motivated students.

To you, dear reader, it remains for me and my team to hope that you enjoyed reading this report as much as we enjoyed writing and researching it. I think we all deserve a Pepsi now…

Yours faithfully,

Quirin Zundl

Quirin Zundl, Managing Director

XVII. Disclaimer

This report has been prepared by Frankfurt School Associates ("FS Associates"). Each such report specifies the publisher and owner of that report. All our reports are for informational purposes only and presented "as is" with no warranty of any kind, express or implied. Under no circumstances should any of these reports or any information herein be interpreted or used as investment advice, or understood as an offer to sell or the solicitation of an offer to buy any securities or other financial instruments. FS Associates publishes research reports on publicly traded securities. The reports are the property of FS Associates. The opinions, information and reports set forth herein are solely attributable to FS Associates.

By downloading, accessing, or viewing any research report, you agree to the following Terms of Use. You agree that use of the research presented in any report is at your own risk. You (or any person you are acting as agent for) agree to hold harmless FS Associates, their affiliates and related parties, including, but not limited to any members, partners and managers (collectively, the "FS Associates Related Persons") for any direct or indirect losses, including trading losses, attributable to any content in a research report. You further agree to do your own research and due diligence before making any investment decision with respect to securities of the company covered herein (each, a "Covered Company") or any other financial instruments that reference the Covered Company or any securities issued by the Covered Company.

You represent that you have sufficient investment sophistication to critically assess the information, analysis and opinion presented in any FS Associates report. You further agree that you will not communicate the contents of reports and other materials made available by FS Associates to any other person unless that person has agreed to be bound by these Terms of Use. If you access, download or receive the contents of FS Associates reports or other materials on your own behalf, you agree to and shall be bound by these Terms of Use. If you access, download or receive the contents of FS Associates reports or other materials as an agent for any other person, you are binding your principal to these same Terms of Use. As of the publication date of a FS Associates report, FS Associates Related Persons, possibly along with or through its members, partners and managers, have a position (long or short) in one or more of the securities of a Covered Company (and/or options, swaps, and other derivatives related to one or more of these securities), and therefore may realize significant gains in the event that the prices of a Covered Company's securities decline or appreciate.

FS Associates Related Persons may continue to transact in Covered Companies' securities for an indefinite period after an initial report on a Covered Company, and such position(s) may be long, short, or neutral at any time hereafter regardless of their initial position(s) and views as stated in the research report. Neither FS Associates nor FS Associates Related Persons are required to update any report or information to reflect changes in positions that may be held by FS Associates Related Persons. This is not an offer to sell or a solicitation of an offer to buy any security. Neither FS Associates nor any FS Associates Related Person are offering, selling or buying any security to or from any person through any FS Associates research reports. FS Associates is affiliated with Frankfurt School of Finance & Management and does not trade real-money securities. FS Associates does not render investment advice to anyone. You understand and agree that FS Associates does not have any investment advisory relationship with you or does not owe fiduciary duties to you. Giving investment advice requires knowledge of your financial situation, investment objectives, and risk tolerance, and neither FS Associates nor FS Associates Related Persons have such knowledge about you.

The research and reports made available by FS Associates express the opinion of FS Associates and its Related Persons as of the time of the report only. Reports are based on generally available information, field research, inferences and deductions through the applicable due diligence and analytical process. To the best of the applicable FS Associates' ability and belief, all information contained in any of our reports is accurate and reliable, is not material non-public "insider" information, and has been obtained from public sources that the FS Associates believes to be accurate and reliable, and who are not insiders or connected persons of the Covered Companies or who may otherwise owe a fiduciary duty, duty of confidentiality or any other duty to the Covered Company (directly or indirectly). However, such information is presented "as is," without warranty of any kind, whether express or implied.

With respect to research reports, FS Associates makes no representation, express or implied, as to the accuracy, timeliness, or completeness of any such information or with regard to the results to be obtained from its use. Further, any research report contains a very large measure of analysis and opinion. All expressions of opinion are subject to

change without notice, and FS Associates does not undertake to update or supplement any reports or any of the information, analysis and opinion contained in them. In no event shall FS Associates or any FS Associates Related Persons be liable for any claims, losses, costs or damages of any kind, including direct, indirect, punitive, exemplary, incidental, special or, consequential damages, arising out of or in any way connected with any information presented in any FS Associates report. This limitation of liability applies regardless of any negligence or gross negligence of FS Associates or any FS Associates Related Persons. You accept all risks in relying on the information presented in any FS Associates report. You agree that the information in any FS Associates research report is copyrighted, and you therefore agree not to distribute this information in any manner without the express prior written consent of FS Associates. If you have obtained FS Associates research reports in any manner other than as provided to you by FS Associates or FS Associates Related Persons, you may not read such research without agreeing to these Terms of Use. FS Associates research reports may contain "forward-looking" information, statements or estimates which are not entirely historical in nature. Reliance on such information, statements, estimates or projections are at the sole discretion of the reader. Past performance is no guarantee of future results.

XVIII. Risikohinweis und Haftungsausschluss

Die auf der Webseite von FS Associates und anderen Seiten, insbesondere sozialen Medien wie Twitter, Instagram und LinkedIn, dargestellten Transaktionsaktivitäten bzw. Kommentare zur Markteinschätzung von FS Associates und zugehörigen Personen enthalten keine Anlageberatung oder Anlageempfehlung und stellen keine Aufforderung zum Erwerb oder Verkauf von Wertpapieren oder Finanzprodukten dar. FS Associates haftet nicht für Schäden, die auf Inhalte unserer Webseite oder verwandter Seiten zurückgeführt werden könnten. Insbesondere übernehmen wir keine Gewähr hinsichtlich Korrektheit und Vollständigkeit der dargestellten Inhalte.

Alle Inhalte sind nicht nach den gesetzlichen Vorschriften für Finanzanalysen erstellt worden und sind nicht auf individuelle Gegebenheiten und Bedürfnisse von einzelnen Lesern ausgerichtet. Insbesondere sind weder Risikobereitschaft noch finanzielle Verhältnisse des einzelnen Lesers berücksichtigt. Alle Inhalte sind somit als reine Hintergrund- bzw. Marketinginformationen von FS Associates zu verstehen. FS Associates untersagt die unautorisierte Vervielfältigung bzw. Veröffentlichung der auf unserer Webseite und verwandten Seiten dargestellten Inhalte.