

# Factor Research: pb

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## 1 Data

### 1.1 Time period

2000.1.31 – 2020.6.30. The SHARADAR data source has a fixed 20 years window. We regularly download data from there to our local in an accumulation manner so we would go beyond the 20 years limit.

### 1.2 Universe

We manually re-construct historical SP500 line-up as our universe. So this research by nature is large-cap oriented

### 1.3 Data preparation

Our fundamental analysis is based on a quarterly rebalance frequency, which also matches the reporting period of companies. Our rebalance dates are the last dates of each quarter. Given the different earning dates of different company, at those dates, some companies latest financial reports may have not come out yet. So directly using the rebalance date as the date for the fundamental information would cause look-forward bias. To address this, at each rebalance date, we use the most recent financial information prior to that date for each companies.

## 2 Methodology

### 2.1 Z Score

At each rebalance date, we rank the above-mentioned universe by the relevant column/factor (pb in this case). We take the z-score of the rank. We also group the universe by sector/industry to examine the z score of stocks in each group.

Note as a classical constituent of value factor, a low pb value indicates a more value-styled stock as a high pb means a more growthy stock

## 2.2 IC

We calculated the IC as the Spearman correlation between the rank of PB ratio and the forward 1 month return. We also smooth the IC series to rolling 12 month average.

## 2.3 L/S Portfolio

TBA

# 3 Observation

## 3.1 Z Score

Figure 1 shows the overview of all sectors. We break them down into the following categories:

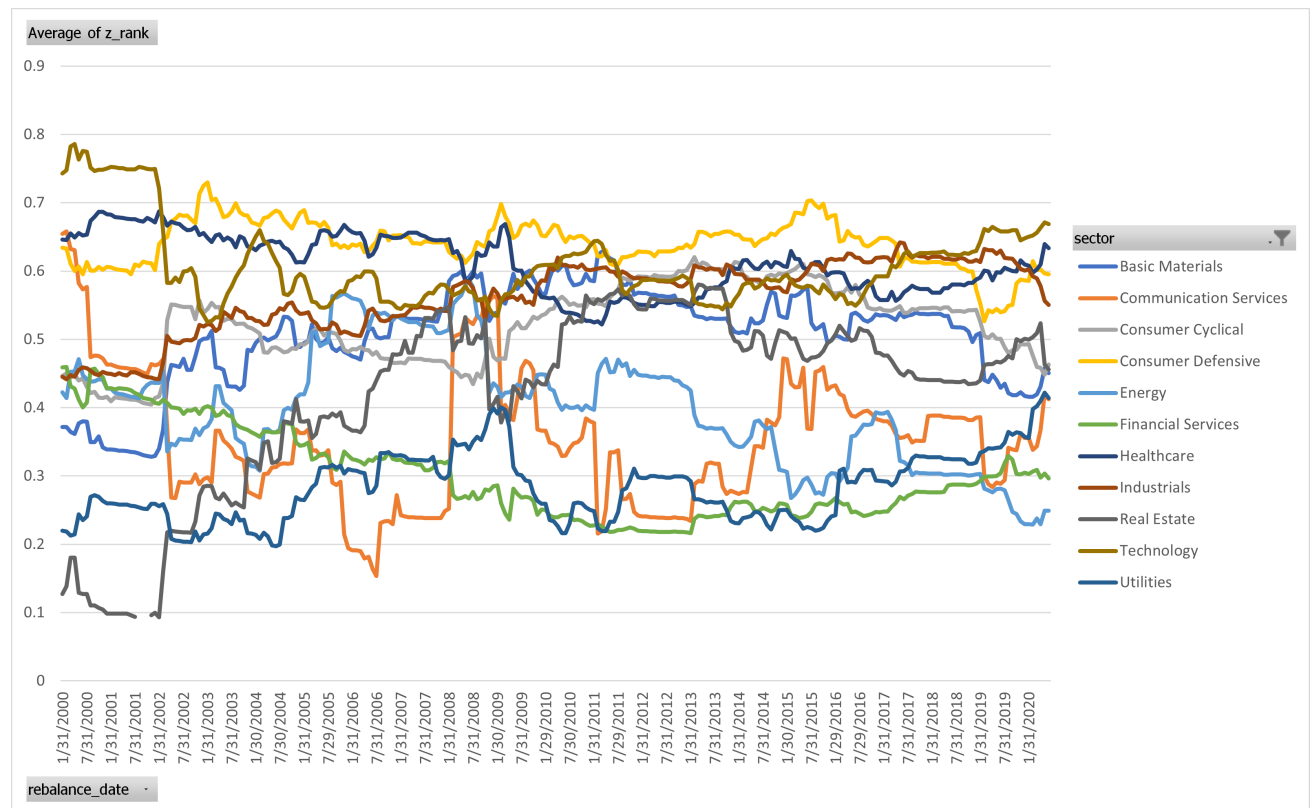


Figure 1: Average pb z score by each sector

- Sectors of high z scores ( $> 0.5$ )

As shown in Figure 2, **Technology**, **Healthcare**, **Consumer Defensive** and **Consumer Cyclical** are sectors of consistent high pb ranks historically. Among

them, **Technology**, **Healthcare** are the classical growthy sectors. For **Consumer Defensive** and **Consumer Cyclical**, we took a deeper look into the individual stocks in those sectors.

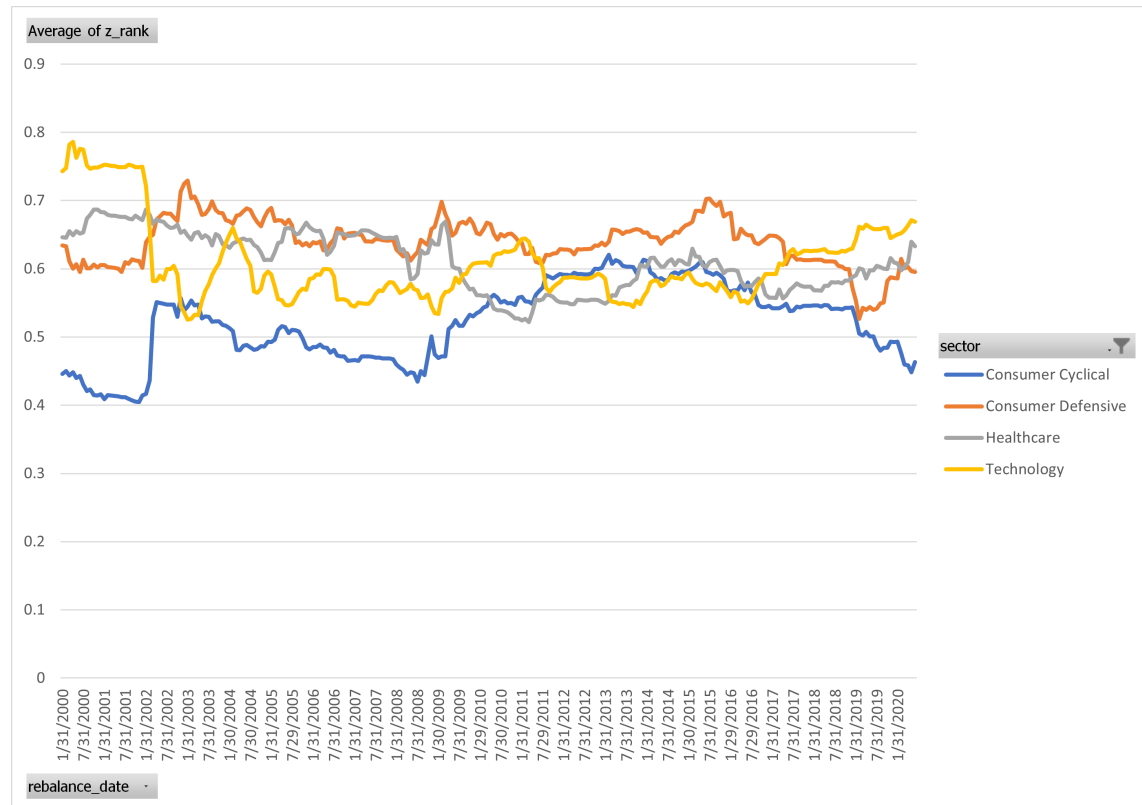


Figure 2: Sectors of high historical z-scores

- Sectors of low z scores ( $< 0.5$ )

As shown in Figure 3, **Financials** and **Utilities** have a consistent low pb rank historically. This reflects their nature as traditional value sectors.

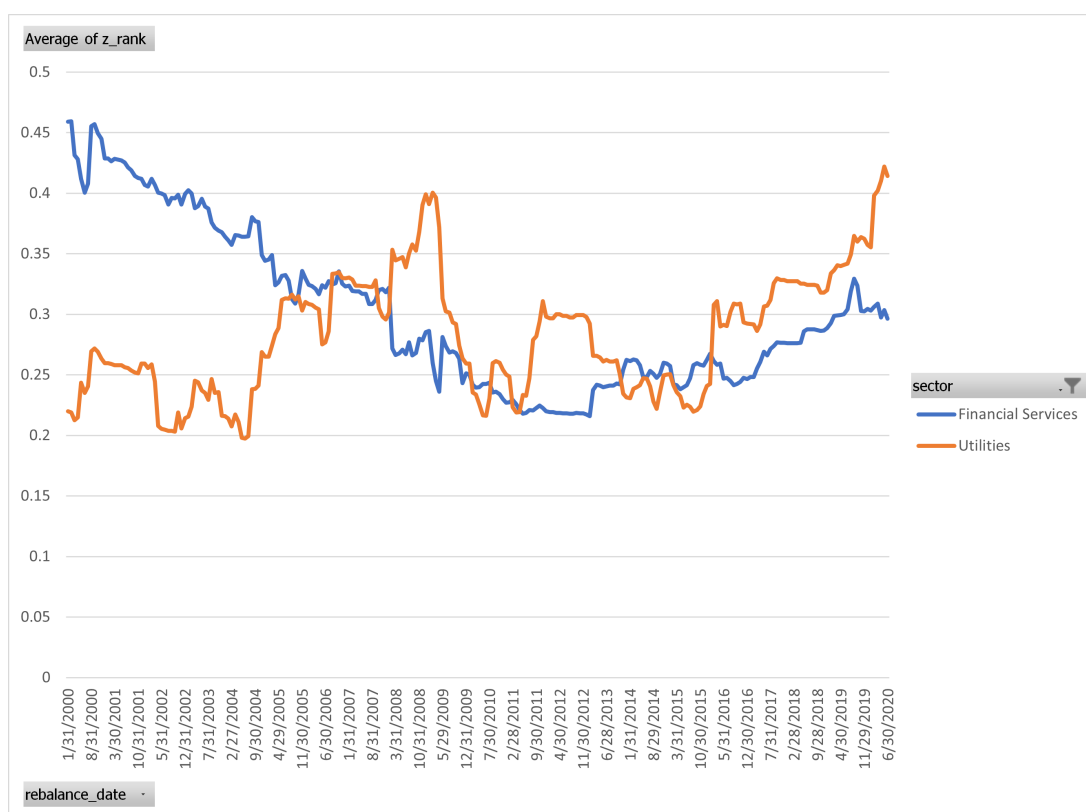
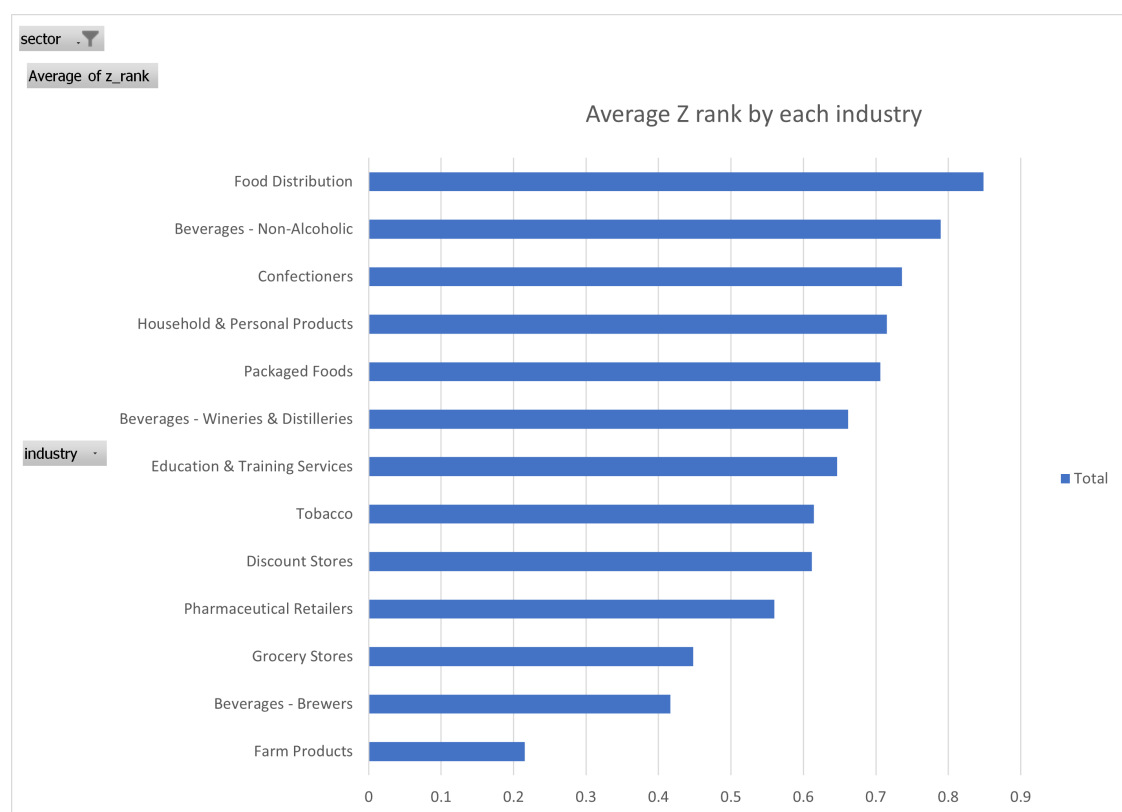


Figure 3: Sectors of low historical z-scores

## 3.2 Sector Investigation

### 3.2.1 Consumer Defensive

We started by looking at each industry.



The Food Distribution only has one company (in our universe) – SYM, Sysco. As shown in Fig-4. This company becomes very growthy since 2019 as P/B, P/E etc. ratios took off. Part of the reason according to Fig-?? is the drastic decline in its earning – -88.1%. However, its stock price only tank -21.3%. This would make PE ratio relative higher than the historical average. **However, we are not able to justify its high PB ration prior to 2019.**

#### Peer Comparison Ratios

All values are for the last fiscal year unless otherwise noted.

Company Name (Ticker Symbol)	P/E (9/25/20)	High P/E	Low P/E	PEG Ratio	Price to Earnings
Sysco Corporation (SY Y)	163.2	226.3	68.4	-3.1	Current Peer Values SY Y 130.1
US Foods Holding Corp (USFD)	NA	-303.3	-59.4	1.2	PGFC 28.9
Colabor Group Inc (COLF)	12.4	25.2	8.1	NA	SPIN -
Performance Food Group Co (PFGC)	NA	-67.3	-9.1	-10.3	COLF -
SpartanNash Co (SPTN)	11.7	17.5	6.6	-1.7	CHEF -
Chefs' Warehouse Inc (The) (CHEF)	NA	-75.7	-6.6	0.5	

High and Low P/E are for trailing twelve months using diluted EPS excluding extraordinary items. PEG ratio is historical.



#### Valuation

Line charts below give a 5 year history for SY Y and up to 5 peers.

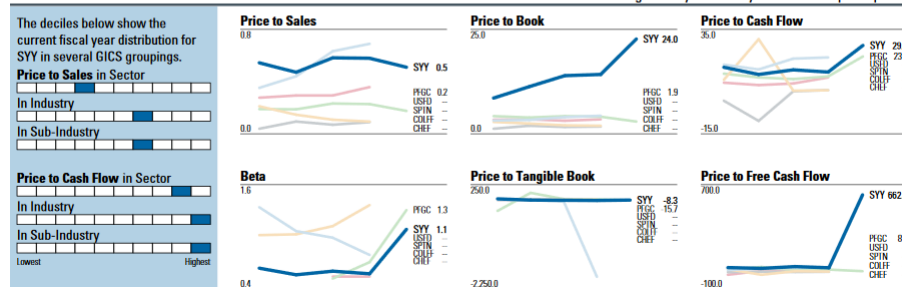


Figure 4: Valuations of SY Y as of 9/25/2020

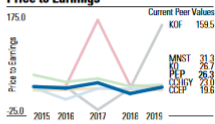
#### Sysco Corporation NYSE: SY Y

Price Performance		Key Statistics (Latest 4 Quarters)	
Price on 9/25/20	\$62.01	EPS Growth	-88.1%
52-Week High/Low	\$85.98 / 26.00	EPS Growth 3 Year, annualized	-41.3%
Volume on 9/25/20	2,543,564	EPS Growth 5 Year, annualized	-18.2%
10-Day Avg. Volume	3,487,094	Sales Growth	-42.7%
Price 1 Month Ago	\$61.89	Asset Turnover	2.6x
1 Month Price Performance	0.2%	Inventory Turnover	12.3x
Price 3 Months Ago	\$52.30	Receivables Turnover	13.7x
3 Month Price Performance	18.6%	Effective Tax Rate	26.6%
Price 6 Months Ago	\$50.45	Total Debt to Equity	556.6x
6 Month Price Performance	22.9%	Interest Coverage	1.5x
Price 12 Months Ago	\$78.80	Quick Ratio	0.9x
12 Month Price Performance	-21.3%	Current Ratio	1.5x
Market Capitalization	\$31.5 Billion	Payout Ratio	428.6%
Beta	1.10	Debt to Capital	0.8x

Figure 5: Key statistics of SY Y as of 9/25/2020

For Beverages - Non Alcoholic sector, we took Pepsi Co (PEP) as an example. From Fig-6 we can see that during the past one year, the valuation measures of PEP are fairly stable. However, from Fig-7 we observed that its Debt to Capital ratio is relatively high 0.7x. As the book values is the net equity of the company, we wonder the high leverage causes the company's equity value relatively small and eventually leads to a higher PB ratio. We also found the similar pattern in SY Y (0.8x debt ratio). **To validate our assumption that high leverage would inflate the PB ratio, we can examine**

the P/EV ratio which also considers companies liabilities. This would be the next topic of our factor research.

Peer Comparison Ratios					Price to Earnings
Company Name (Ticker Symbol)	P/E (9/24/20)	High P/E	Low P/E	PEG Ratio	
PepsiCo Inc (PEP)	26.9	30.1	20.7	4.3	
Coca-Cola Co (The) (KO)	23.0	28.4	17.1	2.3	
Coca-Cola Femsa SAB De CV (KOF)	129.7	211.3	121.7	-3.5	
Monster Beverage Corp (MNST)	36.6	40.9	23.5	1.6	
Coca-Cola European Partners Plc (CCEP)	NA	NA	NA	1.0	
Coca-Cola HBC AG (CCHGY)	NA	NA	NA	1.6	

All values are for the last fiscal year unless otherwise noted.  
High and Low P/E are for trailing twelve months using diluted EPS excluding extraordinary items. PEG ratio is historical.

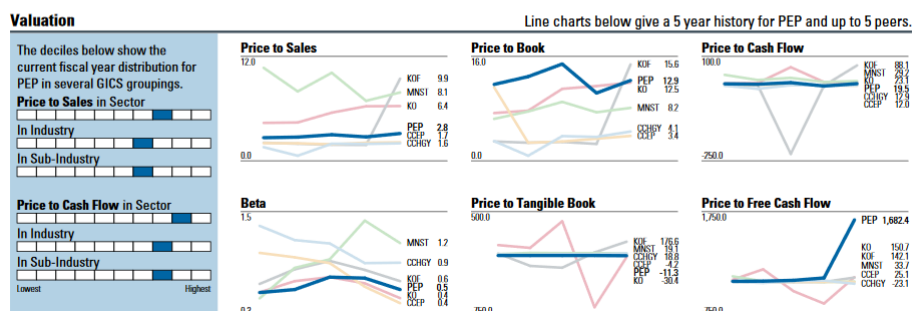


Figure 6: Valuations of PEP as of 9/25/2020

## PepsiCo Inc NASDAQ: PEP

Price Performance		Key Statistics (Latest 4 Quarters)	
Price on 9/24/20	\$131.58	EPS Growth	-45.8%
52-Week High/Low	\$147.20 / 101.42	EPS Growth 3 Year, annualized	6.0%
Volume on 9/24/20	4,316,594	EPS Growth 5 Year, annualized	4.0%
10-Day Avg. Volume	4,719,625	Sales Growth	-3.1%
Price 1 Month Ago	\$138.40	Asset Turnover	0.8x
1 Month Price Performance	-4.9%	Inventory Turnover	7.4x
Price 3 Months Ago	\$131.41	Receivables Turnover	8.0x
3 Month Price Performance	0.1%	Effective Tax Rate	21.2%
Price 6 Months Ago	\$120.26	Total Debt to Equity	280.5x
6 Month Price Performance	9.4%	Interest Coverage	NA
Price 12 Months Ago	\$135.36	Quick Ratio	0.8x
12 Month Price Performance	-2.8%	Current Ratio	1.0x
Market Capitalization	\$182.2 Billion	Payout Ratio	83.6%
Beta	0.53	Debt to Capital	0.7x

Figure 7: Key statistics of PEP as of 9/25/2020

### 3.2.2 Consumer Cyclical

TBA

### 3.3 IC

From Fig 8 we observed that since the mid of 2007, pb has a positive IC ration in the majority of periods. As a high PB means a growthy style, this exhibits a 10-year growth rally. Especially since July of 2017, high pb rank is consistently outperforming. There are some exception period where low PB outperforms buy they do not sustain. The longest period is between March 2012 to March 2013.

We would conduct follow up research to find potential causes on what make/stop high pb working.

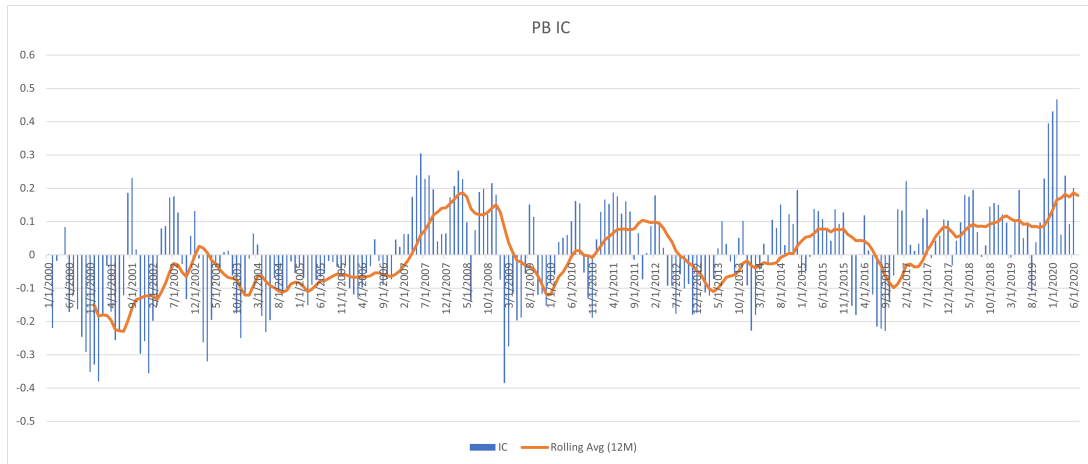


Figure 8: Time series of IC from 2000/01/31 to 2020/07/31

### 3.4 L/S Portfolio

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