

# Robustness Test of Value Investing Theory in Media Company Stock

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**Abstract:** This paper checks the robustness of Value Investing, which is widely used by Warren Buffett, Benjamin Graham and David Dodd. Enterprise Value Multiples and Equity Value Multiples are applied to comparison. Media companies in U.S., China, Japan and France are analysed from Oct. 8th, 2019 to Dec. 31st, 2020. Empirical results show 1) value investing is alive in media stocks; 2) compared with other ratios, PEG can provide a more accurate evaluation of stocks.

## 1. Introduction

Value investing is an investment strategy that involves picking stocks that appear to be trading for less than their intrinsic or book value. In empirical finance, Warren Buffett is the best-known value investor today, but there are many others, including Benjamin Graham (Buffet's professor and mentor), David Dodd, Charlie Munger, Christopher Browne (another Graham student), and billionaire hedge-fund manager Seth Klarman.

As one of the most important modern investment theories, value investing has been applied in stock markets in different countries. For example, Sun Mei and Liu Yaping study different industries in China and concluded that value investment is applicable in China [1]. Even when the economic crisis comes, value investment shows a strong momentum. Wang Li and Gu Jisheng show that the value investment strategy is not only applicable to foreign mature markets [2], but also to Asian emerging markets including China's stock market.

Besides, value investing is applied not only in different countries but also in different industries. For example, Li Cunhua and Wang Zhiqing proposed that there are significant differences in the financial investment value of China's A-share high-tech manufacturing companies, which is basically consistent with intrinsic value and price trend in the A-share market [3]. Li Wen takes pharmaceutical manufacturing as example and shows that: it is feasible to use factor analysis method to study the investment value of listed pharmaceutical manufacturing companies in China [4]. Also, different secondary indicators have different impact on the investment value of companies. Besides tech manufacturing and pharmaceutical manufacturing, industries of cultural media, bank and agriculture are analyzed [5-7].

Following previous researches, in this paper, we exam the robustness of Value Investing in media stock among China, Japan, U.S. and France. The hypotheses we try to test are: 1) whether value investing is still alive in media market 2) which ratio is more important and accurate for predication. The reason we are interested in the media sector is that the media industry has become an important part of the digital economy as the convergence of the Internet and traditional media deepens. The globalization of economy and politics has greatly promoted the globalization of media, and on the other hand, the globalization of media in turn has greatly promoted the globalization of economy and politics. Therefore, media enterprises from different countries are analyzed with a global perspective to make investment decisions. Enterprise Value Multiples and Equity Value Multiples are applied to comparison. In empirical analysis, daily prices are studied from Oct. 8<sup>th</sup>, 2019 to Dec. 31<sup>th</sup>, 2020.

The organization of this paper is as follows. Section 2 explains Value Investing and methodology.

Empirical analysis is conducted in section 3. Section 4 is the conclusion.

## **2. Model and Methodology**

### **2.1 Value Investing**

In the stock market, the equivalent of a stock being cheap or discounted is when its shares are undervalued. Value investors hope to profit from shares they perceive to be deeply discounted.

Investors use various metrics to attempt to find the valuation or intrinsic value of a stock. Intrinsic value is a combination of using financial analysis such as studying a company's financial performance, revenue, earnings, cash flow, and profit as well as fundamental factors, including the company's brand, business model, target market, and competitive advantage. Some metrics used to value a company's stock include: Price-to-book, Price-to-earnings and Price-to Sales.

Besides equity value multiples, there are many enterprise value multiples used in the analysis, including analyzing debt, equity, sales, and revenue growth. After reviewing these metrics, the value investor can decide to purchase shares if the comparative value-the stock's current price vis-a-vis its company's intrinsic worth-is attractive enough.

### **2.2 Value Investing Strategies**

One side of value investing is to look at the price of what you buy, and the other is to look at the quality. Said simply, quality investing means buying “good” companies. Quality investing can be combined with value investing, which can be called “quality at a reasonable price”. A classic divided discount model (DDM) implies that the following are signs of good firms: higher profitability, more capital return to shareholders, safety and fast growth.

#### **2.2.1 Profitability**

##### **1) Gross Margin**

Gross margin reflects the sales revenue a company retains after incurring the direct costs associated with producing the goods it sells, and the services it provides. The higher the gross margin, the more capital a company retains on each dollar of sales, which it can then use to pay other costs or satisfy debt obligations. The net sales figure is simply gross revenue, less the returns, allowances, and discounts. It is calculated by subtracting its cost of goods sold (COGS) from a company's net sales revenue.

##### **2) Operating Margin**

Operating margin measures how much profit a company makes on a dollar of sales, after paying for variable costs of production, such as wages and raw materials, but before paying interest or tax. It is calculated by dividing a company's operating profit by its net sales.

$$\text{Operating Margin} = \frac{\text{Operating Earnings}}{\text{Revenue}} \quad (1)$$

##### **3) Ebitda Margin**

EBITDA margin is a measure of a company's operating profit as a percentage of its revenue. The acronym stands for earnings before interest, taxes, depreciation, and amortization. Knowing the EBITDA margin allows for a comparison of one company's real performance to others in its industry.

##### **4) Net Income Margin**

While gross margin focuses solely on the relationship between revenue and COGS, the net profit margin takes all of a business's expenses into account. When calculating net profit margins, businesses subtract their COGS, as well as ancillary expenses such as product distribution, sales rep wages, miscellaneous operating expenses, and taxes.

#### **2.2.2 Capital Return**

##### **1) P/e**

Analysis and investors review a company's P/E ratio when they determine if the share price

accurately represents the projected earnings per share. The formula and calculation used for this process follow.

$$P / E \text{ Ratio} = \frac{\text{Market value per share}}{\text{Earnings per share}} \quad (2)$$

## 2) Peg

A variation on the forward P/E ratio is the price-to-earnings-to-growth ratio, or PEG. The PEG ratio measures the relationship between the P/E ratio and earnings growth to provide investors with a more complete story than the P/E on its own. In other words, the PEG ratio allows investors to calculate whether a stock's price is overvalued or undervalued by analyzing both today's earnings and the expected growth rate for the company in the future. In our research, PEG ratios are calculated with historic growth rate, that is “trailing” PEG.

## 3) P/s

The price-to-sales (P/S) ratio is a valuation ratio that compares a company's stock price to its revenues. It is an indicator of the value placed on each dollar of a company's sales or revenues.

$$P / S \text{ Ratio} = \frac{MVS}{SPS} \quad (3)$$

where MVS means Market Value per Share and SPS means Sales per Share

### 2.2.3 Safe

A beta coefficient is a measure of the volatility, or systematic risk, of an individual stock in comparison to the unsystematic risk of the entire market. In statistical terms, beta represents the slope of the line through a regression of data points from an individual stock's returns against those of the market. Beta is used in the capital asset pricing model (CAPM), which calculates the expected return of an asset using beta and expected market returns.

$$\text{Beta coefficient } (\beta) = \frac{\text{Covariance}(R_e, R_m)}{\text{Variance}(R_m)} \quad (4)$$

where  $R_e$  = the return on an individual stock,  $R_m$  = the return on the overall market, Covariance = how changes in a stock's returns are related to changes in the market's returns, Variance = how far the market's data points spread out from their average value

### 2.2.4 Faster Growth

Growth rates refer to the percentage change of a specific variable within a specific time period. Growth rates are utilized by analysts, investors, and a company's management to assess a firm's growth periodically and make predictions about future performance. Most often, growth rates are calculated for a firm's earnings, sales or cash flow. Growth rates can be beneficial in assessing a company's performance and to predict future performance.

## 3. Empirical Analysis

### 3.1 Data

The reason for choosing and analyzing these five stocks is that each company is the leader in its own advertising and marketing media industry. Focus media, born in 2003, is the first elevator media in the world. In 2005, it became the first Chinese advertising media stock listed on NASDAQ and was selected into the Nasdaq 100 index in 2007. In 2015, it returned to A-share and its market value became the first share of China media. Omnicom is the world's largest advertising and communication group, ranking first in global advertising revenue. Interpublic is the second largest advertising and communication group in the United States. Dentsu group is the largest advertising and communication group in Japan. Publicis Groupe is the largest advertising and communication group in France.

Data is downloaded from Bloomberg database. The sample period is from Oct.8<sup>th</sup>, 2019 to Dec. 31<sup>th</sup>, 2019. The stock returns are the log returns and are calculated by following formula:

$$R_{i,t} = \ln P_{i,t} - \ln P_{i,t-1} \quad (5)$$

where  $P_{i,t}$  is the stock  $i$  spread at time  $t$ .  $R_{i,t}$  is the returns of stock  $i$  spread at time  $t$ .

Table 1 Descriptive Statistics.

	Mean	Med.	St.Dev.
Focus Media	-0.29%	0	0.02
Omnicom	-0.14%	-0.15%	0.009
Interpublic	-0.24%	-0.25%	0.01
Dentsu Group	0.00%	-0.24%	0.02
Publicis Groupe	0.10%	-0.20%	0.02

As shown in Table 1, the average value of the stock price's growth rate of Publicis Groupe showed a positive growth, while the increase in stock price fluctuated greatly, and the overall stock price trend was upward. Also, the number of days of Focus Media's stock price rises and falls is basically the same. However, the overall growth rate of other stocks is lower than Publicis Groupe. The negative mean and median reflect that the number of days of stock price decline is greater than the number of days of increase. In addition, the stock prices of Focus Media and Dentsu Group fluctuated at a high level while the prices of Omnicom and Interpublic were relatively stable.

## 3.2 Estimation Results

### 3.2.1 Equity Value Multiples

The price earnings ratio is a market prospect ratio that calculates the market value of a stock relative to its earnings by comparing the market price per share by the earnings per share. The results are shown in Table 2. Compared with the same industry, the price-earnings ratio of Omnicom, Interpublic and Dentsu Group is at a medium level, of which the Focus Media is higher and Publicis Groupe is lower. The forward price-earnings ratios of Focus Media, Omnicom, Interpublic, and Dentsu Group reflect that the market's expectations for the company's future have decreased, and the expectations for Dentsu Group are worse. The forward price-earnings ratio of Publicis Groupe has increased, which means that the market has given better expectations.

The lower the price-to-sales ratio, the greater the investment value of the company's stock. Focus Media's price-to-sales ratio is significantly higher than the other four companies, which represents the highest investment value.

The price-to-book ratio is the ratio of stock price per share to net assets per share. Stocks with a lower price-to-book ratio represent lower risk and higher investment value. The Interpublic's, Dentsu Group's, and Publicis Groupe's market-to-book ratios are significantly lower.

Focus Media has a high price-earnings ratio; however, its earnings are negative growth. Interpublic and Dentsu Group have a medium price-earnings ratio and the profit growth rate is high, which reflects the low PEG. Omnicom and Publicis Groupe's PEG are both greater than Focus Media, reflecting that the company's stock price is overvalued, and Omnicom is overvalued to a greater degree.

### 3.2.2 Safe

The beta calculation is used to help investors understand whether a stock moves in the same direction as the rest of the market, and how volatile or risky it is compared to the market. As we can see from Table 2, the volatility of Focus Media and Interpublic's stocks is greater than the volatility of performance evaluation benchmarks. The volatility of Dentsu Group's stock is exactly equal to the benchmarks, and the volatility of Omnicom and Publicis Groupe stocks is less than benchmarks.

Table 2 Valuation Indicators

	P/E	Forward P/E	P/S	P/B	PEG	beta
Focus Media	23.86	21.68	6.01	6.02	-0.7	1.07
Omnicom	13.64	12.99	1.21	7.14	3.05	0.68
Interpublic	13.75	12.29	0.89	2.89	0.65	1.03
Dentsu Group	13.1	9.99	0.9	0.91	0.91	1
Publicis Groupe	6.15	7.73	0.95	1.44	1.54	0.63

### 3.2.3 Growth

The debt-to-equity (D/E) ratio compares a company's total liabilities to its shareholder equity and can be used to evaluate how much leverage a company is using. The data in Table 3 tells us that the debt to equity ratio of Omnicom, Interpublic, and public group are all greater than focus media, and the pressure for long term debt repayment is greater. Especially for Omnicom, its creditors receive the least protection from the capital. While Focus Media has the strongest debt repayment ability, followed by Dentsu Group, the creditors are relatively protected and the investment value is relatively high.

Focus Media's sales growth rate is significantly higher than its peers, and its revenue growth is strong, however, its net income growth rate is significantly lower than its sales growth rate. The degree of realized income and realized profit does not match, which shows a more general profit situation. The sales growth and net income growth of the Omnicom and Interpublic are in the middle to low level of the industry. Dentsu Group and Publicis Groupe sales growth rates are acceptable, and Dentsu Group's net income growth is highest. Publicis Groupe's profit level is basically consistent with the income level. The above-mentioned company's market-sales ratio is less than Focus Media, generally speaking, such companies with low market-sales ratio are undervalued, which are more favored by investors.

Table 3 Capital Structure and Valuation Indicators

	D/E	EV/Sales	Sales Growth	Net Income Growth
Focus Media	7.04%	0.228	21.12%	3.12%
Omnicom	191.23%	0.011	2.20%	0.96%
Interpublic	167.98%	0.047	5.22%	5.99%
Dentsu Group	59.28%	0.013	9.65%	15.21%
Publicis Groupe	113.91%	0.008	10.60%	9.30%

The P/S ratio doesn't take into account debt. However, the enterprise value-to-sales ratio (EV/Sales) does. Enterprise value-to-sales is an expansion of the price-to-sales (P/S) valuation, which uses market capitalization instead of enterprise value. It is perceived to be more accurate than P/S, in part, because the market capitalization alone does not take a company's debt into account when valuing the company.

The lower EV/sales multiples mean that Omnicom and Interpublic are believed to be more attractive or undervalued. Generally, EV-to-sales values are between 1 and 3. The high EV/sales of other companies can be a sign that investors believe the future sales will greatly increase and the higher growth rate of sales in Focus and Nexstar companies can prove it.

### 3.2.4 Management

Table 4 Financial Indicators

	Gross Margin	Operating Margin	EBIT Margin	Net Income Margin
Focus Media	30.45%	21.40%	19.66%	15.49%
Omnicom	18.13%	15.45%	13.88%	8.96%
Interpublic	20.97%	16.11%	12.91%	7.60%
Dentsu Group	88.02%	15.00%	-4.62%	28.42%
Publicis Groupe	45.80%	12.69%	22.24%	8.58%

The gross margin is used to measure how their production costs relate to their revenues. According to Table 4, Dentsu Group's gross profit ratio is low, but its gross margin is significantly higher than its peers, reflecting the company's high level of expense management. The company's

gross margin is moderate for Focus Media and Publicis Groupe, and the low gross margin for companies Omnicom and Interpublic reflect the company's inefficient management.

A company's operating margin is a good indicator of how well it is being managed and how risky it is. Focus Media has the highest Operating Margin, what's more, EBIT margins and net profit margins are higher than the average of peers, and the profit margins are moderate. In a word, the main products and enterprises have the strongest overall profitability and strong core competitiveness, which reflects the good cost control. The performance indicators of the Omnicom and Interpublic responded to the average performance, which was at the lower level of the industry. Dentsu Group and Publicis Groupe have relatively high profit margins, reflecting the strong profitability of the company; however, the relatively large costs and expenses have dragged down overall performance.

### 3.3 Conclusions

In summary, the high price-earnings ratio and price-to-sales ratio of Focus Media indicate that the company has already been recognized by the market (the lower P/B ratio can also prove it); however, other indicators also reflect that the company has certain risks. The company's investment value is high but it also needs to pay attention to its performance risk and stock price fluctuation risk. Although Focus Media's sales are growing at a high speed, with the highest P/E ratio and risk, its stock price decreases with the highest speed.

Compared with Focus Media, Dentus Group's and Publicis Groupe's have a lower P/E ratio and PEG ratio, which means that both returns have a bigger space to increase. Also, the growth rate of net income and sale means a potential appreciation. Finally, the growth rates of both prices are same as the what P/E ratio and PEG ratio tell us. For Interpublic and Omnicom, both P/E ratio and PEG ratio stay on an average level, and as a result, the returns also have intermediate values.

Also, based on both indicators and stock returns, we find that the correlation between P/E ratio and return is negative while the correlation with PEG is positive. Compared with P/E ratio, PEG can give a more accurate prediction on performance. Sometimes, P/S ratio can also provide a prediction but the D/E ratio will have an influence. Publicis Groupe is a strong evidence. To sum up, value investing can play a good role on evaluating the performance of media stocks.

## 4. Conclusions and Future Extensions

In this paper, we check the robustness of value investing with media stocks. Enterprise Value Multiples and Equity Value Multiples are applied to make comparison. Stocks of China, U.S., Japan and France from Oct. 8<sup>th</sup>, 2019 to Dec. 31<sup>th</sup>, 2020 are analyzed. Empirical results show 1) for media stocks, value investing is still alive; 2) the correlation between P/E ratio and return is negative while the correlation with PEG is positive; 3) compared with other ratios, PEG has the most accurate prediction.

Future extensions will include but not limited to follows. First, we can check the robustness of media stocks for a longer period. Second, we can exam our results with other fields. Lastly, we can introduce other factors such as psychological factors and behavior factors for a better prediction.

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