Comparison Analysis for Investment Value of US's Technology Firms

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Abstract. Given the rapid pace of technology development, can we still benefit from investing in U.S. tech stocks today? To answer this question, we analyzed three typical U.S. tech stocks: TSM, Samsung, and Amazon. We use the current ratio and quick ratio to analyze the liquidity of enterprises. total asset turnover was used to measure the efficiency of asset utilization. ROA (Return on Asset) and ROE (Return on Equity) are used to measure the ability of enterprises to generate income based on assets and debts. P/B and P/E ratios calculate the market value of these three stocks. Finally, we come to the conclusion that investors who want short-term returns should choose Samsung, and investors who want long-term returns should choose TSM. Amazon stock is worse among these three stocks, so it can be ignored. Right now, technology doesn't allow us to analyze a large number of stocks in a short period; But in the future, if we have access to big data models, it's going to be very easy to figure out based on the kind of analytics we use, whether or not we're going to be able to benefit from investing in tech stocks.

Keywords: Stocks, Invest value analysis, Technology.

1. Introduction

In the last two decades, both the Internet and finance have flourished. People are increasingly concerned about how to make their economic conditions excellent. With the rapid development of the Internet, people pay more and more attention to Internet trade. In the past, people needed to go through tedious procedures and call different people to buy or sell stocks, but now people need to sit in front of a computer or on a mobile phone to do in real time what used to take three or four times the time [1-3].

How did you get rich if you ask someone who has become a millionaire in the last 20 years? They'll give you three answers: invest in real estate, start a business, or buy stocks. There is no doubt that the risks of the first two are incredibly high [4-5]. An inexperienced entrepreneur will often fail, and the real estate may be affected by policies, wars, and even the environment and thus depreciate. So investing in stocks is now the best choice for people who want to get rich [6-7].

In recent years, the technology industry has developed rapidly. People used to chat through landlines or written emails, but now they need to download smartphone social software to communicate anytime and anywhere.

With the rapid development of the technology industry, we have a curiosity. If we invest in tech stocks today, would they benefit us?

In this paper, we select three representative stocks in the technology industry, TSM, Samsung, and Amazon, and apply different financial analysis techniques to them to judge the return, risk, and market value of these three stocks.

After applying financial analysis techniques to these three stocks, we find that investors who focus on the short-term returns of fish should choose Samsung, and investors who focus on long-term returns should choose TSM. There are better choices than Amazon among these three stocks.

Technical hurdles prevent us from concluding the entire US tech market, But our research is designed to introduce a new perspective. After analyzing TSM, Samsung, and Amazon, you can use the same analysis methods to assess the risks and benefits of other tech stocks in the United States. If we wanted to analyze the entire U.S. tech market in our current era of big data analytics, we would apply the same analysis to the remaining U.S. tech stocks to get the answer to our ultimate question: Could we make money investing in U.S. tech stocks today?

2. Firm description

Samsung Electronics Co.Ltd is the largest electronics industry enterprise in South Korea, and also the largest subsidiary of Samsung Group.

Samsung Electronics took over the business of the Digital Image Business Unit in 2010, and formed a total of eight business units including the image display, IT solutions, household appliances, wireless, network, semiconductor and LCD business units [8-10].

In addition, in order to improve the comprehensive effect, the enterprise restructured the supporting business institutions and put the DAS (Digital Air Solution) business group and Samsung Guangzhou Electronics (manufacturing of household appliances and air conditioners), which were merged at the beginning of 2010, under the name of the household appliance business department. In addition, the STB (Set-top Box) business unit is also included in the jurisdiction of the Image Display Business Unit.

Taiwan Integrated Circuit Manufacturing Co.Ltd. ("TSMC") was established on February 21, 1987. TSMC is a specialized foundry in the semiconductor industry, mainly engaged in manufacturing, sales, packaging, testing and computer manufacturing, assisting in the design of integrated circuits and other semiconductor devices and the manufacture of masks. On September 5, 1994, TSMC's shares were listed on the Taiwan Stock Exchange (TWSE). TSMC listed some shares on the New York Stock Exchange (NYSE) in the form of American Depositary Receipts (ADS) on October 8, 1997.

Amazon is the largest online e-commerce company in the United States, located in Seattle, Washington. Amazon is one of the first companies to operate e-commerce on the Internet. Founded in 1994, Amazon only operated online book sales business at the beginning, but now it has expanded to a wide range of other products, including books, movies, music and games, digital downloads, electronics and computers, household and gardening supplies, toys, baby supplies, groceries, clothing, footwear, jewelry, health and beauty products, sports, outdoor supplies, tools And automobile and industrial products.

According to a search, Yahoo Finance has made a line chart of the price and volume of three companies in the past year.

Samsung's share price is stable, with a clear upward trend in the later period and a good development trend. The share price is in winning.

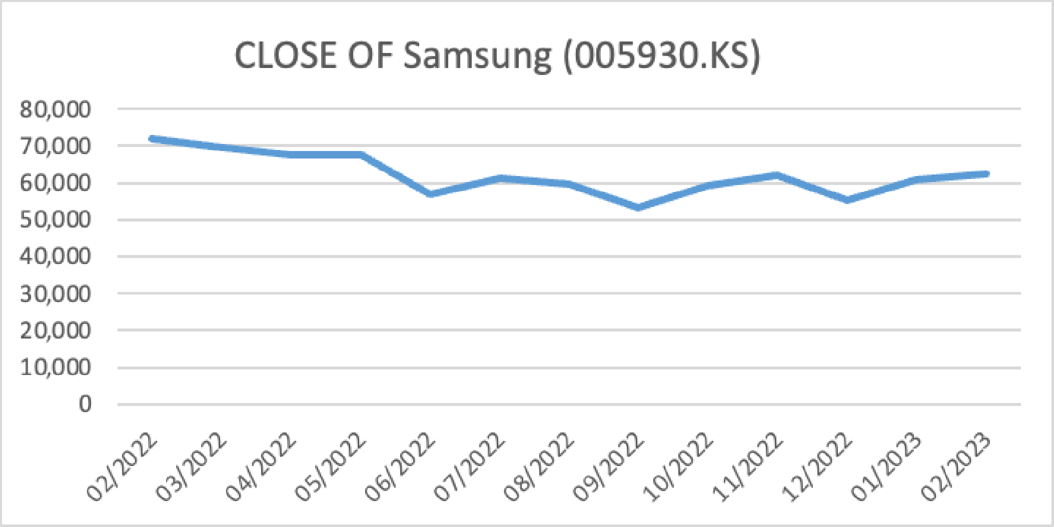

Fig 1. The close data of Samsung

Fig 1 shows the close data of Samsung in the past year. The stock began to decline in February 2022 and accelerated to decline in May 2022. After rising in June 2022, it continued to decline until September 2022, and only began to rise in September. At present, the stock price of Samsung has shown a gentle upward trend and is in the middle of its history.

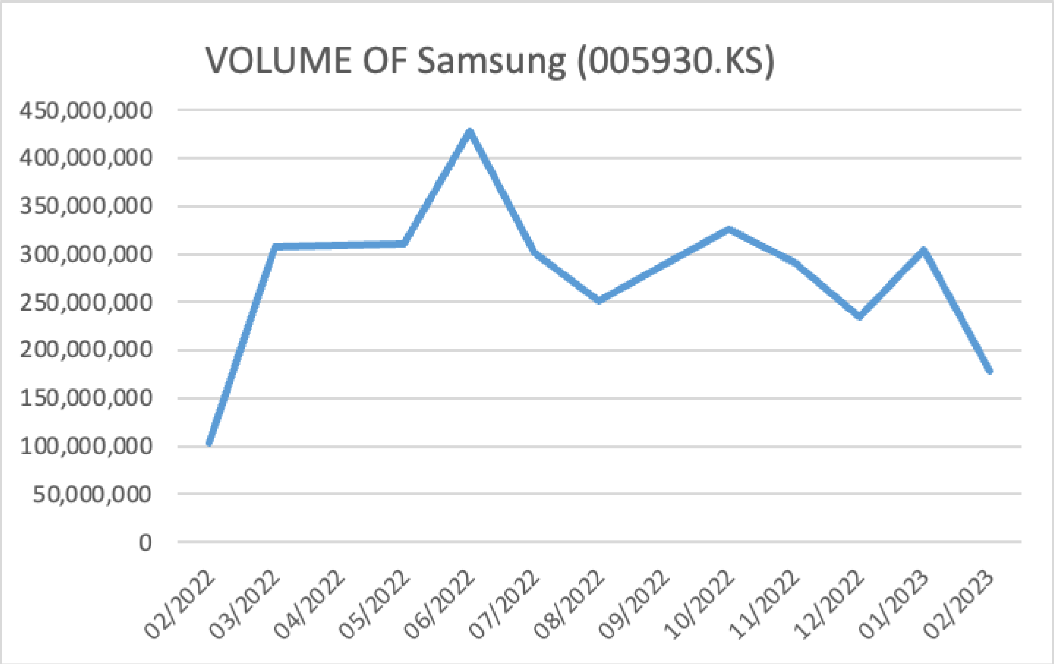

Fig 2. The volume of Samsung

Figure 2 shows the volume of Samsung began to increase from February 2022 to June 2022 and then began to decline in August 2022. After August 2022, it will continue to be slight until October 2022, but the volume of increase is not large. In October 2022, the overall trend is downward, and it is currently at a low value of historical volume.

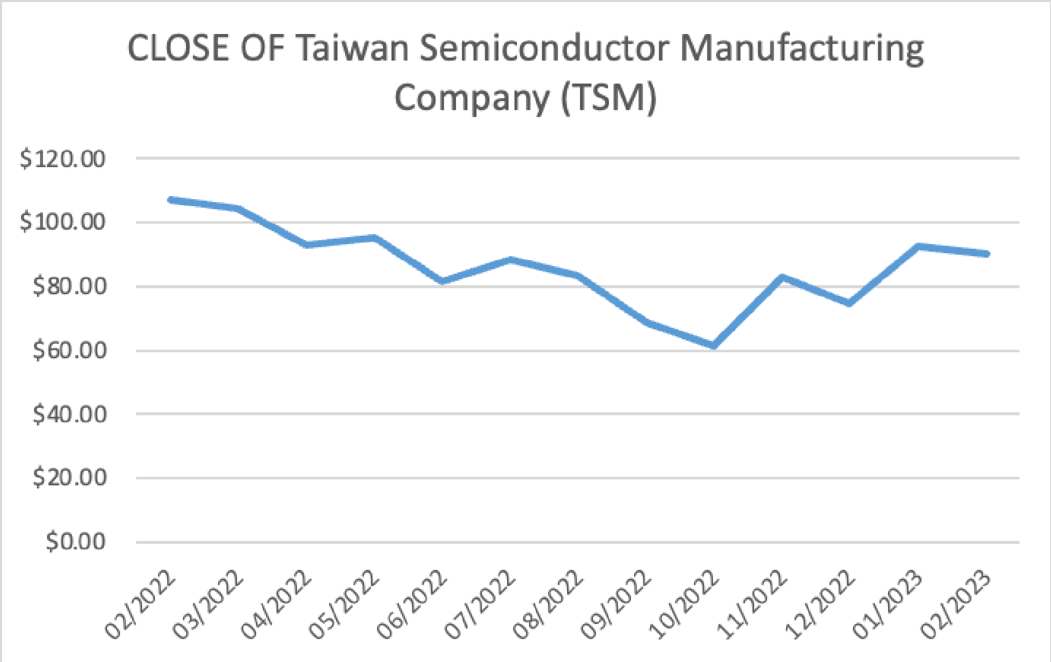

Fig 3. The close price of TSM

TSM's overall decline from February 2022 to October 2022, during which there was a rebound, but it had little impact on the overall situation. After October 2022, it began to rise to November, and then rose to January 2023 after falling back to December. At present, there are slight signs of decline. The stock price of TSM is currently at a historical high (Fig 3).

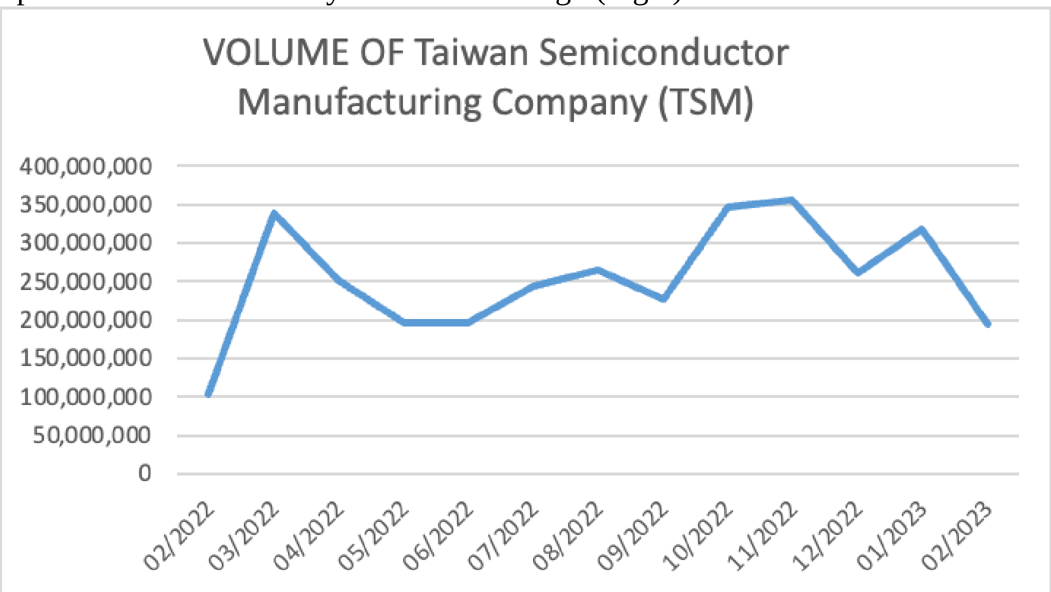

Fig 4. The volume of TSM

The volume of TSM increased from February 2022 to March, then fell to June after March, and then rose to August after June. From August, it fell slightly to September, and from September, it rose rapidly to November. November fell sharply to December, and December rose to January. After January 2023, it will drop sharply. At present, the share price of TSM has shown a downward trend and is in the historical median period.

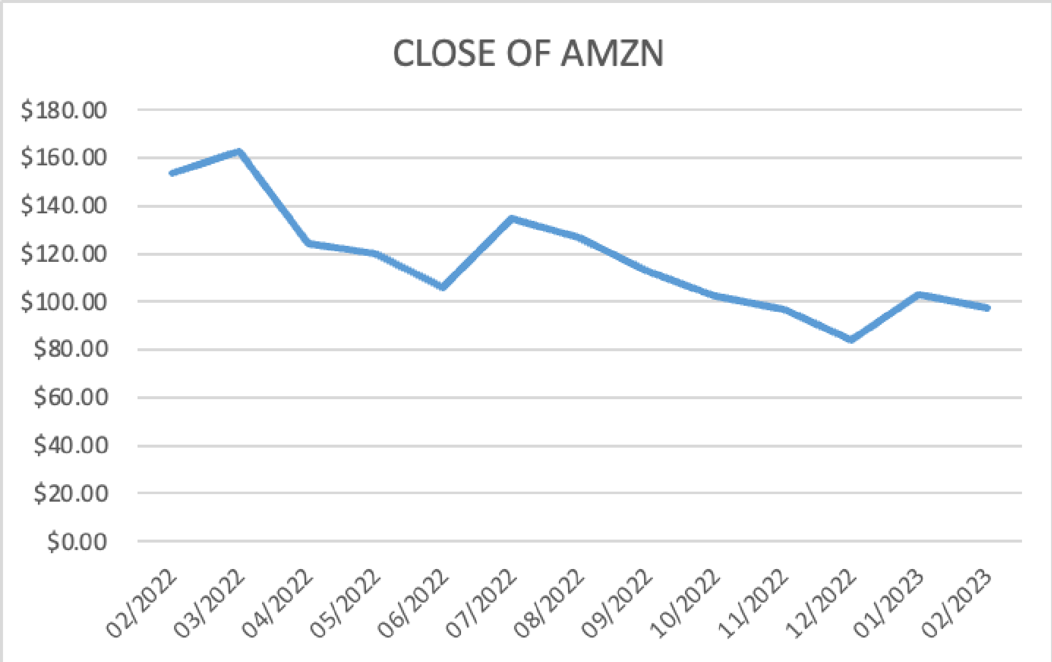

Fig 5. The close price of Amazon

Amazon's share price began to fall sharply to June in March 2022, and there was a 20:1 stock split in June. After June, it began to rise slightly to July, and after July, it continued to fall to December. From December, it rose slightly to January 2023 and then fell again. At present, Amazon's share price has shown a downward trend, and it is in a period of historically low value from the perspective of the historical share price.

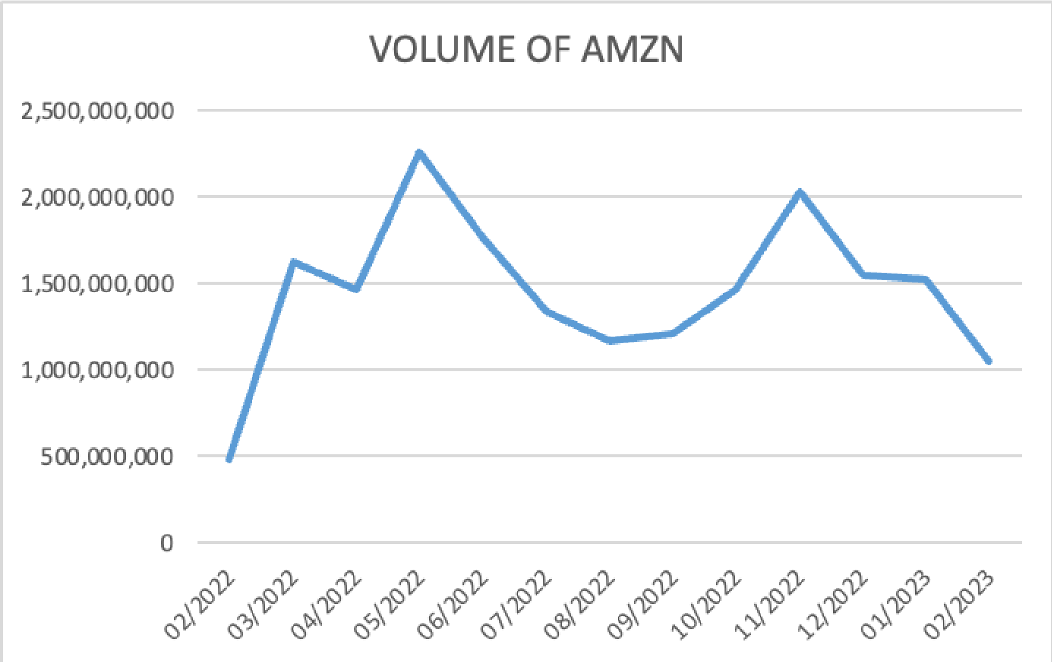

Fig 6. The volume of Amazon

Amazon's volume increased significantly from February 2022 to May and then fell significantly to June. The 20:1 stock split in June slowed the decline of the stock. The stock price fell in August and then began to rise in December. After December, Amazon's stock price fell to February 2023. At present, the stock price is obviously in a downward trend and is in a period of historically low value.

3. Financial Analysis

3.1. Liquidity, Solvency, and Asset Utilization

The financial analysis will begin with an overview of the three companies' liquidity, solvency, and asset utilization level.

Table 1. Liquidity of the three stocks

Liquidity Sector	Samsung (SMSN.IL)	Taiwan Semiconductor Manufacturing Company (TSM)	Amazon (AMZN)
Current Ratio	**2.94**	2.50	0.94
Quick Ratio	**2.27**	2.22	0.68

The quick ratio and the current ratio are the main indicators this report used to measure the liquidity of these three companies. A higher value means high liquidity for the company, implying that it can come up with funds faster in case of an emergency. According to table 1, the current ratio of Samsung is 2.94 and the quick ratio is 2.27, which has the advantage in both liquidity indicators. the level of liquidity indicators of TSM is not much less than that of Samsung, which is also at a better level, while the liquidity level of Amazon is weak relatively. Based on the above analysis, the liquidity of these three companies, in descending order, is Samsung, TSM, and Amazon.

Table 2. Solvency of the three stocks

Solvency Sector	Samsung (SMSN.IL)	Taiwan Semiconductor Manufacturing Company (TSM)	Amazon (AMZN)
Quick Ratio	**2.27**	2.22	0.68
Debt to Equity Ratio	**0.04**	0.32	2.12
Asset to Equity Ratio	**1.38**	1.69	3.10
Time Interest Earned	50.10x	**92.10x**	4.10x

The article will use four indicators in table 2 to measure the solvency level of the three companies. For the asset-to-equity ratio, debt to equity ratio values the debt level of the company, which reflects the risk and financial stability of the company. The lower the two indicators, the less risky and the more creditworthy the company's financial position is. According to table 2, Samsung still has an advantage, TSM is at an intermediate level, while Amazon indicator values are higher, indicating a higher level of debt. In addition, this article also uses time interest earned (TIE) as a solvency criterion. This indicator also reflects the company's ability to repay interest and debt, with higher values representing greater ability. Based on table 2, it can be seen that the TIE values of these three companies are within the acceptable range of investors, but the performance of the three companies is more fragmented: TSM has a clear strength in this indicator; Samsung also has an advantage, but there is still a distance away from TSM; while Amazon has an insignificant advantage. However, the metric does not take into account any upcoming principal payments. Even if a company faces principal payments large enough to exceed all EBITDA, the TIE may show a favorable number [1]. After comparing these four indicators together, the risk for Samsung, TSM, and Amazon ranges from low to high based on these considerations.

Table 3. Asset utilization of the three stocks

Asset Utilization Sector	Samsung (SMSN.IL)	Taiwan Semiconductor Manufacturing Company (TSM)	Amazon (AMZN)
Total Asset turnover	0.69x	0.67x	**1.16x**
inventory turnover	4.06x	4.42x	**8.61x**
Days Inventory Outstanding (DIO)	90 days	83 days	**42 days**

The following section will evaluate the level of asset utilization of these three companies based on table 3. The first is total asset turnover, where a higher value means that more assets can be used to generate income. On this metric, only Amazon's performance is attractive to investors. Following is the inventory turnover, where a high value means a short sales cycle and strong sales. The day's inventory outstanding refers to the average number of days before a company converts inventory to sales, with smaller numbers representing high utilization of inventory assets. Amazon still has a clear advantage in both inventory metrics, while, the other two companies do not have significant differences in their inventory asset utilization levels. Therefore, in the aggregate, the three companies asset utilization levels from highest to lowest are Amazon> TSM≈Samsung.

3.2. Risk and Profitability Ratios

Table 4. Risk of the three stocks

Risk Sector	**Samsung (SMSN.IL)**	**Taiwan Semiconductor Manufacturing Company (TSM)**	**Amazon (AMZN)**
Market Cap (USD)	332.55B	452.12B	**1030B**
Beta	**0.89**	1.23	1.17
Total Debt Ratio	**0.27**	0.41	0.68
Current Ratio	**2.94**	2.50	0.94
Quick Ratio	**2.27**	2.22	0.68

The riskiness of the three stocks will be assessed and ranked in the first phase. The data in the spreadsheet reveals that all three businesses are sizable with market capitalizations exceeding $300 billion, making them all dependable and steady. In this case, market capitalization is not considered an appropriate indicator of risk. For both quick and current ratios, TSM and Samsung performed similarly, with Samsung being the superior one. Amazon, on the other hand, has a weaker performance on these two indicators. Beta and the total debt ratio are the two significant risk indicators. Samsung, Amazon, and TSM are ranked in order of low to high risk for the beta. For leverage, their risk ranking from low to high is Samsung, TSM, and Amazon. Overall, this article considers these three stocks to have a risk ranking of Amazon > TSM > Samsung.

Table 5. Profitability of the three stocks

Profitability Sector	**Samsung (005930.KS)**	**Taiwan Semiconductor Manufacturing Company (TSM)**	**Amazon (AMZN)**
Total Asset turnover	0.69x	0.52x	**1.16x**
Profit Margin	0.12	**0.46**	0.02
ROA	0.08	**0.21**	0.02
ROE	0.13	**0.36**	0.09

Profit level is the most visual representation of a company's operating results and is an important part of the analysis when analyzing stocks. As indicated by table 5, TSM has a significant data advantage in three indicators, while Samsung's performance is more balanced in that its indicators are all in the middle level of performance. It is worth mentioning that although Amazon's total asset turnover is very high, its profit margin level is very low, which this article analyzes is due to that Amazon is an online retailer company, it pays attention to long-term benefits and mainly focuses on low-cost and low-price commodity transactions. The study by Mike Black reveals that of all the businesses examined, Amazon had the lowest online costs, with its prices being, on average, 13% less expensive than those of its rivals [2]. So it results in a high asset turnover rate but a low profit margin. In a comprehensive comparison, the profitability of these three stocks from high to low should be TSM, Samsung, and Amazon.

3.3. Market Value Ratios

Table 6. The market value of the three stocks

Sector	Samsung (005930.KS)	Taiwan Semiconductor Manufacturing Company (TSM)	Amazon (AMZN)
P/B Ratio	**1.15**	4.85	6.89
P/E Ratio	**9.62**	13.89	-365.91
Dividend Yield	**2.36%**	**1.87%**	/
PEG Ratio	**0.22**	**0.19**	3.12

Table 6 demonstrates that Samsung has an advantage in terms of PB and PE ratios. As for the dividend yield, Samsung got 2.36% and TSM got a 1.87%, Amazon does not pay dividends. While Samsung's dividend yield is slightly higher than TSM's, TSM's dividend payout is more stable based on the dividend payout history of both companies in Figures 1 and 2 below.

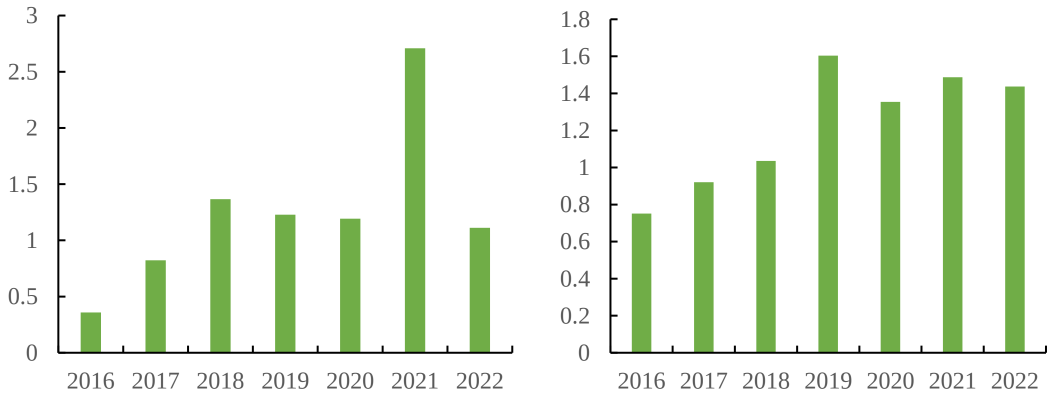

Fig 7. Dividend payout of Samsung and TSM

After calculating the 5-year DCF estimates, it is clear in table 7 that both Samsung and TSM are undervalued, while Amazon is overvalued. The upside of Samsung is 18.73%, TSM is 17.10%, and the upside of Amazon is -6.60%. This represents the market's strong confidence in the future cash flow of TSM and Samsung (Fig 7).

Table 7. DCF estimate of the three stocks

5Y DCF Growth Exit	Samsung (005930.KS)	Taiwan Semiconductor Manufacturing Company (TSM)	Amazon (AMZN)
Discount Rate (Growth)	8.50%	12.80%	11.30%
Fair Value	1419.43	105.49	90.74
Current Price	1195.50	90.10	97.20
Upside	**18.73%**	**17.10%**	**-6.60%**

In addition, this paper also determines the momentum of the three stocks by comparing the present stock price or the 50-day moving average price to the 200-day moving average price in table 8. Among them, only the present stock price of TSM is above the 200-day moving average price.

Table 8. Momentum analysis of the three stocks

Momentum	Samsung (005930.KS)	Taiwan Semiconductor Manufacturing Company (TSM)	Amazon (AMZN)
Current Price	1195.50	90.10	97.20
50-Day Moving Average	1,200.07	81.55	91.37
200-Day Moving Average	1,137.21	82.1	113.17
Is Current Price or 50 MA > 200 MA?	No	**Yes**	No

Overall, the investment recommendations offered in this article are Samsung for investors who focus on short-term earnings, TSM for investors who focus on long-term earnings, and Amazon is not recommended. According to Gartner's latest forecast, global semiconductor revenue is expected to decline by 3.6% in 2023 [3]. Deteriorating economic conditions and declining demand in the semiconductor industry make it inevitable that supply will outstrip demand. This article also believes that low demand and inventory adjustments will continue to affect the semiconductor business in 2023, which will also continue to affect the share price movements of Samsung and TSM. Based on the analysis of financial indicators in this paper, Samsung has an advantage in short-term liquidity and solvency indicators, which is more suitable for investors who expect to gain income in the short term. TSM, on the other hand, has advantages in long-term profitability levels and other aspects, so it is more recommended for investors who value long-term benefits. In 2022, Amazon's share price was cut in half amid risk aversion and fears of a global recession. While a rebound in the economy may drive Amazon's share price back up in the long run, combined with the financial analysis above, Amazon stock is currently overvalued with no bright performance across all metrics, so it is not recommended for buying at this time.

4. Conclusion

In conclusion, this finance research paper conducted an analysis of three companies - Samsung, Taiwan Semiconductor Manufacturing Company (TSMC), and Amazon - to measure their liquidity, solvency, asset utilization, and risk and profitability ratios. The results of the study indicate that Samsung performed well in terms of liquidity and solvency, while Amazon ranked the highest in terms of asset utilization. The study also ranked the three companies in terms of their risk, with Samsung being the least risky, followed by Amazon and TSMC.

The study found that Samsung has a high level of liquidity and solvency, making it less risky for investors. The company also performed well in terms of asset utilization, with a total asset turnover of 0.69x and an inventory turnover of 4.06x. TSMC had similar levels of liquidity and solvency as Samsung, but was ranked second in terms of asset utilization. Amazon, on the other hand, had the highest level of asset utilization, with a total asset turnover of 1.16x and an inventory turnover of 8.61x, but had poor levels of liquidity and solvency.

From the research findings, it is worth adding, for investors, it is important to consider the risk and profitability ratios of the companies when making investment decisions. Samsung and TSMC are less risky compared to Amazon, which has a high level of debt and a weaker liquidity position. However, Amazon's profitability indicators, such as total asset turnover and inventory turnover, are attractive to investors.

Secondly, it is recommended that future research should take into account the impact of macroeconomic factors on the financial performance of these companies. External factors such as changes in interest rates, inflation, and foreign exchange rates can have a significant impact on the financial performance of these companies. Therefore, future research can explore how these companies can mitigate risks associated with macroeconomic factors.

Finally, it is important for companies to maintain a strong liquidity position to ensure they can meet their short-term obligations. Based on the financial analysis, Samsung and TSMC have a stronger liquidity position compared to Amazon. However, Amazon has strong asset utilization levels, which may help them generate higher revenues in the long run.

One of the shortcomings of this study is that it did not consider the impact of principal payments on the time interest earned (TIE) ratio, which could lead to a favorable TIE ratio even when a company is facing large principal payments. Future research could incorporate this aspect into the analysis to provide a more accurate measure of a company's solvency. Additionally, the study did not consider other factors, such as market trends and external events that could impact the companies financial performance.

Overall, this study provides valuable insights into the financial performance of three major companies and can be used by investors to make informed decisions about investing in these companies. However, it is important to consider the limitations of the study and conduct further research to gain a more comprehensive understanding of a company's financial performance.

References

[1] Borad, S. B. (2022, September 23). Times interest earned – formula, advantages, limitations. eFinanceManagement. Retrieved February 21, 2023, from https://efinancemanagement.com/financial-analysis/times-interest-earned

[2] Black, M. (2022, November 16). Profitero reveals lowest-priced U.S. retailers heading into the Holidays. eCommerce Monitoring & Intelligence. Retrieved February 21, 2023, from https://www.profitero.com/press-releases/profitero-reveals-lowest-priced-u.s.retailers-heading-into-the-holidays?hsLang=en

[3] Goasduff, L. (2022, November 28). Gartner forecasts worldwide semiconductor revenue growth to decline 3.6% in 2023. Gartner. Retrieved February 21, 2023, from https://www.gartner.com/en/newsroom/press-releases/2022-11-28-gartner-forecasts-worldwide-semiconductor-revenue-growth-to-decline-3-6-percent-in-2023

[4] O'Connor Mary I.. (2022). Equity360: Gender, Race, and Ethnicity—How Walmart, CVS, and Walgreens Are Disrupting Healthcare (and Promoting Health Equity). Clinical Orthopaedics & Related Research

[5] Wang Xuhan (2022). From the perspective of Rice's text typology theory, "The 2020 Corporate Social Responsibility Report of West Wes Health Company" (excerpt), an English-Chinese translation practice report (master's degree thesis, Tianjin University of Commerce)

[6] Akiko Imai and Aiko Akiko and Akiko Imai. 2022. A study on the destructive innovation and competitive advantage of the U.S. pharmaceutical market: CVS health and Walmart 19 PP. 27-

[7] Feng, S., Zhang, R., & Li, G. (2022). Environmental decentralization, digital finance and green technology innovation. Structural Change and Economic Dynamics, 61, 70-83.

[8] Lee, C. C., & Wang, F. (2022). How does digital inclusive finance affect carbon intensity?. Economic Analysis and Policy, 75, 174-190.40.

[9] Gao Hongyang (2022). The world's top 500 companies were announced, and CVS Health led the drug retail market China Pharmacy (05), 90-92. doi:

[10] McKesson Corporation (2019); McKesson and Genpact Expand Their Relationship to Support McKesson's Finance Operating Model Optimization. Information Technology Newsweekly