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Can Fundamental Accounting Analyses be Used to Explain Macroeconomic Conditions?

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CAN FUNDAMENTAL ACCOUNTING ANALYSES BE USED TO EXPLAIN MACROECONOMIC CONDITIONS?

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Introduction:

Explaining macroeconomic conditions is an area of research that is constantly being investigated by people among all different industries and disciplines. Publicly traded companies must file their financial statements with the SEC each quarter (10-Q's) and each year (10-K's). Due to the nature of the timing of these filings, as they often are released within a few months of the year and quarter ends, they may be a good indicator of the economic climate when aggregated. Through the use of fundamental accounting ratios to analyze the data in these 10-Q and 10-K filings among a breadth of publicly traded companies, we can see trends that may explain macroeconomic outcomes (such as GPD). In this paper I will be using the financial statement data of publicly traded companies over a timespan of 1980 through the third quarter of 2017 to see if there are any specific accounting ratios that can explain the macroeconomic conditions during these times. This understanding is important because changes in the economic environment affects not just domestic businesses, but citizens, the government and the global network.

After running a Pearson Correlation on the accounting fundamentals to remove any highly correlated variables that could affect the data, I ran a regression of these financial accounting fundamentals on GDP. I found that 20% of the variation in GDP can be explained by the fundamental analyses. The analyses that had the greatest impact on GDP were the cash flow to total debt ratio, gross profit margin, the capitalization ratio, the current ratio, cash conversion cycle, inventory turnover, and the receivables turnover ratio.

Literature Review:

Accounting Information and Macroeconomic Indicators:

Konchitchki and Patatoukas (2013) analyzes the relationship between GDP forecasting and aggregate accounting data. The authors discussed how the current system used by the U.S. Bureau of Economic Analysis includes the use of tax data, such as corporate taxes. The authors pointed out that this measure used by the U.S. Bureau of Economic Analysis is based off of information from a prior year and is therefore not as timely as accounting data for public companies that is published once a quarter. Their study looked to see if aggregate accounting earnings could predict changes in GDP, as well as if this information can be used to forecast changes in GDP more accurately than the current methods used by the U.S. Bureau of Economic Analysis. Using earnings for public companies on the yearly and quarterly basis, the authors found that because aggregate accounting data is readily available and more up to date than tax data, it is a good predictor of GDP growth when looking at future quarters, especially in the quarter ahead, and is better suited for macroeconomic forecasting in real time. During their research, they also found that future GDP growth forecast errors can be predicted based off of the accounting earnings information that is available at the current time. In addition, they discussed how many economic methods do not include the accounting data and therefore accuracy in forecasting growth can be improved through using the accounting data for publicly traded companies. Their work is important to the research that I will be conducting as it supports the idea that fundamental accounting analyses can be used to explain, in part, changes to GDP and the macroeconomic conditions currently and possibly in the future.

Wang et al, (2015) extended these findings from Konchitchki and Patatoukas (2013) and applied it to the Chinese economy to see if it would work in a similar fashion given that Chinese

data is more manipulated than that in the U.S. because there is significantly more earnings management in the financial markets in China. This research further disaggregated accounting earnings into operating cash flows and accrual earnings to see if these separate numbers could predict GDP growth for three to four quarters in the future. Statistical analysis from 2007 to 2013 was used in order to test the findings of Konchitchki and Patatoukas (2013) in the Chinese economy. The findings were that while the disaggregated data, specifically operating cash flows, could be used to make predictions for one quarter in the future, it could not be used to accurately predict growth further out in time horizon as the U.S. data was able to complete. It also sheds light on how the role of earnings management can result in distorted earnings and should be taken into account when attempting to forecast more microeconomic data to that of the macroeconomy.

Unlike the previous research mentioned, Rouxelin, Wongsunwai, and Yehuda (2018) examine if there was a relationship between the unemployment rate and cost stickiness. The idea of cost stickiness is based off the notion that costs increase more when activity rises than they would decrease when activity falls by the same amount. The researchers hypothesized that during times of high cost stickiness there should be a period of low unemployment as these times of higher cost stickiness often see companies holding onto their resources. These costs are based off of operating expenses for a firm, such as the selling, general and administrative expenses and the cost of goods sold. The research found that there is a stronger relationship between cost stickiness and unemployment during the end of a recession. While this topic is not directly related to the idea of explaining macroeconomic activity with fundamental accounting ratios, unemployment is an indicator of recessions and macroeconomic activity. Therefore, their statistical analysis methods could be useful during my thesis data analysis in the future.

Accounting Information and Stock Market Performance:

You and Zhang (2008) studied the immediate and delayed market reactions in the United States to the SEC 10-K filings. They found that around the time that 10-K's were to be released, there were unusual volumes in the trades associated with that company's stock, and that the stock price itself also had unusual movements. In regard to the unusual movements, they looked at a 21-day average of the trading volumes and saw that the trade volumes during these times were double what they were on average during the period. Similarly, with the stock prices, they found that the price fluctuated more during this time than it did during the period average and that the returns were on average about double than the period average. Using a sample of 10-K forms that were filed between January 1st, 1995 and December 31st, 2005, they found that investors often underreact to the filings of companies who tend to have more complex 10-K reports. One of the reasons why this could occur is that consumers and analysts may feel more confident in respect to uncertainty with a report that provides more information as opposed to one that is more vague. If the person holding the stock was able to read more information in the footnotes of the 10-K, then they would have less uncertainty on if they should keep the investment or not, thus resulting in them keeping the stock. Their findings were similar to other research that had been conducted in the 1990's, further solidifying the idea that information uncertainty surrounding accounting data does result in changes in stock price and volume activity.

What is GDP?

According to the St. Louis Federal Reserve Bank, "Gross domestic product (GDP) is the value of the goods and services produced by the nation's economy less the value of the goods and services used up in production. GDP is also equal to the sum of personal consumption expenditures, gross private domestic investment, net exports of goods and services, and

government consumption expenditures and gross investment" ("US Bureau of Economic Analysis…" 2020). GDP can answer questions regarding how fast economies are growing or retracting and can be used as a measure to compare economies in different states or countries. It is also considered to be the most popular indicator when assessing the financial health of countries and the overall global economy. In the United States for example, the fourth quarter GDP for 2019 grew 2.1%, which is an average number for developed countries economies during times of economic expansion. GDP is calculated three times by the Bureau of Economic Analysis each quarter. The first time calculated it is referred to as the "advance estimate" as it comes out a month after the fiscal quarter ends and is based off of the information that is available to the BEA at that time. The second and third calculations include more information that was not available at the time the advance estimate was calculated and is therefore considered to be more accurate ("Gross Domestic Product" 2020).

Indicators of Macroeconomic Conditions:

Fossati (2015) conducted research to see if recessions could be forecasted in the United States based off of macro factors (smaller groups of macroeconomic indicators) as opposed to general macroeconomic indicators. Attempting to forecast recessions is often harder to complete in real-time due to the fact that business cycle phases cannot be directly observed. In addition, during the last recession, the National Bureau of Economic Research noticed a peak in economic activity, meaning that economic activity was at the highest point it has been at since the previous recession, in December of 2007 but did not issue a public statement until December of 2008. While this peak is not known to be the peak until there are at least two consecutive quarters of a decline in GDP, the NBER would have known it was the peak earlier than them issuing the public statement at the end of 2008. Three different factors were considered during their

research, including: real activity factors, bond and exchange rate factors and stock market factors. The real activity factors included personal income less transfer payments, industrial production, employment and real manufacturing trade and sales. The bond and exchange rate factors included interest rates, interest rate spreads and exchange rates. The stock market factors included stock price indexes, dividend yield and the price to earnings ratio. Their results show that probit models that were based off of the three macroeconomic factors (real activity factors, bond and exchange rate factors and stock market factors) provided the best predictions for NBER recessions, however, if only financial information is being used (for example: exchange rates, bonds, and interest rates), then the fit of the data starts to decline after 2005.

Abberger and Nierhaus (2008) details various definitions for what constitutes in a recession. The first definition is one that discusses the three dimensions of a recession: duration, depth and diffusion. These three D's mean that during a recessionary period there is a permanence of the condition, resulting in the overall economic activity decreasing, thus affecting a vast portion of the economy. The next definition, used by United States from the National Bureau of Economic Research, states that a recession is "a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production and wholesale-retail sales". This data published by the NBER is often published over a year after the data occurred, therefore not making it the most accurate or timely method. The final definition that they discuss states that a recession is the "decline in the seasonally and calendar adjust real gross domestic product (GDP) in at least two consecutive quarters".

According to an article posted by the St. Louis Federal Reserve Bank in 2009, they define as recession as periods of economic contractions with "two consecutive quarters of negative real gross domestic product (GDP) growth" (Smith 2009). These periods of negative growth usually coincide with the economic activity during the period peaking and then declining, reaching a trough before activity increases yet again and pulling the economy out of a recession. In addition to this definition, they further mention that payroll employment rates are also a factor when looking at recessions, as these rates often follow a similar peak and trough behavior as GDP. Historically, the average recession in the United States has lasted 10 months since World War II, with the 2008 recession lasting 18 months. All of the above indicates that GDP is a good indicator of macroeconomic conditions, including recessions.

Research questions:

Growing up, a large portion of adolescence was during The Great Recession in 2007/2008. However, being barely 10 at the time, I was unaware of what had caused it and what the implications would be in both the short-term and long term. This fascination for The Great Recession and overall behavior of the greater macroeconomic environment has followed me throughout the rest of my primary education and into my undergraduate studies. As my education progressed, I had learned about how GDP was calculated and the various different components that go into the figures, however, with my accounting studies focus I still had unanswered questions. During previous coursework conducted in Fall 2018, I was able to spend more time analyzing financial statement data of publicly traded companies. It is not uncommon for publicly traded companies to have stock price increases and decreases based off of earnings reports filed both quarterly (10-Q) and annually (10-K) with the SEC, and this led me to ask

myself if these reports and the data within them could have a correlation with the overall changes in GDP.

The main question surrounding this research is to investigate whether or not there is a relationship between key financial accounting ratios and macroeconomic conditions. The macroeconomic condition that I am comparing these accounting analyses to is the United States GDP. Some figures that are linked to recessions and other macroeconomic conditions are GDP and the unemployment rate. Generally, decreases in GDP signify slowing of economic activity, which can foreshadow a recessionary period. Inversely, if the unemployment rate is increasing over a period of years of quarters, this could also indicate a recession.

The key accounting ratios that I am using are constructed under the DuPont Framework. The DuPont Framework details the linkages between key ratios and further categorizes these into either profitability, efficiency or leverage and is a means of helping people to avoid misleading or conclusions that are not helpful. As shown in Appendix A on page 23, the framework starts at looking at Return on Equity, and then breaks that into the return on assets category and financial leverage. From the return on assets it then breaks further into asset turnover and profit margin. Return on equity is considered to be a profitability measure, while asset turnover is an efficiency measure and financial leverage being a leverage measure. In appendix B on page 23, I show all of the fundamental analyses I have used under the profitability, efficiency and leverage aspects of DuPont. For example, inventory turnover and receivable turnover would fall under efficiency, and gross profit margin is related to profitability.

Methodology:

In order to complete the research, I used financial data that is available for public companies from the SEC that has been compiled on the Wharton Research Data Service

(WRDS), specifically through their Compustat database. The Compustat database has access to financial data for all publicly traded companies from 1950 to most recently, which allows for trends to be seen over time during periods of both economic expansion and contraction. I then downloaded this information from 1980 to the third quarter of 2017 into Excel and used this to calculate all the ratios listed in Appendix A on page 22. The analysis was stopped at the third quarter of 2017 as this was the last quarter that data was available in the area of the Compustat database that I was pulling the information from.

Once I calculated these ratios, I ran Pearson correlations to identify if any of these ratios were highly correlated to one another. If any of the ratios had over a .5 for their level of correlation, I removed one of them from my sample before running the regression as this could skew my results during the regression due to the variables not being independent of each other. The only variables that had a high correlation were the current ratio and the acid test at a level of .9539, so before running my regression I removed the acid test ratio from my data set. In addition, I accessed GDP data from the St. Louis FRED (Federal Reserve Economic Data) from 1980 to the third quarter of 2017. After inputting the GDP to the data set, I ran a multivariate regression of regressing all the fundamental accounting ratios on GDP.

How are the fundamental ratios calculated?

- Profitability ratios

Net profit margin is the ratio of the net profits that a company earns to their revenues for the period. This ratio is a way for investors to assess if a company is earning enough profits from their sales and if the overall costs are being controlled appropriately. All of the information needed to calculate it comes from the income statement for the company. It is calculated by taking a company's revenue and then subtracting the cost of goods sold, operating and other

expenses, interest and taxes for the period and then dividing this number by the revenue for the period. This ratio is one of the more important ratios for a company's health financially, which is why I chose it when deciding which fundamental analyses to use for my regression analysis.

Gross profit margin is a measure is calculated by taking the revenue for a company and then subtracting the cost of goods sold from it and dividing this number by the revenue. Generally speaking, companies want to have a higher gross profit margin ratio as this means that they are able to keep their costs associated with the sale of the product lower, thus increasing their overall net income for the period. For example, if a company had revenues of $100 and a cost of goods sold of $75, then their gross profit margin would be .25, meaning that for every dollar that is earned, the company has earned 25 cents before other expenses have been paid. I chose to use this as one of my variables as it is a profitability measure and if companies have higher gross profit margins, then they have more income and when aggregated, GDP should then in turn increase.

- Efficiency Ratios:

Gross profit to total assets, also known as the gross profitability ratio, is calculated by taking the gross profit a company has earned and then by dividing it by the total assets. The gross profit for a company is calculated using the revenues less the cost of goods sold, and both of these values are found on the income statement. Total assets are the sum of all current and long-term assets found on the balance sheet. I chose to include this fundamental ratio in my regression analysis as it includes numbers from both the income statement and the balance sheet and is tied into the profitability of the company.

The inventory turnover ratio tells us how effective a company is able to convert their inventory into sales. This ratio can be calculated two different ways. The first method is

calculated by taking the cost of goods sold and dividing it by the average inventory. The other method calculates inventory turnover by taking sales and dividing it by inventory. Companies who have a higher inventory ratio are able to sell their inventories faster, and therefore are able to generate revenues faster. In addition, selling inventory faster can also indicate that there is still a demand for the product and that revenues will continue while there is still a demand.

The cash conversion cycle in days, also known as the net operating cycle, is a means of measuring the amount of time that each dollar is tied up in the production/sales processes before it can be turned into actual cash and revenues. This measure helps to evaluate the overall efficiency of a company, specifically in concerns with their management and operations. This measure is calculated by adding days sales of inventory to days sales outstanding and then by subtracting days payable outstanding. While this measure can vary from industry to industry, it is generally better for companies to have this number be on the lower end as this means that they are able to receive cash faster.

The receivables turnover ratio attempts to quantify how effective a company is in collecting the money that is due to them from their clients who have purchased goods or services on account. This ratio is calculated by taking net credit sales and dividing it by the average accounts receivable balance. Net credit sales are calculated by taking the total sales made on account and then subtracting the purchase returns made by customers. The average accounts receivable balance is calculated by taking the beginning accounts receivable balance adding it to the ending accounts receivable balances and then dividing this total by two. Generally, a higher receivable turnover ratio is better as this signifies that customers are repaying their debts faster, and that the possibility of uncollectible accounts could be lower.

The payables turnover ratio falls under the leverage umbrella and is a ratio that indicates how many times a company a company can pay of their accounts payable for a certain timeframe. Accounts payable is considered to be a short-term debt as it is often due within one year. It is calculated by taking the total purchases and dividing it by the sum of the beginning accounts payable and the ending accounts payable balances divided by two. While it is better to have this ratio lower, companies do not want it to be too low as this could mean they are repaying debt too fast and not partaking in investing activities that could better the company in the long run.

- Leverage ratios

The capitalization ratio, also known as the financial leverage ratio, is means of comparing a company's total debt to their total capitalization. This ratio is calculated by taking the total debt for a company and then dividing it by the sum of total debt and shareholder's equity. While this ratio is similar to the debt to equity ratio, they did not have a high correlation after I calculated the Pearson value, and therefore I decided to keep this fundamental ratio in my data analysis.

Total debt to EBITDA is a ratio that measures the amount of income that a company has that is available to be used to pay off debt before factoring in the interest, taxes, depreciation and amortization expenses. EBITDA stands for earnings before interest, taxes, depreciation and amortization. This ratio is calculated by taking the total debt (short-term and long-term debt) and dividing it by EBITDA. Generally, higher ratios mean that a company has too much debt as this ratio is a measure of their ability to pay off their incurred obligations. I chose to include this fundamental ratio as it is an important indicator of a company's financial health and their ability to pay off their debts.

Cash flow to total debt is a coverage ratio that looks at a company's cash flow from their operations and their total debt. This ratio is calculated by taking the total cash flows from operating activities and dividing it by the total debt. It shows how long it would take a company to pay off their debts if they devoted all of their cash flow to repaying those liabilities. Generally, a higher ratio is better as this means that the company is better suited to pay off their current debts.

Total debt to total assets is a leverage ratio that can indicate how well a company is doing financially. It is calculated by taking the total debt and dividing them by the total assets. A higher ratio means that the company has more debt that assets, and therefore is in a worse financial position and may not be able to repay its debts as easy. This ratio is calculated similarly to the capitalization ratio, however, when doing the Pearson calculation, the two were not highly correlated and therefore I included this in my data set.

Total debt to equity is classified as a capitalization ratio, meaning it is a measure of the company's debt to their capital structure. These ratios are important when evaluating a company's financial health and generally companies want to have a lower debt to equity ratio as this means they have stronger financial leverage. The debt to equity ratio is calculated by taking the total liabilities for a company and dividing it by the total shareholder's equity. This ratio uses balance sheet data and is therefore data at a specific point in time.

The current ratio, also referred to as the working capital ratio is a leverage measure that reflects the ability a company has to pay off their current debt that is due within one year. This ratio is calculated by taking the current assets for a company and then dividing it by their current debt. In this case, "current" means all debt that is due within a year and all assets that can be liquidated and converted to cash within a year. If a company has a ratio of less than one, then this

means that the debt that is due within the next year exceeds the current assets and that the company is in a disadvantaged financial position. While a ratio of greater than one is preferred, if the ratio gets too high then this could mean that the company is not able to manage their assets efficiently.

The acid test, also known as the quick ratio, is a means of comparing the current short-term assets to the short-term current liabilities. The quick ratio is calculated by taking the sum of cash, marketable securities and accounts receivable and dividing it by the current liabilities. While it is similar to the current ratio, it does not take into account the portion of current assets that are not easily liquidated, for example, inventory. However, after running the Pearson correlation, I ultimately decided to not include this fundamental ratio in my regression analysis.

Data Analyses:

Preliminary expectations:

My preliminary hypothesis is that there would be a link between GDP, the receivable turnover ratio, inventory turnover ratio, and gross profit margin.

The inventory turnover ratio is calculated by taking that periods cost of goods sold and then dividing it by the average inventory for the period. Generally higher ratios are preferred as this would relate to the sales in a given period being higher than the inventory. During periods of decreased macroeconomic activity, sales tend to drop, and inventory levels can rise, which would in turn result in a lower turnover ratio.

The accounts receivable turnover ratio is calculated by taking net credit sales and dividing it by the average accounts receivable balance. The rationale behind predicting that this ratio will have a relationship with GDP is that during these periods of economic activity declining, customers who have purchased either goods or services from a company on account

may not be able to pay these debts as quickly as they would have before, thus resulting in a lower ratio. In addition, the longer that an account receivable is outstanding could result in a higher likelihood that this account balance will not be paid off, which could show a link with a decline in economic activity.

Gross profit margin is calculated through taking sales less the cost of goods sold during a given period. This number can also be represented as a percent by taking the calculated gross margin and dividing it by the total sales. A higher gross margin is traditionally linked to a company being healthier financially, so if this number or percentage begins to decrease, this could signal that sales are decreasing. Decreasing sales can result in a decrease in GDP activity, and therefore could link to changes is the macroeconomic conditions during the period.

When formulating my preliminary hypothesis, I did not think that the other ratios I ran regression on would have had as much of an effect as gross profit margin, accounts receivable turnover and inventory turnover. When looking at gross profit margin and net profit margin for example, net profit margin is calculated by taking sales less the cost of goods sold less all other expenses (including interest, operating expenses and taxes) and dividing it by sales. Gross profit does not take into account taxes and operating expenses, and strictly looks at sales less the cost of goods sold and how much revenue is generated from each unit sold. While net profit margin is important in relation to the financial health of a company, it can be skewed by companies who have higher or lower interest and tax expenses that are not within the mean for the industry, thus not making it as good of a fit as the gross margin.

Results:

When running the regression analysis, I used GDP as the dependent variable (y) and each of the accounting ratios as the independent variables (x). After running the regression, I found

that there was an R-squared value of 20% in Table 1 on page 21. This means that 20% of the variation in GDP can be explained by the fundamental ratios. Table 2 on page 21 details the variables and the associated coefficients and p-values after running the regression analysis. Gross profit margin, the capitalization ratio, cash flow to total debt, the current ratio, cash conversion cycle, the receivables turnover ratio, and the inventory ratio all had significant p-values and have the strongest correlation to GDP. In addition, all of the significant values all have positive coefficients with the exception of the cash conversion cycle and receivables turnover. The cash conversion cycle ratio having a negative coefficient make sense as companies generally want this to be lower, as this means they are earning revenues faster. As this ratio increases, it is taking longer for the company to earn revenue, which in turn would result in a lower GDP. When looking at the p-value and coefficient data, it can be hard to visualize what it truly means. For example, an increase in the gross profit margin would then in turn increase GDP the amount of the increase in the ratio multiplied by 139.18. In economic terms, this would mean that for every 1% increase in the gross profit margin there is an expected increase in GDP of $1.39 billion.

The ratio that appears to be the most important based off of the coefficient and the p-value calculated during the regression is the cash flow to total debt ratio. This ratio has the largest marginal effect on GDP with a coefficient of 1,030.76 and a p-value that is <0.00. Companies who have higher cash flows from operating activities are generally earning more revenues, and an increased numerator over the total debt (denominator) results in a higher ratio, which is more favorable and indicates that a company is able to pay off their debts faster. Seeing this result was surprising to me as it was not one of the ratios, I preliminarily thought to have the strongest link to GDP.

Looking back at my initial predictions that included there being links between GDP, the receivable turnover ratio, the inventory turnover ratio and the gross profit margin, I was correct. The gross profit margin, receivable turnover ratio, and the inventory turnover ratio were significant, and all had p-values that were less than 0.05.

Robustness Test:

During the beginning of my data analyses, I ran a Pearson Correlation before running my initial regression and removed the acid test ratio from my analysis as it was highly correlated with the current ratio. After running my initial regression, I decided to run the regression again but this time with the acid test ratio instead of the current ratio. Table 3 shows the results of this regression and indicates that changing the ratios did not have an effect on the R-squared value as it was still calculated to be 0.20. In addition, the variables that were significant in the initial regression (gross profit margin, the capitalization ratio, cash flow to total debt, cash conversion cycle, the receivables turnover ratio, and the inventory ratio) including the current ratio were still significant in the regression including the acid test as shown in table 4. This new regression did show, however, that the gross profit to total assets ratio is now significant as it has a p-value of 0.06 as opposed to 0.28 in the initial regression.

Conclusions:

In this study, I examined whether fundamental accounting ratios can help to explain variations in GDP. Specifically, I used the net profit margin, gross profit margin, gross profit to total assets, the capitalization ratio, total debt to EBITDA, cash flow to total debt, total debt to total assets, total debt to equity, the current ratio, the cash conversion cycle in days, inventory turnover, receivables turnover and the payables turnover ratio. This investigation is important as

it could help us to understand changes in the economic environment, as these changes can affect the overall global network and individual citizens across all sectors.

In order to complete my analyses, I downloaded financial statement data from the Compustat database from 1980 to the third quarter of 2017 that included key fundamental accounting analyses. From there I ran a Pearson correlation test to remove any variables that were highly correlated with one another, as these would not be independent and could skew my final results during the regression analysis. After removing the variable that was most correlated with another, I ran the regression in Excel to see if there was a link between the fundamentals and GDP. While it still remains difficult to explain macroeconomic conditions with one key factor, fundamental accounting analyses can be used to help explain these variations. During my regression analysis I found that 20% of the variation in GDP could be attributed to these ratios, and while 20% is not the majority portion, it still can explain a significant portion of these changes in the macroeconomy. Further, I find that the gross profit margin, capitalization, current, and cash flow to total debt ratios are particularly important in explaining the variation in GDP.

While I was able to find a link between the fundamental analyses and GDP, there are still a few research questions that I have lingering. One of these future research areas is to investigate whether or not these analyses within specific industries have a stronger correlation with GDP than others. For example, seeing if the fundamentals calculated in the retail sector have more of a relation with GDP than say the healthcare sector. In addition to seeing if any sectors have a stronger link with changes in GDP, further analysis could be conducted to see if based off of the fundamentals data there is a relation with recessionary periods. From there, we could then investigate if it could be used to predict macroeconomic conditions, such as recessions to see if one could be occurring currently or in future quarters.

The current economic climate has changed drastically from the beginning of 2020 to early May 2020 due to the novel coronavirus. At the current time, there is no way to predict how much of an economic and financial impact this virus is going to have on local and global companies, individuals and countries. During the first quarter of 2020, the GDP in the United States decreased by 4.8% from the previous quarter, signaling the largest drop since the 2007/2008 recession (McCormick 2020). In addition, many companies over all sectors are being negatively impacted by the virus. As the stay at home orders have been in effect, many non-essential businesses have closed and have either furloughed or laid off their employees as a result of the closures and lack of business. This decrease in business activity and consumer spending will most certainly continue to decrease the revenues and profits for companies while the virus is still prominent. Given the results of my data analyses showing that all of the significant key fundamentals had a positive coefficient when regressed on GDP, decreases in these fundamentals should result in a decrease in the total GDP at that given time.

Data

Table 1

Regression Statistics	
Multiple R	0.45
R Square	0.20
Adjusted R Square	0.20
Standard Error	4,539.45
Observations	44,602

Table 2

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	11,178.92	97.38	114.80	-
Net Profit Margin	(0.14)	0.86	(0.16)	0.87
Gross Profit Margin	139.18	16.95	8.21	<0.00
Gross Profit/Total Assets	114.11	104.62	1.09	0.28
Capitalization Ratio	403.22	34.41	11.72	<0.00
Total Debt/EBITDA	(0.03)	0.09	(0.28)	0.78
Cash Flow/Total Debt	1,030.76	71.69	14.38	<0.00
Total Debt/Total Assets	75.43	116.63	0.65	0.52
Total Debt/Equity	(0.05)	0.09	(0.51)	0.61
Current Ratio	169.01	15.54	10.87	<0.00
Cash Conversion Cycle (Days)	(31.84)	0.46	(68.62)	<0.00
Inventory Turnover	0.00	0.00	2.04	0.04
Receivables Turnover	(223.12)	3.71	(60.12)	<0.00
Payables Turnover	0.08	0.06	1.37	0.17

Table 3:

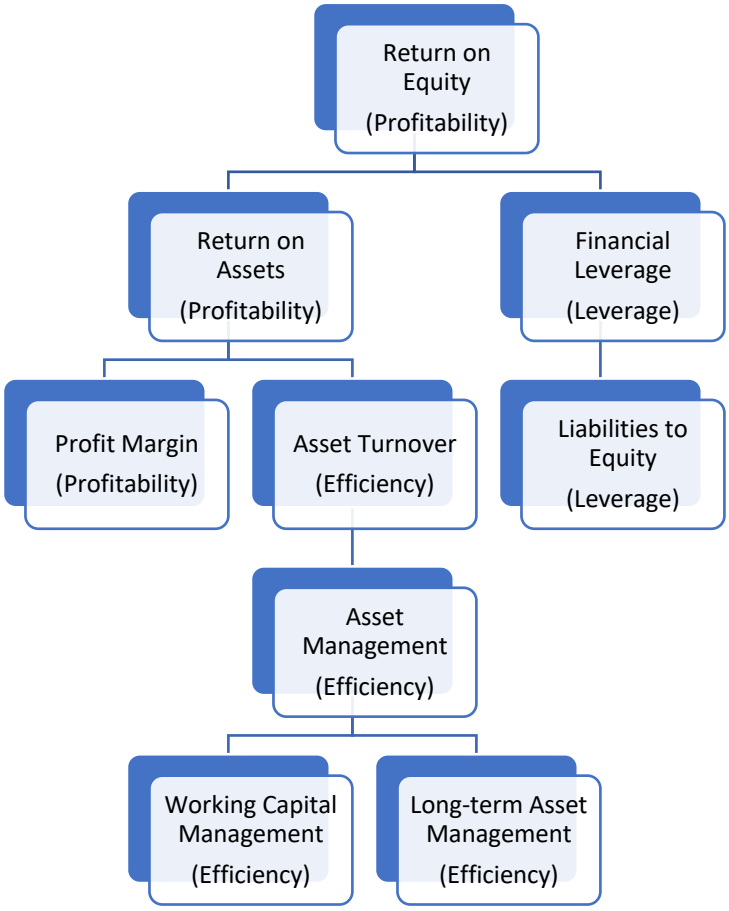
Regression Statistics	
Multiple R	0.45
R Square	0.20
Adjusted R Square	0.20
Standard Error	4,545.07
Observations	44,602.00

Table 4:

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	11,618.88	91.50	126.98	-
Net Profit Margin	(0.04)	0.86	(0.04)	0.97
Gross Profit Margin	116.66	16.98	6.87	<0.00
Gross Profit/Total Assets	195.00	104.62	1.86	0.06
Capitalization Ratio	415.98	34.43	12.08	<0.00
Total Debt/EBITDA	(0.03)	0.09	(0.30)	0.76
Cash Flow/Total Debt	977.71	71.77	13.62	<0.00
Total Debt/Total Assets	(358.75)	112.39	(3.19)	<0.00
Total Debt/Equity	(0.05)	0.09	(0.55)	0.58
Quick Ratio (Acid Test)	45.34	16.37	2.77	0.01
Cash Conversion Cycle (Days)	(31.41)	0.46	(67.69)	<0.00
Inventory Turnover	0.00	0.00	2.00	0.05
Receivables Turnover	(223.23)	3.72	(60.07)	<0.00
Payables Turnover	0.07	0.06	1.21	0.23

Appendices

Appendix A



Appendix B

Profitability Ratios	Efficiency Ratios	Leverage Ratios
Net Profit Margin	Gross Profit to Total Assets	Capitalization
Gross Profit Margin	Inventory Turnover	Total Debt to EBITDA
	Cash Conversion Cycle	Cash Flow to Total Debt
	Receivables Turnover	Debt to Assets
	Payables Turnover	Debt to Equity
		Current Ratio
		Acid Test (Quick Ratio)

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