Krause Fund Research
Spring 2018

Consumer discretionary — AutoZone, Inc. (NYSE: AZO)

April 17, 2017 Stock Rating: **Hold**

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Company Overview

AutoZone is an automotive aftermarket parts dealer in the United States. The automotive aftermarket parts industry is a mature industry with few large competitors. The company started in 1968 as a major grocery retail chain.[17] On July 4th, 1979 CEO J.R. Hyde shifted the trajectory of the company to focus specifically on specialty retail sales including the opening of the first specialized motorist store, Auto Shack.[17] The company went public in 1991 under the ticker symbol “AZO”, eventually expanding into all 50 states, Mexico, and Brazil.[17] Auto Zone is currently attempting to stand out in a slow growth industry via efficient supply chain capabilities, customer service, and commercial growth targets.

Stock Performance Highlights

52 week High	$797.89
52 week Low	$491.13
Beta Value	0.87

Share Highlights

Market Capitalization	$19.8 b
Shares Outstanding	27.4 b
Next Est. EPS (2018, Q2)	$8.82
Forward P/E	16.15

Company Performance Highlights

Operating Margin:	19.1%
ROA:	14.2%

Financial Ratios

Current Ratio:	0.91
Debt to Equity:	0.39%
Days Inventory Turnover:	125.94

Target Price: $645 - $655

Current Price: $627.48

Drivers of Thesis

- AutoZone has an unsustainable capital structure. They have negative equity on their balance sheet as a result of their excessive share buyback program and thus have a greater amount of liabilities than assets.
- Amazon has recently became a strong competitor. With auto part shoppers transitioning to the internet, AutoZone will find it difficult to spur demand given its poor online presence and higher cost structure.

Risks of Thesis

- AutoZone’s 180 location distribution network gives them the ability to quickly capture demand and decrease costs.
- AutoZone has penetrated markets that may be immune to the Amazon effect as a result of poor internet infrastructure. This will give them time to continue expanding and establish themselves as a brand leader before companies like Amazon are able to access the space.

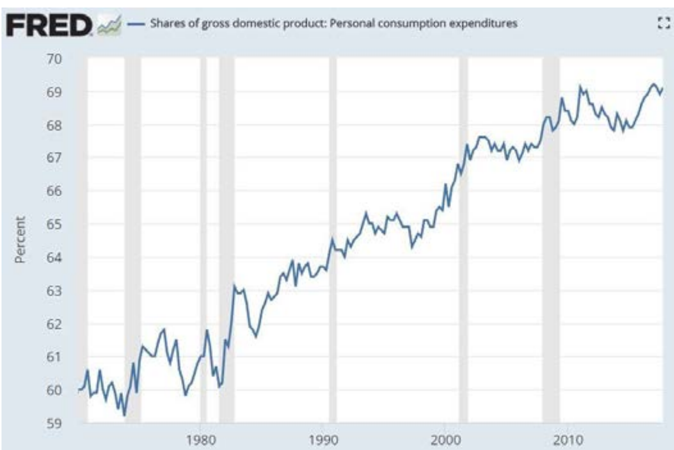
One Year Stock Performance

Source: FactSet[1]

Macroeconomic Outlook

Real Gross Domestic Product

Real gross domestic product is the value of all finished goods and services produced in a country over a period of time. This metric is often used as an indication of the health of the economy. Real GDP increased at a CAGR of 3.16% and 2.89% in quarter three and four of 2017.[2] These values are relatively strong compared to the average 10 year CAGR of 2.11%.[2] As reflected in the graph below, consumer spending currently accounts for roughly 70% of real GDP.[2] We expect spending as a percentage of real GDP to remain at current levels. Since people drive cars in both good and bad economic times, the auto parts industry has a certain defensive nature to it. Never the less, stores such as AutoZone still have a discretionary aspect to their product offerings. We view changes in real GDP as a signal for the direction of the consumer discretionary sector, while recognizing that the automotive aftermarket parts industry has a defensive cushion to their business model.



Source: Fred [2]

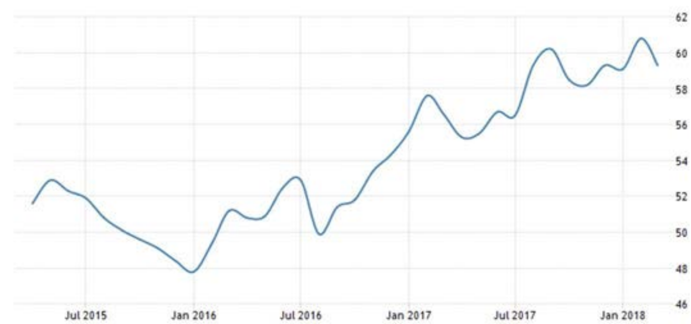
Forecast

The FOMC's median forecast for 2018 is 2.7%, followed by a gradual decrease to 1.8% in the long run.[3] We view these forecasts as overly pessimistic in the short run and agree with their long term outlook. As a result of increased investment, low unemployment, and projected wage gains, we expect GDP to be 3
% in 2018. We assume economic growth will gradually decrease over the next 3 years, hitting 1.8% by 2021. Our optimism primarily comes from the stimulus we expect recent tax cuts to provide. The current administration enacted a tax overhaul which began in January 2018, reducing the corporate tax rate from 35% to 21% and reducing personal income taxes across the board. The lower tax rates will increase investment in the U.S. and supply households with more discretionary income. In the long term; we view interest rate changes and a decrease in savings as the primary contributors to a lower real GDP growth rate.

Investment and Production

The Institute for Supply Management (ISM) comes out with a report each month detailing the month to month activity of the private sector economy.[11] They create the PMI index which shows what the demand for production is in America by tracking variables such as output and new orders. Demand for manufacturing increases when companies and consumers have more money to spend on inputs and household items. Typically, a reading greater than 50 signals increased economic activity. The PMI hit a 5 year high of 60.8 in February 2018[5]. Current level is 59.3, which remains above last year's average of 57.5. [4]

PMI INDEX



Source: ISM [4]

With new orders, production, and employment still growing, we expect levels to remain elevated at 58-60 throughout 2018. The optimism surrounding ISM is a good sign for business. More money will travel throughout the economy in the coming year and into the pockets of households.

Unemployment

The unemployment rate is the percentage of unemployed persons in the labor force. A healthy rate of natural unemployment is considered to be 5%.[35] Since the financial crisis the unemployment rate has decreased from 10% in 2010, to a current rate of 4.1%.[6] The economy has been gaining momentum and we view recent tax cuts will be a positive stimulus to an already thriving business environment. Companies such as Apple have promised to create 20,000 new jobs,[6] and foreign companies are increasing greenfield investments in the United States.[7] In considerations of the expected increase of economic activity in 2018 we expect unemployment to hit 4.0% this year. As unemployment decreases further, there will be an increased number of people receiving a stable income and thus more people will be able to purchase products at AutoZone.

Wage Gains

Contrary to the positive rhetoric regarding unemployment levels, the downward pressures on wages from the recession of '09 have remained throughout the recovery. In quarter 4 of 2010, year over year nominal wage growth was 2.5%. In quarter 4 of 2017 it was 2.4%.[8] These growth rates are small relative to the 4% we were experiencing before 2008.[8] When workers are not getting large increases in pay, they are not encouraged to increase their spending. However, we have just begun to see some upward pressure on wages and thus increased space for discretionary spending. This is shown in the graph below. In March 2018, Personal income increased for the fourth straight month at .4%. [2]

Source: Fred [2]

Given the increase in investment, tight labor market, and current phase of the economic cycle, we expect monthly personal income growth to be in the range of .4% and .6% throughout 2018. The stability and growth in wages will give consumers confidence in their spending habits and find themselves more willing to use money for discretionary spending.

Savings

As of February 2018 household savings was at 3.4% of income.[2] We view this as unsustainably low given the amount of household debt in America. Below is a graph showing household debt to income the Fed released in January. It is gradually nearing 100%.[9] In order to pay off this debt we expect consumers will start to hold off on their discretionary spending. Recent data released by Bloomberg is evidence of this. Personal Income increased .4%[10] while consumer spending increased only .2%[10], the net value representing a slight increase in savings. We feel this is the beginning of a savings trend and expect the savings rate to increase to 4% by the end of 2018 and 6% by 2020.

Source: Federal Reserve[9]

As consumers begin to save more they will have less money to spend on products from companies like AutoZone. We feel these impacts will be felt starting in 2019 and going forward.

Interest Rates

Interest rates play a key role in stimulating or slowing down the economy. With higher interest rates savings tends to increase and borrowing tends to decrease. Low interest rates trigger the economy; encouraging borrowing and spending.

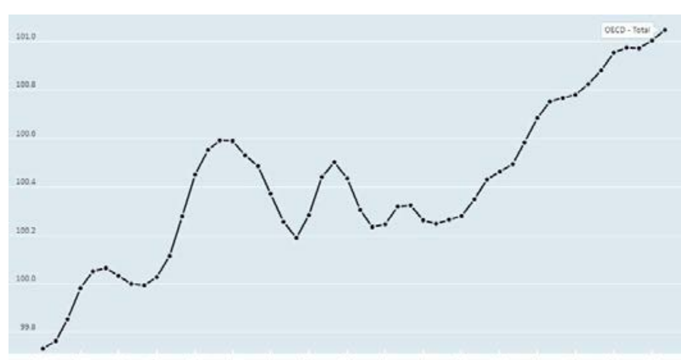
The Federal Reserve has a large influence on interest rates. They use their influence as a means to achieve inflation and unemployment target rates. Inflation can be measured using the Personal Consumption Expenditure Excluding Food and Energy (PCE). The index had a CAGR of 1.5% in 2017.[2] Going forward, the Federal Reserve expects inflation to increase to 1.9% in 2018 and 2% in the longer term.[3] This is indicative of continued economic activity and therefore a signal of more rate increases soon to come. Due to our growth expectations, we agree with the Federal Reserve's outlook on inflation and are assuming 4 interest rate increases in 2018.

Increases in interest rates put downward pressure on consumer spending because savings will provide a greater return. Businesses may also be more hesitant to borrow since their cost of capital will be going up. However, we feel the increase in interest rates and new saving habits will not create a complete reversal of spending and borrowing in 2018.

We see the incremental increases in interest rates as a necessary means to prevent an unexpected spike in inflation. We are confident that the consumer discretionary sector will benefit from a responsible Federal Reserve preventing any economic disruptions. In the long term, as interest rates are normalized to prevent any overheating, the economy will begin to realize the costs associated with borrowing and households will continue to be incentivized to save. This will decrease investment and consumer spending, resulting in headwinds for the consumer discretionary sector.

Consumer Sentiment

Consumer confidence is a measure of respondent's opinions on business conditions, income growth, and job availability.[11] The consumer confidence index is a key indicator for the consumer discretionary sector. With a more confident consumer comes a greater willingness to spend. Historically, consumer confidence increases during expansionary periods. Consumer confidence hit an 18 year high of 101.05 in February of 2018 followed by a value of 97.8 in March.[11] We attribute the decrease of confidence to trade negotiations with China.



Source: OECD[11]

Consumers and investors became worrisome when talks of a trade war came about. This would increase costs for business and be good for the economy. Recently, we have witnessed changes regarding trade. President Xi has announced widening markets access to China.[36] We expect confidence levels to elevate back to be between 98 and 102. With continued employment and wage gains, we feel the index will remain at roughly 101 levels throughout 2018, reflecting a confident consumer willing to spend money.

Capital Markets Outlook

A relatively new occurrence within the markets is the rise in volatility. A 20% drop in the VIX shook the markets on February 6, 2018 and since then stocks seen a greater level of volatility. We feel that volatility will remain a factor as long as the current administration retains protectionist position on economic development causing disruption to a historically stable domestic balance of payments. Furthermore, we expect uncertainty surrounding the expected probability of interest rate increases to factor into market volatility. As interest rates rise so will the attraction for fixed-income instruments. We expect large sums of liquidity to transfer from equities to fixed-income securities as interest rates increase.

Industry Analysis

Industry Synopsis

GICS classifies AutoZone as a specialty retail company.[37] More specifically, they operate in the automotive aftermarket parts industry. Companies within the industry sell products for consumers that want to improve the look or functionality of their vehicle. Since there are many types of auto-vehicles, as well as many components within them, there are a multitude of products that these companies sell. For example, AutoZone offerings range anywhere from hitches for towing to typical car batteries.[17] Furthermore, we view the industry as mature due to the long history and low amount of change within the industry. The average revenue growth rate for AutoZone over the past 10 years has been near 6%, signaling low prospects for high growth. People will always need to maintain vehicle quality on account of safety. We expect to continue seeing revenue growth between 3-6 % and high stability within the industry. In the long term, we are predicting less supportive economic conditions. The industry will maintain stable profits in the downturn on the presumption that people will still need to maintain vehicle quality even though they will have less money to spend. Never the less, companies should still maintain awareness as threatening players enter the market and new trends arise.

Product lines

There are three kinds of products companies within the industry usually offer. This includes tire repair, maintenance such as windshield wipers, and discretionary such as air fresheners. We identify the first two product lines as the defensive side of the business, while the latter is clearly recognized as discretionary in nature. Roughly 70% of products sold within the industry are needs-based.[18] Needs based buys are a result of a problem with the car that the consumer wants to fix. Therefore, we feel quality plays a certain role in consumers purchasing decisions. Products must be able to deliver the intended results.

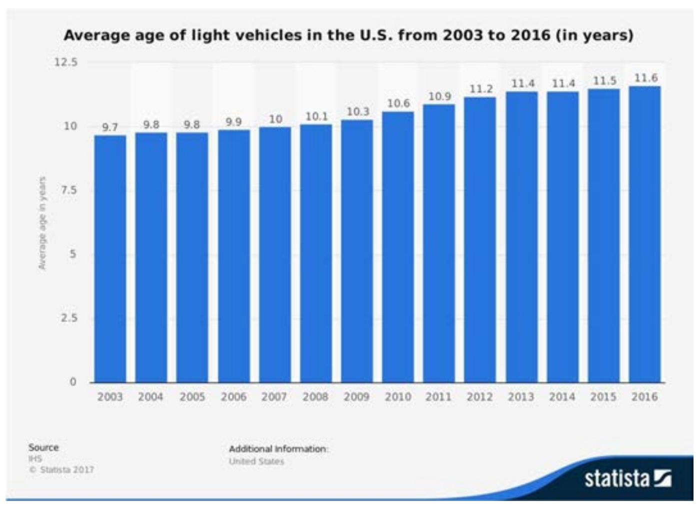
Revenue Stream

Companies sell their products in store or over the internet. Broadly speaking, their customer base is either commercial or household. Commercial customers include auto repair men such as mechanics. They will usually purchase products in bulk or subscribe to commercial services that auto parts company's offer. Household customers will usually buy of a product or two as a means to improve an aspect of their vehicle. Companies want to capture as much value as possible from each consumer and therefore cross selling is a popular strategy for household customers.

Demand Drivers

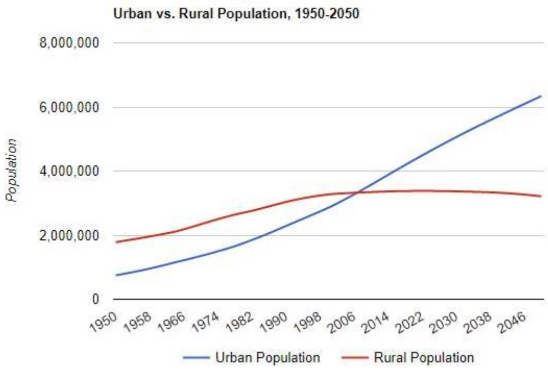
The demand for maintenance and emergency products is predicated off the quality and quantity of vehicles on the road. The industry takes into account factors such as the age of cars and number of licensed drivers. Lower quality and more drivers mean a higher susceptibility to damage and therefore a need to purchase products at auto part locations.

The chart below shows the average age of light vehicles in the U.S. from 2003-2006. Over the past two decades the average age of vehicles has been increasing approximately 1.7% YoY.[14] The increase in the age of the American car fleet will increase the demand for maintenance since older cars are more susceptible to damage. We see this as a tailwind for the aftermarket auto parts industry and believe more people will be buying from auto part locations in the near future.



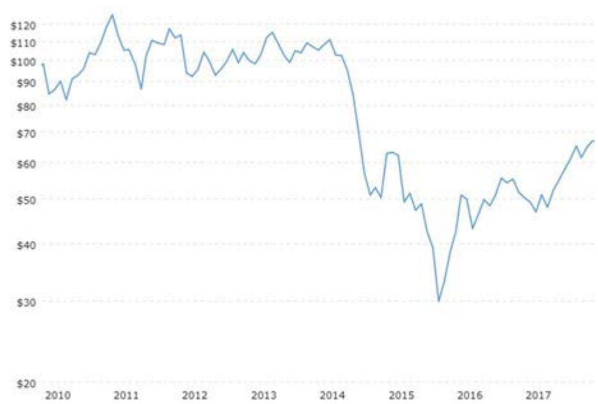
Source: Statista[14]

The number of licensed drivers in the U.S. is another important feature for the industry. According to the Transportation Research Institute; from 1983-2014 there has been a decrease in people of various ages that have a license. This includes a 47% decrease in 16 year olds, a 16% decrease in adults age 20-24, and a 10% decrease in adults' age 30-34.[16] Part of this decline can be attributed to an increased immigration into cities. Below is a graph showing rural immigration into America. There is a projected 55% population increase in cities by 2050.[17] It is much easier to navigate in a city without a car because there is accommodative transportation such as transit.



Source: United Nations, Department of Economic and Social Affairs[17]

Oil has a large impact within the industry. Elevated prices of oil discourage people from driving as much and thus have less ware on their vehicles. This decreases the demand for emergency and maintenance products. Occasionally, companies like AutoZone will purchase fuel swaps as a means to hedge against oil prices rising.[27] The below shows the WTI Crude oil price.



Source: Macro Trends[13]

Oil prices are a function of supply and demand.[29] OPEC has lots of influence on this and therefore oil prices. OPEC plans on decreasing oil production in 2018. Crude oil has increased 40% since August 2017 and is at a price of $66.7 as of April 16th, 2018.[20] Analysts from JP Morgan forecast oil to hit $70 in 2018.[28] We do not have the expertise to predict this ourselves and will refer to their prediction as to where we believe oil prices will go. However, oil prices are extremely sensitive and we cannot forecast a sudden change in price trends in the event something impactful occurs.

Stability Factor

The current implications of the aging of car fleet, number of licensed drivers, and rising oil prices are a few of many factors which point to the stable nature of demand for auto parts. Over the long term we feel there will always be aspects of the economy which hinder or encourage theneed for auto repair. Yet, we do not foresee a change in the industry that will bring about a product or trend which creates an exponential growth in demand.

Recent Developments

Supply Chain Technologies

A primary means of profitability is an efficient supply chain network. Companies want to hold optimal inventory levels and deliver them quickly when there is demand. Each year technological improvements come about to improve supply chain integration. For example, the adoption of radio frequency identification technology (RFID) gives a company the ability to easily monitor products in the supply line.[30] The table below represents a cost-benefit analysis for RFID performed by the Danby Research Group. Through experimental design, they found RFID technologies brought about cost savings of between $15,000 and $150,000 dollars.[21] The larger companies operate their own distribution centers. We expect products like RFID to continue improving the efficiencies of the various distribution networks across the industry.

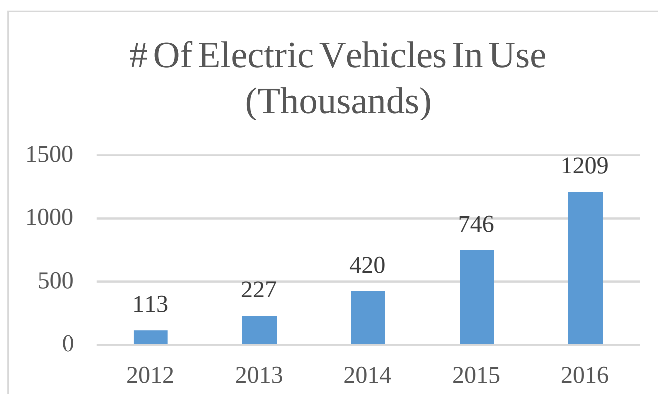
Number of Assets	Number of Reads per Asset per Year	Annual Labour Cost for Barcode	Annual Labour Cost for RFID	Annual Cost Benefit
10,000	14.11	$12,721.70	$1,361.96	$15,064.00
20,000	14.57	$26,273.45	$2,812.79	$23,685.80
50,000	16.06	$72,398.94	$7,750.90	$65,254.07
100,000	18.71	$168,700.81	$18,060.81	$150,640.00

Table 1: Annual Cost Benefit compared to number of assets

Source: Danby Group [21]

Electrification of Vehicles

As America becomes more focused on sustainability, the electrification of cars becomes more popular. We have witnessed an almost 1,000% increase in electric car use across the globe.[14] This presents both a threat and opportunity to traditional auto parts companies. If companies manage to leverage this trend and place a focus on electrification, they may capture demand by efficiently adding components such as electric car batteries to their supply chain.



Source: Statista[14]

Competitive Landscape

The global automotive aftermarket is a $360 billion dollar industry.[32] With $10 billion in revenues, AutoZone is a small piece of the pie on a global scale. Never the less, it is a revenue leader and we therefore presume a majority of companies within the industry are small businesses. AutoZone, Genuine Parts Company, O'Reilly, and Advanced Auto Parts are of the few that managed to successfully scale and establish themselves as market leaders. Advanced Auto Parts and O'Reilly Inc. core businesses are the aftermarket auto parts retail market.

Therefore, we view them as primary competitors to AutoZone. Seeing that Genuine Parts Company generates revenue beyond that of auto parts sales, we identify them as a secondary competitor.

Differentiation

The primary ways in which firms compete is through pricing and customer service. The function of products sold within each company are homogeneous. Companies constantly work to maintain and improve margins in order for them to stay price competitive. A firm with lower distribution costs is capable of charging a lower price than another less efficient firm and thus able to attract customers. At the same time, branding is damaged when a customer has a bad experience with a product. Reliability plays a factor in a company's ability to appropriately price their products.

Furthermore, vehicles can be complicated for an average consumer. This creates an incentive for them to shop in the store with hopes of gaining an understanding of how a product works and get exposed to a company's customer service. According to time trade's research, 54% of consumers most highly value prompt service in the retail industry.[18] This is especially relevant in an industry requiring in-store experiences to understand the product.

Porter's 5 Forces

Rivalry among Existing Competitors: Moderate

Firms operating within the retail auto-part industry are very mature. The primary source of growth within the industry comes from acquisition and location growth. There are only a few main competitors in the industry due to the high barrier to entry. Firms compete on the basis of customer service and location.

The main advantage to the retail auto-parts business model that has largely shielded the industry from the Amazon effect is service. Employees in the industry are referred to as specialists. This is because they are trained to help diagnose, find, and install the right part for you. Employee retention is a crucial factor in determining the quality of service because long-term employees generally experience a higher quality of job satisfaction and are better able to serve the customer. AutoZone, O'Reilly and Advanced Auto Parts have 53,070, 45,440, and 40,000 full- time sales staff respectively.

In order to successfully maintain a competitive advantage and generate returns to shareholders competitors AutoZone and O'Reilly run a vast expansion program. AutoZone however is the only firm expanding abroad. With 524 locations in Mexico they have already begun to establish themselves as a trusted brand. Additionally, once a firm builds a new location there is no incentive for another firm to build in the same location. This why there is a focus in the industry on expansion by acquisition and or by new development.

Threat of Entry: Low

In order to establish a successful retail auto-parts store the business must first access parts inexpensively and have the logistics necessary to track supply and inventory. RFID is inexpensive but storage and shipping costs can run costs up quickly. It requires significant economies of scale to purchase auto parts wholesale and deep pockets to run an inventory management system well enough to reduce costs and compete on the basis of price with large and established businesses like AutoZone and O'Reilly.

Threat of Substitutes: Moderate

Consumers can access hundreds of common auto-parts on the internet. They can easily cross-compare the products and read reviews to make the best purchasing decision. This is known as the Amazon effect and the auto-arts industry is not excluded. However, more complex parts and certain model specific parts can be harder to find on the internet and require the use of a specialist.

Power of Buyers: Moderate

Many parts are irregular and customers lack the knowledge to apply argue for a more competitive price. Customers will simply purchase a part because it is necessary for them to use their car on a daily basis. With that said, customers typically purchase out of necessity. People will postpone purchases during poor-economic times because they believe they can spend their money more wisely elsewhere. Other consumers will chose to do the job themselves rather than use a professional.

Power of Suppliers: Low

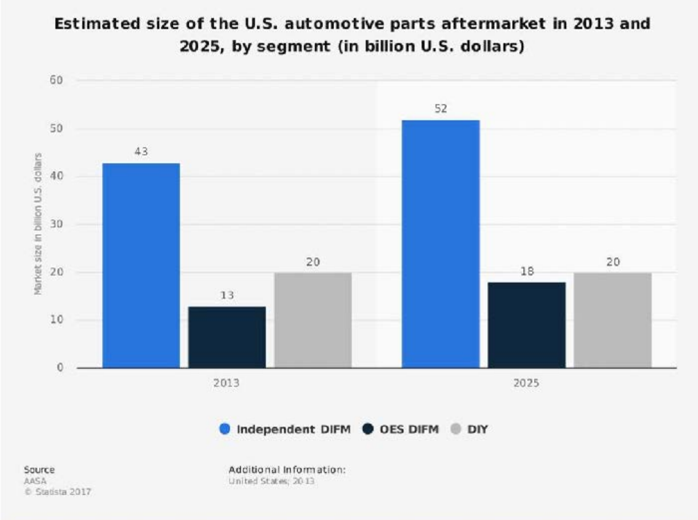
Auto-parts are manufacturers have very high fixed costs which require them to produce parts on a large scale in order to turn a profit. It is more common for a parts manufacturer to increase production capacity and reduce costs than create a differentiated product that performs better than competition. For this reason, suppliers are often cost leaders. Businesses like AutoZone and O'Reilly have very low switching costs so manufacturers must either offer costs savings or run the risk of losing business.

Catalyst for Growth / Change

Transition to D.I.F.M.

As consumers place a larger value on convenience, they are willing to pay for people to do tasks they find annoying, such as repairing a car. There is a shift in consumer repair habits toward more "Do it for me" (DIFM) as opposed to "Do it yourself" (DIY). The DIY consumer is willing to buy an auto-repair part and replace it themselves. Whereas the DIFM customer will pay a mechanic to fix their car. We expect this to place downward pressures on household customer sales growth since more people will chose a repair man over buying a product to fix a car themselves. However, this also presents an opportunity for companies to capitalize on their commercial strategy. With a greater demand for repair men comes a greater demand for auto parts from maintenance shops and independent mechanics.

The graph below represents the trend. By 2025 the DIFM segment is expected to increase 20% in size. Whereas the DIY segment is expected to remain at current levels of $13 billion. Moving forward, we expect companies in the industry to strategize around building a larger commercial consumer base.



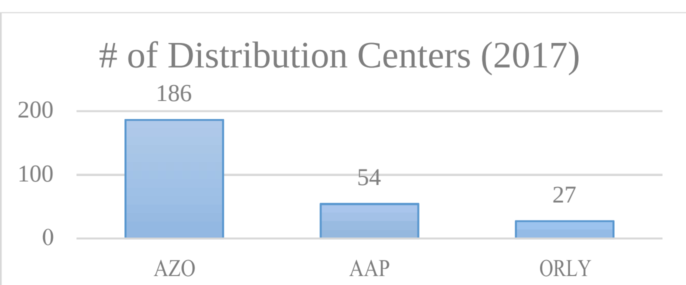
Source: Statista[14]

Advent of autonomous driving

Lyft recently teamed up with the company Magna, a major automotive supplier to build self-driving cars.[31] Google, Tesla, and Uber have also made strides toward establishing autonomous cars as one of the primary means of transportation. We currently view autonomous vehicles as a downside for the industry. We have yet to see any major auto part retailers make steps toward tailoring their business to an autonomous trend down the line. However, we feel there is still upside potential. With new autonomous cars comes a new set of auto parts that could prove too complicated for an average user or mechanic. Companies such as AutoZone could attempt to sell products or services that fix autonomies cars for confused drivers. Within the next ten years we expect autonomous cars to be one of the primary means of transportation.

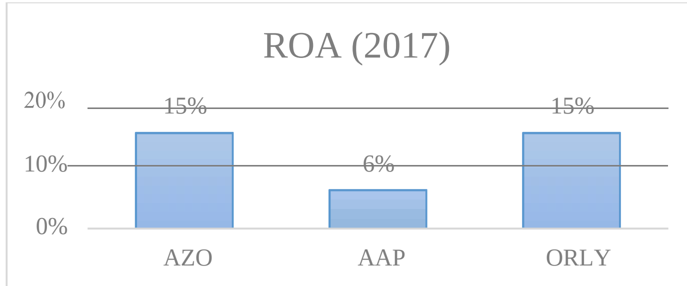
Key Metrics

The aftermarket auto parts industry places a large emphasis on efficient product distribution. A company with a weak supply chain will incur a greater amount of costs and may face instances where it is unable to meet demand. The graph above is representative of AutoZone's vast hub network. Whereas Advanced Auto Parts and O'Reilly receive products directly from their distribution centers, AutoZone has a network of mega stores that keep stock and provide product to stores that immediately need it. We find this to be supportive of AutoZone's supply chain capabilities.



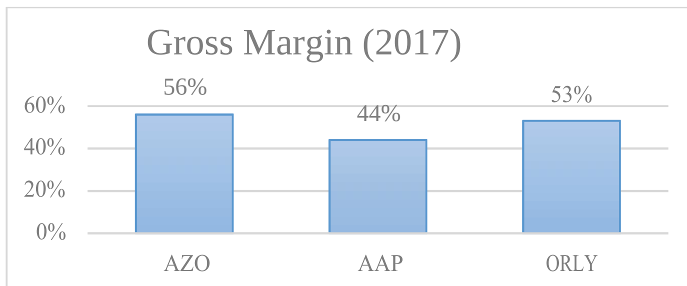
AutoZone 10-k[24], Advanced Auto Parts 10-k[26], O'Reilly 10-k[27]

Return on Assets is calculated by dividing net income over the average amount of total assets. As stores are leased or constructed and inventory is purchased, companies are expected to efficiently put such line items to use. For example, leasing out a new location that generates a poor amount of revenue but requires lots of capitalized costs will generate a low ROA. Advanced Auto Parts seems to be lacking operationally while Auto Zone and O'Reilly generate similar returns.



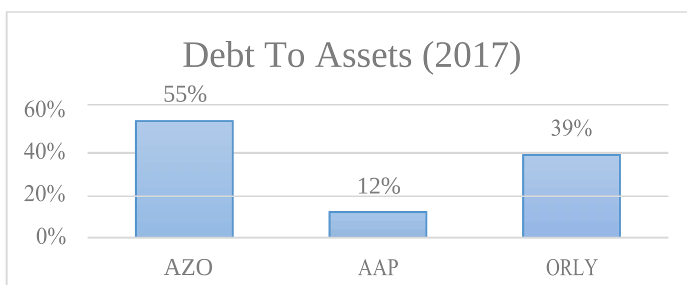
AutoZone 10-k[24], Advanced Auto Parts 10-k[26], O'Reilly 10-k[27]

Gross Margin is measured by dividing gross profits by revenues. In the auto parts retail space, gross margin is indicative of efficient use and delegation of their inventory. AutoZone's high Gross Margin aligns well with our optimistic expectations regarding their distribution network. We expect AutoZone to continue outperforming peers in this area.



AutoZone 10-k[24], Advanced Auto Parts 10-k[26], O'Reilly 10-k[27]

The Debt to Asset ratio shows how much debt is on a firms balance sheets relative to its assets. AutoZone leads the industry with the amount of debt it has in relation to its assets. AutoZone's strong margins give it space to take on such debt. However this vast amount of debt is seen as unsustainable. We expect AutoZone's debt to asset to drop as a means to hedge against lost profits.



AutoZone 10-[k24], Advanced Auto Parts 10-k[26], O'Reilly 10-k[27]

The following table represents the growth rate in the number of people who shopped at each of the respective auto parts stores. For example, 20 million people claimed they shopped at O'Reilly Auto Parts in 2010, whereas 38 million claimed they did in 2017. This is a growth of 80 %. We feel this helps indicate what companies have a favorable in store experience. With AutoZone divesting their online and OEM business segments, we expect an increase in in-store visits to AutoZone stores.

	In-Store Customer visit 7 yr. Growth Rate
ORLY	80.40%
AZO	24.65%
AAP	12.54%
NAPA	-18.50%

Source: Statista[14]

Company Analysis

General Information

With the largest amount of stores in North America, AutoZone managed to claim first place in the Aftermarket Business World Top 25 Auto Chain Report for the third consecutive year in a row in 2017. This is reflective of their strong domestic presence. However, they have established themselves abroad as well. In total, AutoZone has 5480 domestic stores, 529 stores in Mexico, and 14 stores in Brazil.[24]

	P/E 18	Est. 5yr EPS gr.	P/B
AAP	16.70	21.74	46.19
ORLY	15.66	165.42	7.75
GPC	15.45	0.47	23.27
AVG.	15.94	62.55	25.74
AZO	14.88	-0.09	-0.42

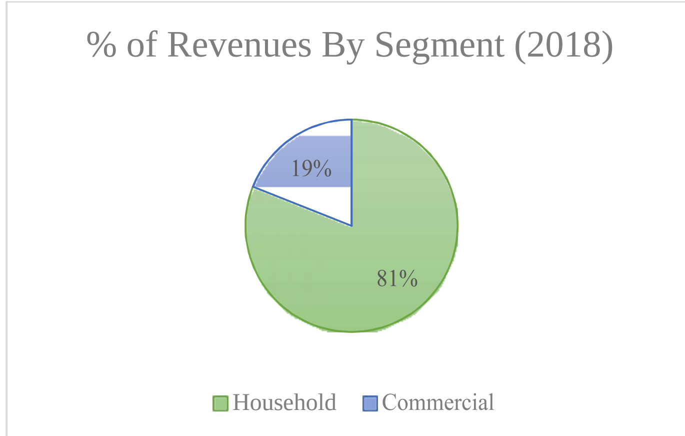
The company started in 1968 as a major wholesale retail grocery chain. On July 4th, 1979 CEO J.R. Hyde shifted the trajectory of the company to focus specifically on specialty retail sales including the opening of the first specialized motorist store Auto Shack™. The company went public in 1991 under the ticker "AZO" and since then has expanded to become one of the most well-known aftermarket auto part retailers firm in the industry.[17] AutoZone currently has sights sets on increasing efficiency in its distribution centers, increasing its commercial reach, and expanding through the U.S., Mexico and Brazil. They highly value customer support and the in-store experience.

Business Segments

Auto Zone operates primarily in the retail environment with 6023 brick and mortar locations.[24] They utilize Omni-channel distribution strategies and have websites catered to their household and commercial consumers. They also have a small software business called ALLDATA which acts as a repair consultant and educator for their commercial customers.[24]

Divestiture

In 2018 AutoZone recognized a $147 million impairment charge from divesting an online segments, Auto Anything, and original manufacturing parts business, IMC.[32] The divestiture came as a result of continued unprofitability. We feel the divestiture will give AutoZone more space to focus on their core business going forward.



Source: Seeking Alpha[32]

Commercial

AutoZone captures commercial sales through their various commercial programs such as AutoZone pro and ALLDATA. They provide commercial credit and prompt delivery of parts to local, regional, and national repair garages, dealers, mechanics, etc. They also provide diagnostic and repair software for their commercial customers.[32]

Retail

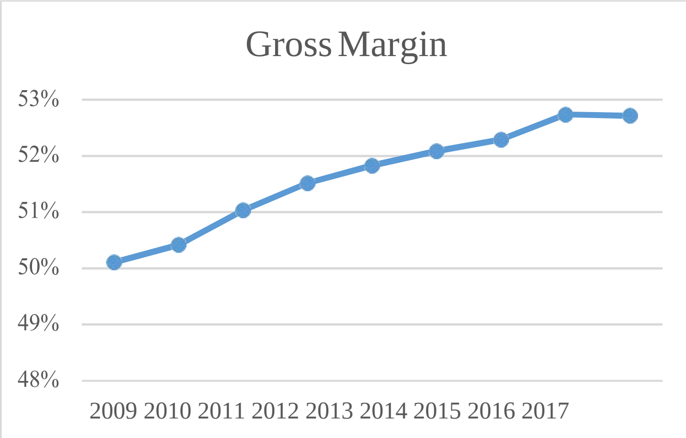
AutoZone derives most of its revenue from its in-store customer purchases. AutoZone still has an e-commerce business AutoZone.com. However, they prefer people to place orders online and pick them up in-store. Through this process AutoZone can generate additional in-store sales and establish brand loyalty by displaying strong customer service.

S.W.O.T.

Strengths

Distribution capabilities

AutoZone has an efficient, multi-frequency delivery network consisting of 180 distribution hubs. These are regional in nature and help improve optimal stock levels while meeting demand. AutoZone's delivery network supplies them with flexibility in maintaining and distributing inventory, thus providing customers with any product required. We feel they have realized these benefits as margins have increased from 50.103% to 52.730% over the past 8 years.



AutoZone 10-k[24]

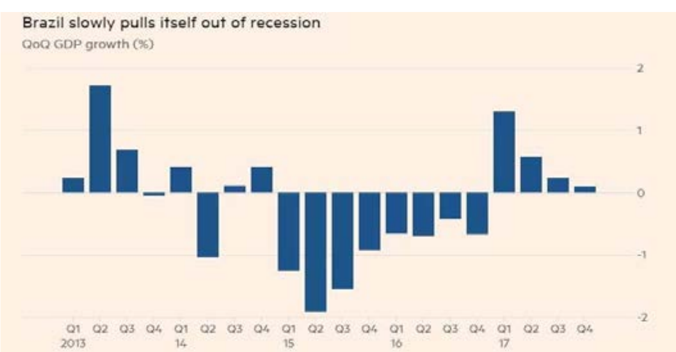
Relative to pure play firms, we feel AutoZone will continue to outperform in distribution performance and maintain 2017 margins going forward.

International Presence

AutoZone has 524 locations in Mexico and is expected to open 40 new ones in 2018.[32] Mexico is also the 11th most populous country in the world.[17] Napa Auto Parts only has 4 stores in Mexico and Advanced Auto Parts has less than 400. O'Reilly has zero. The automotive aftermarket in Mexico is approximately four billion dollars and is projected to increase 5-7% in the next 3 years.[17] We believe this will be the primary factor driving revenue growth going forward.

Brazil is another country of interest to AutoZone. They currently have 14 stores in the country and expect to open up 10 more headed into 2018.[32] They entered Brazil in 2012 at a time of political uncertainty, taking a risky but reserved bet on its future growth. AutoZone's 70% increase in Brazil store openings throughout 2018 is indicative of expected growth moving forward.

We see AutoZone's strong presence in these countries as a way to hedge against the Amazon effect. As of 2016, Brazil's internet penetration rate was 40 %[14] and Mexico's was 64%[14]. With less users able to access the internet there are less possibilities for Amazon to take away market share from AutoZone.



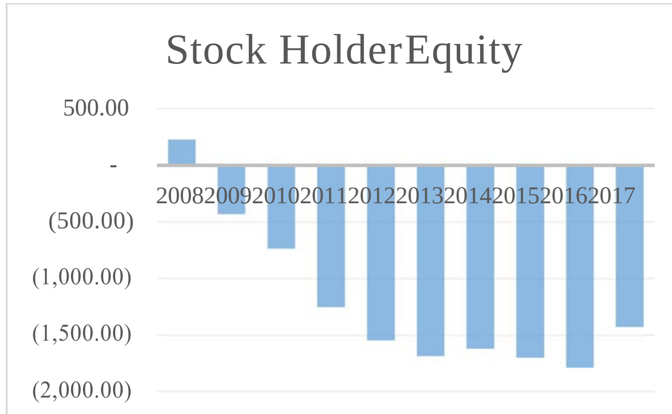
Source: Factset[1]

Above is a chart of Brazil's GDP the past 5 years. It remained positive through all of 2017 and the IMF has projected their GDP to grow 1.9% in 2018.[34]

Weaknesses

Capital structure

We feel AutoZone's primary weakness is their capital structure. They have gone into high amounts of debt to fund their share buyback program. AutoZone has repurchased $18.7 billion in common stock since 1998 to provide returns to their shareholders.[33] In January of 2018 the board approved another $1 billion in repurchases. Since 2009, AutoZone has had negative equity on their balance sheet and thus a greater amount of liabilities than assets.



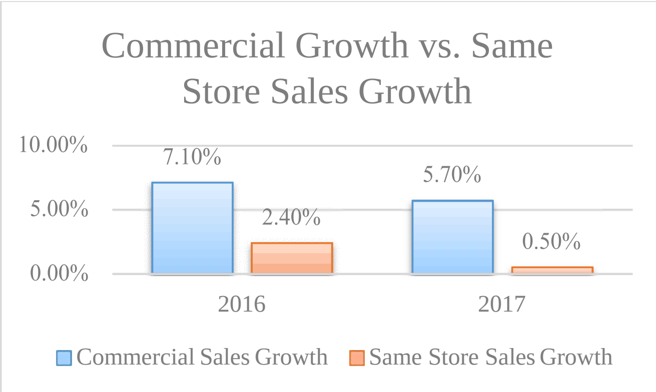
AutoZone 10-k[24]

The program is financed via investment grade debt. We do not believe that this buyback program is sustainable in the long term. We primarily feel this way because of AutoZone's obligations and possible profitability decline in the future. Should AutoZone realize losses through instances such as Amazon taking market share it will be unable to dedicate resources toward more share buy-backs. We feel this is a very likely scenario and expect AutoZone to normalize their capital structure to levels at least above an asset: liability ratio of 100%. We believe the halt in their share purchasing program has the potential to bring down their stock price.

AutoZone 10-k[24], Advanced Auto Parts 10-k[26], O'Reilly 10-k[27]

Opportunities

Commercial Growth



Above shows 2 growth metrics for AutoZone. The growth out of same store sales primarily comes from household customers. We are seeing consumer habits switching to “Do it for me” as well as shopping more on the internet. This makes the U.S. same store sales segment a low growth area since e-commerce and new repair trends diverge away from purchasing in-shop. AutoZone has gradually positioned themselves to appeal to the commercial consumer. They have trademarked their Pro Vantage loyalty program which is a part of its online ALLDATA business.[38] The program provides commercial customers with access to an educational data base that helps them improve upon their business. AutoZone also has a commercial program which provides commercial credit and prompt delivery of parts and other products to local, regional, and national repair garages, dealers, mechanics, etc.

In 2018 AutoZone is expected to open 150 new commercial programs.[32] We believe they will continue to experience commercial sales growth of between 5-7% for the next three years.

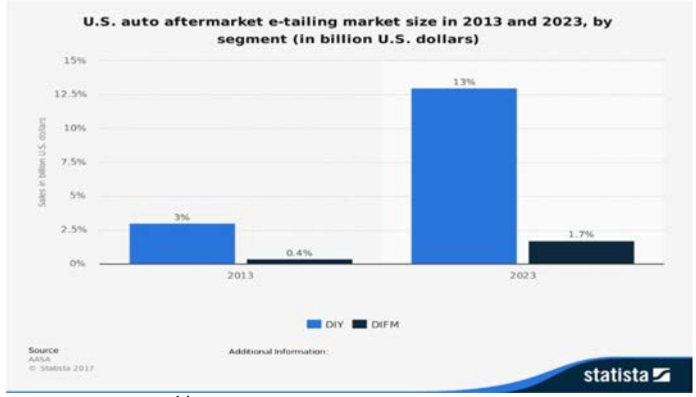
Threats

Wage Pressures

With a tightening labor market, AutoZone has been experiencing gradual wage pressures over the last several quarters. Since substitution comes easy, AutoZone has to remain price competitive for their consumers. However, AutoZone also heavily relies on service. If they want to maintain a strong service oriented business they will need to offer competitive wages to attract the best people.[32] In fourth quarter 2017 AutoZone increased their SG&A as a percentage of sales 30 basis points.[39] We foresee wage pressures remaining and SG&A as a percentage of sales increasing 2% next year.

Amazon

AutoZone just recently sold its unprofitable online business, placing a primary emphasis on in-store shoppers. This comes at a time when Amazon announced entranced into the auto parts marketplace in 2017.[23] The graph below reflects the forecasted market size for the U.S. auto aftermarket online business.



Source: Statista[14]

We feel this plays the biggest threat to AutoZone’s revenues. Amazon’s scope gives it the ability to operate in a segment with razor thin margins while remaining sustainable. This is reflective in current price comparisons. A RedTop Optima car battery that sells for $216 at AutoZone is listed on Amazon for $166.[23]

Furthermore, the top two market share leaders in online auto parts weren’t any specialty retail auto parts stores. Rather, they were Amazon and EBay.[23] This should be of concern considering Amazon began placing focus on auto parts just this past year, yet already managed to capture more market share online than any other auto parts retail company. [23] We do not feel AutoZone has the expertise to properly utilize its Omni-channel distribution to fend off the likes of Amazon. We expect sales will decrease as a result of Amazon’s entrance.

Valuation Analysis

Revenue Growth

Revenue is a function of sales from their AllDATA / E-commerce businesses and their auto parts location business. The AllDATA / E-commerce business is given a growth rate while the auto parts business is computed by multiplying the number of stores by revenue per store. Online revenue initially dropped as a result of AutoZone’s writing off part of their online segment. AutoZone also has commercial and household consumers. They are represented separately in our revenue break downs as a means to show how much each consumer base provides to revenue. We expect AutoZone’s commercial business as a percentage of revenues to increase while a portion of their household consumers change buying habits. AutoZone growth rate are 3.28% in 2018 they decrease from there. Our low growth outlook is attributable to our expectation of lost market share to Amazon as well as the industries lagging growth prospects.

Cost of Revenues

AutoZone is a leader in gross margins when compared to pure play competitors. They hit a peak in efficiency margin rate in 2017 and we expect levels to remain there going forward.

Selling General & Administrative

AutoZone faces wage pressures as demand for employment is outstripping supply. We therefore forecast SG&A expenses to increase 2% next year.

Capital Structure

AutoZone positioned their capital structure such that their liabilities are greater than their assets. This is a product of their $18 billion dollar share buyback program. We view this as unsustainable and identify their capital structure to be the biggest risk of our investment thesis.

Beta

Bloomberg's 5 year weekly raw beta for AutoZone is .77. Due to our pessimistic viewpoints on their financing, we feel a beta of .77 does not properly reflect the risks associated with AutoZone. Therefore, we have added an additional .3 to their beta to reflect such risk. We have AutoZone's beta at 1.07.

Cost of Debt

We calculate AutoZone's cost of debt by adding the default risk associated with their BBB S&P bond rating to the risk free rate. The risk free rate is the 3.07% rate associated with a 30 year treasury bond.

Cost of Equity

We used the Capital Asset Pricing Model to calculate AutoZone's cost of equity.

Beta (.77 + .3) = 1.07

Market Risk Premium 4.6%

Risk free rate 3.07%

As AutoZone continues to finance inefficiently, we expect the cost of equity to remain at or above the current premium levels.

WACC

We implemented a WACC of 6.58% in our models. This includes an equity market weight of 71% and market weight of debt of 29%.

Valuation Models

Our primary means of modelling included DCF and Economic Profit valuations, relative valuations, and dividend discount model.

Dividend Discount Model

We valued AutoZone at $400.3 using the dividend discount model. AutoZone does not pay a dividend and we do not believe this properly reflects AutoZone's intrinsic value.

Discounted Cash Flow and Economic Profit Model

We calculated AutoZone's price using the discounted cash flow and economic profit model and computed a price of $737.98. We believe this to be too high of a value of the firm. The increase in beta and low revenue prospects does not fully capture the risks we feel are associated with this firm. Though we recognize positive aspects of the firm's performance such as its ability to enter the Mexican market, we feel the organic returns associated with their performance are not justifiable to its price. Rather, the majority of expected returns associated with this stock are the product of excessive stock purchasing and debt creation.

Relative Valuation

Our relative valuation analysis paints a clearer picture for the type of firm we see AutoZone as. They have a negative 5 year growth rate and lower p/e to that of their comparable. We feel the low p/e is justified given the various risks associated with the firm. We expect markets to continue placing a discount on AutoZone.

Sensitivity Analysis

Receivable/Sales vs. VC Growth of NOPLAT

We tested the CV Growth of NOPLAT vs. Accounts Receivables/Sales to observe how price was affected by these changes. We found that the price is much more sensitive to CV Growth of NOPLAT due to the fact that NOPLAT is a value driver.

					COGS/SALES growth rate			
	$ 653.81	-1.50%	-1.00%	-0.50%	0.00%	0.50%	1.00%	1.50%
PPE YoY Growth	-2.50%	684.78	673.11	661.44	649.77	638.10	626.42	614.75
	0.50%	686.13	674.46	662.79	651.12	639.44	627.77	616.10
	3.50%	687.48	675.81	664.14	652.46	640.79	629.12	617.45
	6.50%	688.83	677.16	665.48	653.81	642.14	630.47	618.80
	9.50%	690.18	678.51	666.83	655.16	643.49	631.82	620.14
	12.50%	691.53	679.85	668.18	656.51	644.84	633.16	621.49
	15.50%	692.87	681.20	669.53	657.86	646.19	634.51	622.84

COGS/Sales Growth Rate vs. PPE YoY Growth

We tested the COGS/Sales Growth Rate vs. PPE YoY Growth to observe how price was affected by these changes. We found that price was almost equally sensitive to these two values. This is indicative of the large impact of COGS equal to the changes in PPE and depreciation.

					SG&A/Sales			
	$ 653.81	32%	33%	34%	35%	36%	37%	38%
WACC	3.00%	4087.52	3870.93	3654.35	3437.77	3221.19	3004.60	2788.02
	4.00%	2182.23	2061.21	1940.19	1819.16	1698.14	1577.12	1456.10
	5.00%	1403.16	1321.08	1239.01	1156.94	1074.87	992.80	910.72
	6.58%	812.64	759.93	707.22	654.51	601.79	549.08	496.37
	8.00%	531.90	493.02	454.14	415.27	376.39	337.52	298.64
	9.00%	399.26	366.86	334.47	302.07	269.68	237.28	204.89
	10.00%	298.45	270.94	243.44	215.93	188.42	160.91	133.40

Accounts Payable/Inventory vs. Market Risk Premium

We tested the Accounts Payable/Inventory vs. Market Risk Premium to observe how price was affected by these changes. We found that the Market Risk Premium has a greater effect on the price of AutoZone. A change in the market environment will impact a firm's price greater than a change in their operational balance sheet items.

					Accounts Payable/Inventory			
	$ 653.81	96%	101%	106%	111%	116%	121%	126%
Long Term Debt	35.00%	633.53	640.78	648.04	655.29	662.55	669.80	677.06
	45.00%	633.16	640.42	647.67	654.93	662.18	669.44	676.69
	65.00%	632.43	639.69	646.94	654.20	661.45	668.71	675.96
	75.54%	632.05	639.30	646.56	653.81	661.07	668.32	675.58
	80.00%	631.88	639.14	646.39	653.65	660.90	668.16	675.42
	95.00%	631.34	638.59	645.85	653.10	660.36	667.61	674.87
	100.00%	631.15	638.41	645.66	652.92	660.17	667.43	674.68

SG&A/Sales vs. WACC

	$ 653.81	SG&A/Sales						
		32%	33%	34%	35%	36%	37%	38%
WACC	3.00%	4087.52	3870.93	3654.35	3437.77	3221.19	3004.60	2788.02
	4.00%	2182.23	2061.21	1940.19	1819.16	1698.14	1577.12	1456.10
	5.00%	1403.16	1321.08	1239.01	1156.94	1074.87	992.80	910.72
	6.58%	812.64	759.93	707.22	654.51	601.79	549.08	496.37
	8.00%	531.90	493.02	454.14	415.27	376.39	337.52	298.64
	9.00%	399.26	366.86	334.47	302.07	269.68	237.28	204.89
	10.00%	298.45	270.94	243.44	215.93	188.42	160.91	133.40

We tested SG&A/Sales vs. WACC to observe how price was affected by these changes. We found that price is more sensitive to the WACC.

Purchase of Treasury Shares vs. Cost of Equity.

	$ 653.81	Purchase of Treasury Shares						
		0	-400	-800	-1200	-1400	-1600	-1800
Cost of Equity	3.000%	3431.93	3433.35	3434.77	3436.19	3436.90	3437.62	3438.33
	5.000%	1470.34	1471.33	1472.33	1473.33	1473.83	1474.33	1474.83
	6.500%	947.23	948.10	948.98	949.85	950.29	950.73	951.17
	7.995%	651.41	652.21	653.01	653.81	654.21	654.61	655.01
	9.000%	515.29	516.06	516.82	517.58	517.96	518.34	518.72
	11.000%	326.48	327.19	327.89	328.60	328.95	329.30	329.65
	13.000%	201.09	201.75	202.41	203.07	203.40	203.73	204.06

We tested the Purchase of Treasury Shares vs. Cost of Equity to observe how price was affected by these changes. We found that price is more sensitive to changes in the Cost of Equity.

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Important Disclaimer

This report was created by students enrolled in the Security Analysis (6F:112) class at the University of Iowa. The report was originally created to offer an internal investment recommendation for the University of Iowa Krause Fund and its advisory board. The report also provides potential employers and other interested parties an example of the students' skills, knowledge and abilities. Members of the Krause Fund are not registered investment advisors, brokers or officially licensed financial professionals. The investment advice contained in this report does not represent an offer or solicitation to buy or sell any of the securities mentioned. Unless otherwise noted, facts and figures included in this report are from publicly available sources. This report is not a complete compilation of data, and its accuracy is not guaranteed. From time to time, the University of Iowa, its faculty, staff, students, or the Krause Fund may hold

AutoZone

Key Assumptions of Valuation Model

Ticker Symbol	AZO
Current Share Price	$634.52
Par Value	$0.01
Common shares outstanding at the beginning of the last	27
Current Model Date	4/17/2018
FY End (month/day)	Aug. 30

Pre-Tax Cost of Debt	3.80%
Beta	1.07
Risk-Free Rate	3.07%
Equity Risk Premium	4.60%
CV Growth of NOPLAT	1.61%
CV Growth of EPS	4.50%
Current Dividend Yield	0.00%
Marginal Tax Rate	21.00%
Effective Tax Rate	21.00%
WAAC	6.58%
Cost of Equity	7.995%
Cost of Debt	3.80%
cost of leases	3.80%

AutoZone

Revenue Decomposition (in millions)

Fiscal Years Ending Aug. 30	**2015**	**2016**	**2017**
Net Sales	**$ 10,187.34**	**$ 10,635.68**	**$ 10,888.68**
Growth % YoY	7.50%	4.40%	2.38%
Revenue from Auto Parts Locations	$ 9,824.88	$ 10,261.11	$ 10,523.27
Commercial	526.711	790.066	1,351.013
Household	9,660.629	9,845.610	9,537.663
# of stores	5,609.000	5,814.000	6,029.000
Revenue per store (Billions)	$ 1.7516	$ 1.7649	$ 1.7454
% of Revenues	96%	96%	97%
ALLDATA, E-commerce sales	$ 362.46	$ 374.56	$ 365.40
% of Revenues	4%	4%	3%

AutoZone

Income Statement (in millions)

Fiscal Years Ending Aug. 30	**2015**	**2016**	**2017**
Net sales	10,187.340	10,635.676	10,888.676
Cost of sales, including warehouse and delivery expenses	(4,590.390)	(4,729.543)	(4,826.005)
Depreciation and amortization	(269.919)	(297.397)	(323.051)
Gross profit	5,327.031	5,608.736	5,739.620
Operating, selling, general and administrative expenses	(3,373.980)	(3,548.341)	(3,659.551)
Operating profit	**1,953.051**	**2,060.395**	**2,080.069**
Interest expense, net	(150.439)	(147.681)	(154.580)
Income before income taxes	1,802.612	1,912.714	1,925.489
Income taxes	(642.371)	(671.707)	(644.620)
Net income	**1,160.241**	**1,241.007**	**1,280.869**
Weighted-average common shares outstanding:			
Basic	31.560	29.889	28.430
Earnings per share:			
Basic	36.760	41.520	45.050

AutoZone

Balance Sheet (In Millions)

Fiscal Years Ending Aug. 30	2015	2016	2017
Assets			
Current Assets			
Cash	175.309	189.734	293.270
Normal cash	2.101	2.273	3.514
Excess cash	173.208	187.461	289.756
Accounts receivable	247.872	287.680	280.733
Merchandise inventories	3,421.635	3,631.916	3,882.086
Other current assets	121.847	130.243	155.166
total current assets (ours)	3,966.663	4,239.573	4,611.255
Total Current Assets	3,970.294	4,239.573	4,611.255
Property and Equiment:			
Gross, Property and equipment	5,891.707	6,330.115	6,873.193
Accumulated depreciation and amortization	(2,386.075)	(2,596.861)	(2,842.175)
Depreciable, Property and equipment	4,808.062	5,154.982	5,598.707
Depreciable Property and equipment, net	2,421.987	2,558.121	2,756.532
Goodwill	391.887	391.887	391.887
Other long-term assets	191.921	198.218	190.313
Total assets	8,059.734	8,562.932	9,224.473
Liabilities and Stockholder's Equity			
Current Liabilities			
Accounts payable	3,864.168	4,095.854	4,168.940
Accrued expenses and other	531.561	551.625	563.350
Income taxes payable	58.082	42.841	34.011
Total current liabilities	4,453.811	4,690.320	4,766.301
Long-term debt	4,624.876	4,924.119	5,081.238
Net, Deferred tax liability	212.816	247.645	335.803
Other long-term liabilities	465.990	488.386	469.508
Total Liabilities	9,757.493	10,350.470	10,652.850
Stockholder's Deficit			
Preferred stock	-	-	-
Common stock	938.676	1,054.950	1,086.958
Retained deficit / earnings	(1,418.738)	(1,602.186)	(1,642.387)
Accumulated other comprehensive loss	(249.518)	(307.529)	(254.557)
Treasury stock, at cost	(971.810)	(932.773)	(618.391)
Total stockholders' deficit	(1,701.390)	(1,787.538)	(1,428.377)
Total liabilities and stockholders' deficit	8,056.103	8,562.932	9,224.473

AutoZone

Cash Flow Statement

Fiscal Years Ending Aug. 30	**2015**	**2016**	**2017**
Cash Flow From Operating Activites			
Net income	1,160.241	1,241.007	1,280.869
Adjustments to reconcile net income to net cash provided by operating activities			
Depreciation and amortization of property and equipment and intangibles	269.92	297.40	323.05
Amortization of debt origination fees	6.23	7.98	8.37
Income tax benefit from exercise of stock options	--	--	--
Deferred income taxes	35.97	45.02	74.90
Share-based compensation expense	41.00	39.83	38.24
Pension plan contributions	-	(52.72)	(17.76)
Changes in operating assets and liabilities			
Accounts receivable	(36.47)	(41.45)	7.80
Merchandise inventories	(266.78)	(227.52)	(236.81)
Accounts payable and accrued expenses	291.52	271.20	82.61
Income taxes payable	74.49	50.12	(3.66)
Other, net	(3.10)	10.20	13.00
Net cash provided by operating activities	1,573.02	1,641.06	1,570.61
Cash Flows From Investing Activities			
Capital expenditures	(480.58)	(488.79)	(553.83)
Acquisition of business, net of cash	(75.74)	-	-
Purchase of intangibles	(10.00)	(10.00)	-
Purchase of marketable securities	(49.74)	(130.17)	(85.71)
Proceeds from sale of marketable securities	46.41	120.47	82.99
Disposal of capital assets and other, net	1.74	2.65	2.95
Net cash used in investing activities	(567.91)	(505.84)	(553.60)
Cash Flows From Financing Activities			
Net payments / proceeds from commercial paper	153.80	149.90	(42.40)
Net payments of / proceeds from short-term borrowings	--	--	--
Proceeds from issuance of debt	650.00	650.00	600.00
Repayment of debt	(500.00)	(500.00)	(400.00)
Net proceeds from sale of common stock	66.72	80.29	54.69
Purchase of treasury stock	(1,271.42)	(1,452.46)	(1,071.65)
Income tax benefit from exercise of stock options	--	--	--
Payments of capital lease obligations	(34.99)	(36.32)	(47.60)
Other, net	(8.71)	(7.94)	(7.36)
Net cash used in financing activities	(944.60)	(1,116.53)	(914.33)
Effect of exchange rate changes on cash	(9.69)	(4.27)	0.85
Net increase / decrease in cash and cash equivalents	50.82	14.43	103.54
Cash and cash equivalents at beginning of period	124.49	175.31	189.73
Cash and cash equivalents at end of period	175.31	189.73	293.27
Supplemental disclosure			
Interest paid, net of interest cost capitalized	(137.63)	(136.73)	(135.33)
Income taxes paid	(539.15)	(582.38)	(579.93)
Assets acquired through capital lease	(71.05)	(94.05)	(84.01)

AutoZone

Cash Flow Statement

Fiscal Years Ending Aug. 30	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Cash Flow From Operating Activites					
Net income	1,299.260	1,330.864	1,355.031	1,380.705	1,398.813
amortization and depreciation expense	337.943	362.444	388.721	416.903	447.129
Merchandise inventories	86.450	(112.621)	(78.452)	(80.027)	(65.658)
Accounts receivable	(9.522)	(8.612)	(5.999)	(6.120)	(5.021)
Accounts payable	44.216	125.009	87.082	88.830	72.880
Accrued expenses and other	16.043	17.191	11.975	12.216	10.023
Income taxes payable	2.381	2.547	2.726	2.917	3.121
Net, Deferred tax liability	(288.371)	0.581	(1.332)	(1.748)	(1.923)
Net cash provided by operating activities	*1,488.400*	*1,717.403*	*1,759.751*	*1,813.676*	*1,859.363*
Cash Flows From Investing Activities					
Capital Expenditures	(529.236)	(518.170)	(514.839)	(548.303)	(583.943)
Other current assets	10.039	(4.306)	(3.000)	(3.060)	(2.510)
Other long-term assets	6.855	6.203	6.203	3.474	2.030
other long term liabilites	41.137	15.151	10.555	10.766	8.833
Net cash used in investing activities	*(471.205)*	*(501.122)*	*(501.081)*	*(537.123)*	*(575.590)*
Cash Flows From Financing Activities					
Long-term debt	110.511	399.765	391.406	388.890	414.168
Common stock	124.779	124.779	124.779	124.779	124.779
Treasury stock	(1,200.000)	(1,200.000)	(1,200.000)	(1,200.000)	(1,200.000)
Net cash used in financing activities	*(964.710)*	*(675.456)*	*(683.815)*	*(686.331)*	*(661.053)*
Net increase (decrease) in cash and cash equivalents	52.485	540.825	574.855	590.222	622.720
Cash and Cash Equivalents, beginning of the year	293.270	345.755	886.580	1,461.435	2,051.657
Cash and Cash Equivalents, end of the year	345.755	886.580	1,461.435	2,051.657	2,674.377
Supplemental disclosure					
Interest paid, net of interest cost capitalized					
Income taxes paid					
Assets acquired through capital lease					

AutoZone

Common Size Balance Sheet

Fiscal Years Ending Aug. 30	2015	2016	2017
% of Sales			
Revenues	100%	100%	100%
Cost of Sales	45.06%	44.47%	44.32%
Depreciation and amortization	2.65%	2.80%	2.97%
Gross profit	52.29%	52.74%	52.71%
Operating, selling, general and administrative expenses	33.12%	33.36%	33.61%
Operating profit	19.17%	19.37%	19.10%
Interest expense, net	1.48%	1.39%	1.42%
Income before income taxes	17.69%	17.98%	17.68%
Income taxes	6.31%	6.32%	5.92%
Net income	11.39%	11.67%	11.76%

AutoZone

Common size Balance Sheet

%Sales

Fiscal Years Ending Aug. 30	**2015**	**2016**	**2017**
Assets			
Current Assets			
Cash	2%	2%	2.69%
Normal cash	0%	0%	0.03%
Excess cash	2%	2%	2.66%
Accounts receivable	2%	3%	2.58%
Merchandise inventories	34%	34%	35.65%
Other current assets	1%	1%	1.43%
total current assets (ours)	39%	40%	42.35%
Total Current Assets	39%	40%	42.35%
Property and Equiment:	0%	0%	0.00%
Gross, Property and equipment	58%	60%	63.12%
Accumulated depreciation and amortization	-23%	-24%	-26.10%
Depreciable, Property and equipment	47%	48%	51.42%
Depreciable Property and equipment, net	24%	24%	25.32%
Goodwill	4%	4%	3.60%
Other long-term assets	2%	2%	1.75%
Total assets	79%	81%	84.72%
Liabilities and Stockholder's Equity			
Current Liabilities	0%	0%	0.00%
Accounts payable	38%	39%	38.29%
Accrued expenses and other	5%	5%	5.17%
Income taxes payable	1%	0%	0.31%
Total current liabilities	44%	44%	43.77%
Long-term debt	45%	46%	46.67%
Net, Deferred tax liability	2%	2%	3.08%
Other long-term liabilities	5%	5%	4.31%
Total Liabilities	96%	97%	97.83%
Stockholder's Deficit			
Preferred stock	0%	0%	0.00%
Common stock	9%	10%	9.98%
Retained deficit / earnings	-14%	-15%	-15.08%
Accumulated other comprehensive loss	-2%	-3%	-2.34%
Treasury stock, at cost	-10%	-9%	-5.68%
Total stockholders' deficit	-17%	-17%	-13.12%
Total liabilities and stockholders' deficit	79%	81%	84.72%

AutoZone

Weighted Average Cost of Capital (WACC) Estimation

Cost of Equity	7.67%
% of Equity in Capital Structure	*71.72%*
Risk Free	3.073%
Risk Premium	4.60%
Beta	1

Cost of Debt	3.172%
% of Debt in Capital Structure	20.74%

Market Value of Company	$17,444.55
Value of Debt	$5,043.50
Value of Leases	$1,833.59
Value of Company	$24,321.64
WACC	6.16%

AutoZone

Discounted Cash Flow (DCF) and Economic Profit (EP) Valuation Models

Key Inputs:	
CV Growth	2%
CV ROIC	0.28
WACC	6.58%
Cost of Equity	8.00%

Fiscal Years Ending Aug. 30	2018E	2019E	2020E	2021E	2022(CV)
DCF Model					
Free Cash Flow	1,635.75	1,406.88	1,452.32	1,457.77	
Continuing Value					32,641.03
PV of FCF	1,534.72	1,238.45	1,199.49	1,129.62	25,293.49
Value of Operating Assets	30,395.77				
Excess Cash	289.76				
Marketable Securities	100.90				
Debt	(5,081.24)				
PV of operating leases	(1,833.59)				
ESOP	(5,283.71)				
Value of Equity	18,587.89				
Shares Outstanding	28.43				
Intrinsic Value (per share)	**$ 653.813**				

Fiscal Years Ending Aug. 30	2018E	2019E	2020E	2021E	2022(CV)
EP Model					
Economic Profit to Discount	1,273.71	1,313.94	1,318.67	1,324.51	
Continuing Value					26,589.12
PV of FCF Discounted by WACC	1,195.03	1,156.64	1,089.10	1,026.36	20,603.88
PV [Economic Profit]	25,071.02				
Beginning invested capital	5,324.75				
Value of Operating Assets	30,395.77				
Excess Cash	289.76				
Marketable Securities	100.90				
Debt	(5,081.24)				
PV of operating leases	(1,833.59)				
ESOP	(5,283.71)				
Value of Equity	18,587.89				
Shares Outstanding	28.43				
Intrinsic Value (per share)	**$ 653.813**				

AutoZone

Value Driver Estimation

Fiscal Years Ending Aug. 30	2015	2016	2017	2018E	2019E	2020E	2021E	2022E
NOPLAT								
Revenue	10,187.34	10,635.68	10,888.68	11,163.64	11,494.87	11,725.61	11,960.99	12,154.10
Cost of sales, including warehouse and delivery expenses	(4,590.39)	(4,729.54)	(4,826.01)	(4,947.87)	(5,094.68)	(5,196.95)	(5,301.27)	(5,386.86)
Operating, selling, general and administrative expenses	(3,373.98)	(3,548.34)	(3,659.55)	(3,907.27)	(4,023.21)	(4,103.96)	(4,186.35)	(4,253.93)
Depreciation and amortization	(269.92)	(297.40)	(323.05)	(337.94)	(362.44)	(388.72)	(416.90)	(447.13)
Interest on operating lease	65.16	67.01	69.68	67.51	72.24	76.93	81.93	87.26
EBITA	2,018.21	2,127.40	2,149.75	2,038.06	2,086.78	2,112.91	2,138.40	2,153.44
Total adjusted taxes	693.30	720.39	690.73	413.82	423.05	427.56	431.86	433.90
Change in deferred tax assets	34.77	34.83	88.16	-	-	-	-	-
NOPLAT	1,359.68	1,441.84	1,547.18	1,624.24	1,663.73	1,685.36	1,706.54	1,719.54
IC								
Working Capital								
Cash and cash equivalents	2.10	2.27	3.51	4.14	10.62	17.51	24.58	32.04
Accounts receivable	247.87	287.68	280.73	290.25	298.87	304.87	310.99	316.01
Merchandise inventories	3,421.635	3,631.916	3,882.086	3,795.636	3,908.257	3,986.709	4,066.735	4,132.394
Accounts payable	(3,864.168)	(4,095.854)	(4,168.940)	(4,213.156)	(4,338.165)	(4,425.247)	(4,514.076)	(4,586.957)
Accrued expenses and other	(531.561)	(551.625)	(563.350)	(579.393)	(596.584)	(608.559)	(620.775)	(630.798)
Income taxes payable	(58.082)	(42.841)	(34.011)	(36.392)	(38.939)	(41.665)	(44.581)	(47.702)
Property and equipment, net	3,505.632	3,733.254	4,031.018	4,222.311	4,378.037	4,504.155	4,635.556	4,772.370
PV of operating leases	1,714.708	1,763.338	1,833.589	1,776.583	1,900.944	2,024.505	2,156.098	2,296.244
Net intangible assets (non goodwill)	191.921	198.218	190.313	183.458	177.255	171.052	167.578	165.548
Net, Other Operating Liabilities	(113.700)	(121.700)	(130.200)	(130.200)	(130.200)	(130.200)	(130.200)	(130.200)
Invested Capital	**4,516.358**	**4,804.660**	**5,324.752**	**5,313.245**	**5,570.095**	**5,803.127**	**6,051.903**	**6,318.951**
ROIC	**#REF!**	**0.319**	**0.322**	**0.305**	**0.313**	**0.303**	**0.294**	**0.284**
Econmic Profit	**#REF!**	**1,144.518**	**1,230.877**	**1,273.705**	**1,313.944**	**1,318.666**	**1,324.512**	**1,321.129**
FCF	**#REF!**	**1,153.537**	**1,027.085**	**1,635.751**	**1,406.876**	**1,452.324**	**1,457.768**	**1,452.490**

AutoZone

Dividend Discount Model (DDM) or Fundamental P/E Valuation Model

Fiscal Years Ending	2018E	2019E	2020E	2021E	2022E
EPS	$ 40.25	$ 35.93	$ 32.43	$ 29.69	$ 27.32
Key Assumptions					
CV growth	1.61%				
CV ROE	-79.66%				
Cost of Equity	8.00%				
Future Cash Flows					
P/E Multiple (CV Year)					$ 17.27
EPS (CV Year)					$ 27.32
Future Stock Price					471.76311
Discounted Cash Flows					$ 346.824
Current forward P/E Multiple	9.65272529				
Current share price	$634.52				
Intrinsic Value	$ 364.05				

AutoZone

Key Management Ratios

Fiscal Years Ending	2015.00	2016.00	2017.00	2018E	2019E	2020E	2021E	2022E
Liquidity Ratios								
current ratio = CA/CL	0.89	0.90	0.97	0.95	1.05	1.16	1.27	1.38
quick ratio = [CA-INV]/CL	0.12	0.13	0.15	0.16	0.27	0.38	0.49	0.60
cash ratio = Cash/CL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
net working capital = CA-CL	-483.52	-450.75	-155.05	-252.17	269.45	829.97	1405.44	2015.32
fixed charge coverage = [EBIT+LEASE PAYMENTS]/[INTEREST PAYMENTS+LEASE	1.67	1.70	1.69					
interest coverage = EBIT/IE	12.98	13.95	13.46	13.70	13.84	14.38	15.09	15.84
Activity or Asset-Management Ratios								
Asset Turnover Ratio =SALES/ATA		1.28	1.22	1.20	1.18	1.11	1.05	1.00
Accounts Payable Turnover = SALES/AVE.AP		2.67	2.63	2.66	2.69	2.68	2.68	2.67
Days Payable oustanding = 365 / A.P. Turnover		136.59	138.52	137.03	135.77	136.40	136.40	136.66
days receivables = 365/[Sales/average accounts receivable]		9.19	9.53	9.33	9.35	9.40	9.40	9.41
Days inventories turnover = 365/[COGS/average inventory]		121.03	125.94	125.51	122.31	122.88	122.88	123.11
Cash Conversion Cycle = [365/[COGS/average inventory]] + [365/[Sales/average accounts receivable]] - [365[Purchases/average trade payables]]	0.00	-6.36	-3.06	-2.18	-4.10	-4.12	-4.12	-4.13
Financial Leverage Ratios								
debt-to-equity = D/E	-2.72	-2.75	-3.56	-4.31	-5.89	-8.94	-17.53	-170.46
debt-to-assets = D/A	0.57	0.58	0.55	0.55	0.55	0.55	0.54	0.54
leverage ratio = A/E	-4.74	-4.79	-6.46	-7.78	-10.74	-16.40	-32.42	-316.78
Profitability Ratios								
Net profit margin = NI / Revenue	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Gross profit margin = (Revenue - COGS) / Revenue	0.55	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Operating profit margin = EBIT/SALES	0.19	0.19	0.19	0.18	0.18	0.17	0.17	0.17
ROA = NI/A		0.14	0.14	0.14	0.13	0.13	0.12	0.11
Operating ROA = EBIT/ATA		0.25	0.23	0.21	0.21	0.19	0.18	0.17
ROE = NI/E		-0.71	-0.80	-0.99	-1.24	-1.68	-2.68	-6.94
Interest Burden = Pretax income / operating income	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.94
Tax Burden = NI/EBT	0.64	0.65	0.67	0.71	0.71	0.72	0.72	0.72
Payout Policy Ratios								
Earnings Per Share	4.44	0.29	0.44	1.29	1.08	0.44	1.34	-3.54

AutoZone

Relative Valuation Models

Ticker	Company	Price	EPS 2018E	EPS 2019E	P/E 18	P/E 19	Est. 5yr EPS gr.	PEG 18	PEG 19	BV Equity	Tangible BV Equity	P/B	Tangible P/B
AAP	Advance Auto Parts	111.98	6.69	7.59	16.70	14.72	21.74	0.77	0.68	3,415.20	24.66	46.19	4.54
ORLY	O'Reilly Automotive	235.63	15.40	17.10	15.66	14.10	165.42	0.09	0.09	653.05	(1.72)	7.75	(136.61)
GPC	Genuine Parts	86.50	5.69	6.02	15.45	14.61	0.48	32.22	30.47	3,464.16	(0.97)	23.27	(89.19)
	Average	**144.70**	**9.26**	**10.24**	**15.94**	**14.48**	**62.55**	**11.03**	**10.41**	**2,510.80**	**7.32**	**25.74**	**(73.75)**
AZO	AutoZone	$605.00	40.25	35.93	15.0	16.8	(0.0952)	(157.9)	(176.9)	-1428.38	(51.96)	(0.42)	(11.64)

Implied Relative Value:

P/E (EPS18)	**$ 641.57**
P/E (EPS19)	**$ 520.20**
PEG (EPS18)	**$ (42.26)**
PEG (EPS19)	**$ (35.61)**
P/B	**$ (36,761.66)**
P/Tangible BV	**$ 3,831.92**

Present Value of Operating Lease Obligations (2017)

Fiscal Years Ending Aug. 30	Operating Leases
2018	293.826
2019	284.523
2020	262.782
2021	237.241
2022	231.399
Thereafter	861.409
Total Minimum Payments	2171.18
Less: Interest	338
PV of Minimum Payments	1834

Capitalization of Operating Leases

Pre-Tax Cost of Debt	3.80%
Number Years Implied by Year 6 Payment	3.7

Year	Lease Commitment	PV Lease Payment
1	293.826	283.1
2	284.523	264.1
3	262.782	235.0
4	237.241	204.4
5	231.399	192.0
6 & beyond	231.399	655.1
PV of Minimum Payments		1833.6

Present Value of Operating Lease Obligations (2016)

Fiscal Years Ending Aug. 30	Operating Leases
2017	274.341
2018	266.301
2019	248.263
2020	225.276
2021	201.207
Thereafter	890.869
Total Minimum Payments	2106.257
Less: Interest	343
PV of Minimum Payments	1763

Capitalization of Operating Leases

Pre-Tax Cost of Debt	3.80%
Number Years Implied by Year 6 Payment	4.4

Year	Lease Commitment	PV Lease Payment
1	274.341	264.3
2	266.301	247.2
3	248.263	222.0
4	225.276	194.1
5	201.207	167.0
6 & beyond	201.207	668.9
PV of Minimum Payments		1763.3

Present Value of Operating Lease Obligations (2015)

Fiscal Years Ending	Operating Leases
2016	259.175
2017	250.787
2018	234.64
2019	215.692
2020	192.822
Thereafter	905.629
Total Minimum Payments	2058.745
Less: Interest	344
PV of Minimum Payments	1715

Capitalization of Operating Leases

Pre-Tax Cost of Debt	3.80%
Number Years Implied by Year 6 Payment	4.7

Year	Lease Commitment	PV Lease Payment
1	259.175	249.7
2	250.787	232.8
3	234.64	209.8
4	215.692	185.8
5	192.822	160.0
6 & beyond	192.822	676.6
PV of Minimum Payments		1714.7

Present Value of Operating Lease Obligations (2014)

Fiscal Years Ending	Operating Leases
2015	244.535
2016	236.869
2017	221.171
2018	204.744
2019	185.442
Thereafter	942.498
Total Minimum Payments	2035.259
Less: Interest	353
PV of Minimum Payments	1683

Capitalization of Operating Leases

Pre-Tax Cost of Debt	3.80%
Number Years Implied by Year 6 Payment	5.1

Year	Lease Commitment	PV Lease Payment
1	244.535	235.6
2	236.869	219.8
3	221.171	197.8
4	204.744	176.4
5	185.442	153.9
6 & beyond	185.442	699.3
PV of Minimum Payments		1682.7

Present Value of Operating Lease Obligations (2013)

Fiscal Years Ending 476.075720315221	Operating Leases
2014	228.747
2015	220.877
2016	204.122
2017	187.312
2018	170.745
Thereafter	945.429
Total Minimum Payments	1957.232
Less: Interest	351
PV of Minimum Payments	1607

Capitalization of Operating Leases

Pre-Tax Cost of Debt	3.80%
Number Years Implied by Year 6 Payment	5.5

Year	Lease Commitment	PV Lease Payment
1	228.747	220.4
2	220.877	205.0
3	204.122	182.5
4	187.312	161.4
5	170.745	141.7
6 & beyond	170.745	695.7
PV of Minimum Payments		1606.7

Present Value of Operating Lease Obligations (2012)

Fiscal Years Ending 1323.06614384431	Operating Leases
2013	217.844
2014	209.3
2015	192.296
2016	174.844
2017	157.691
Thereafter	958.435
Total Minimum Payments	1910.41
Less: Interest	354
PV of Minimum Payments	1556

Capitalization of Operating Leases

Pre-Tax Cost of Debt	3.80%
Number Years Implied by Year 6 Payment	6.1

Year	Lease Commitment	PV Lease Payment
1	217.844	209.9
2	209.3	194.3
3	192.296	171.9
4	174.844	150.6
5	157.691	130.9
6 & beyond	157.691	698.5
PV of Minimum Payments		1556.0

Present Value of Operating Lease Obligations (2011)

Fiscal Years Ending	Operating Leases
2012	209.778
2013	200.715
2014	182.071
2015	164.283
2016	145.7
Thereafter	948.906
Total Minimum Payments	1851.453
Less: Interest	352
PV of Minimum Payments	1500

Capitalization of Operating Leases

Pre-Tax Cost of Debt	3.80%
Number Years Implied by Year 6	6.5

Year	Lease Commitment	PV Lease Payment
1	209.778	202.1
2	200.715	186.3
3	182.071	162.8
4	164.283	141.5
5	145.7	120.9
6 & beyond	145.7	686.2
PV of Minimum Payments		1499.8

Present Value of Operating Lease Obligations (2010)

Fiscal Years Ending	Operating Leases
2011	196.291
2012	187.085
2013	170.858
2014	151.287
2015	133.549
Thereafter	900.977
Total Minimum Payments	1740.047
Less: Interest	335
PV of Minimum Payments	1405

Capitalization of Operating Leases

Pre-Tax Cost of Debt	3.80%
Number Years Implied by Year 6	6.7

Year	Lease Commitment	PV Lease Payment
1	196.291	189.1
2	187.085	173.6
3	170.858	152.8
4	151.287	130.3
5	133.549	110.8
6 & beyond	133.549	648.8
PV of Minimum Payments		1405.5

Present Value of Operating Lease Obligations (2009)

Fiscal Years Ending	Operating Leases
2010	177.781
2011	167.76
2012	151.89
2013	135.348
2014	115.801
Thereafter	809.447
Total Minimum Payments	1558.027
Less: Interest	302
PV of Minimum Payments	1256

Capitalization of Operating Leases

Pre-Tax Cost of Debt	3.80%
Number Years Implied by Year 6	7.0

Year	Lease Commitment	PV Lease Payment
1	177.781	171.3
2	167.76	155.7
3	151.89	135.8
4	135.348	116.6
5	115.801	96.1
6 & beyond	115.801	580.4
PV of Minimum Payments		1255.8

Present Value of Operating Lease Obligations (2008)

Fiscal Years Ending	Operating Leases
2009	161.435
2010	149.999
2011	133.837
2012	117.61
2013	102.035
Thereafter	707.535
Total Minimum Payments	1372.451
Less: Interest	264
PV of Minimum Payments	1108

Capitalization of Operating Leases

Pre-Tax Cost of Debt	3.80%
Number Years Implied by Year 6	6.9

Year	Lease Commitment	PV Lease Payment
1	161.435	155.5
2	149.999	139.2
3	133.837	119.7
4	117.61	101.3
5	102.035	84.7
6 & beyond	102.035	507.8
PV of Minimum Payments		1108.2

VALUATION OF OPTIONS GRANTED IN ESOP

Ticker Symbol	AZO
Current Stock Price	$600.00
Risk Free Rate	3.07%
Current Dividend Yield	0.00%
Annualized St. Dev. of Stock Returns	38.80%

Range of Outstanding Options	Number of Shares	Average Exercise Price	Average Remaining Life (yrs)	B-S Option Price	Value of Options Granted
Range 1	3	132.32	0.35	$ 469.10	$ 1,234
Range 2	2	173.01	1.40	$ 434.38	$ 983
Range 3	2	228.95	2.56	$ 392.48	$ 705
Range 4	2	269.32	3.28	$ 368.64	$ 678
Range 5	2	327.90	4.32	$ 344.04	$ 609
Range 6	2	428.72	5.39	$ 308.82	$ 543
Range 7	2	493.18	6.17	$ 295.96	$ 532
Total	14	$ 279.13	3.10	$ 309.07	**$ 5,284**

Effects of ESOP Exercise and Share Repurchases on Common Stock Balance Sheet Account and Number of Shares Outstanding

Number of Options Outstanding (shares):	13.85
Average Time to Maturity (years):	3.10
Expected Annual Number of Options Exercised:	4.47
Current Average Strike Price:	$ 279.13
Cost of Equity:	8.00%
Current Stock Price:	$634.52

	2018E	2019E	2020E	2021E	2022E	
Increase in Shares Outstanding:	4.47	4.47	4.47	4.47	4.47	
Average Strike Price:	$ 279.13	$ 279.13	$ 279.13	$ 279.13	$ 279.13	
Increase in Common Stock Account:	**1,248**	**1,248**	**1,248**	**1,248**	**1,248**	**(Assumes common stock and additional paid in capital are combined into one account).**
Change in Treasury Stock	-200	-200	-200	-200	-200	
Expected Price of Repurchased Shares:	$ 634.52	$ 685.25	$ 740.04	$ 799.20	$ 863.10	
Number of Shares Repurchased:	**-0.32**	**-0.29**	**-0.27**	**-0.25**	**-0.23**	-
Shares Outstanding (beginning of the year)	27.49	32.28	37.04	41.78	46.50	
Plus: Shares Issued Through ESOP	4.47	4.47	4.47	4.47	4.47	
Less: Shares Repurchased in Treasury	-0.32	-0.29	-0.27	-0.25	-0.23	
Shares Outstanding (end of the year)	**32.28**	**37.04**	**41.78**	**46.50**	**51.20**	

Factset(1)

Fred https://fred.stlouisfed.org(2)

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