# Automotive Industry Operating Benchmarks

**Operational and market capitalization data for 150 automotive companies**

1-Jan-2022

worldlocity

# Version

| VERSION | NOTES |
|---|---|
| 2021-1.1 | Initial version, dated 04.01.21 |
| 2021-2.1 | Updated financial and market cap data for 06.25.21. Removed companies that merged or were taken private. |
| 2021-3.1 | Updated financial and market cap data for 11.30.21. Removed companies that merged or were taken private. |
| 2022-1.1 | Updated financial and market cap data for 01.01.22. Added companies and removed those that merged or were taken private. |

**Versioning convention:** This document is versioned as follows: **YYYY.N.n**, where **YYYY** is the year, **N** is the major release number, and **n** is the minor release number. A major release includes one or more of the following: the number of companies changes; reports and analyses change; financial and market cap information are updated, and a new date is attached to the report. A minor fixes errors, including data errors, formatting errors, and inconsistencies.

# Contents

# 2022 Automotive Industry Report: Key Takeaways

- The Automotive industry 3-year CAGR is 0.8% (overall dollars growth). The average company 3-year CAGR is -0.6% .
- The average Automotive company has gross margins of 21.7% , invests 10.1% of revenue in selling, general, and administrative expense, 4.7% in research and development, and generates 6.7% operating margin, 3.6% EBITDA margin, 3.1% free cash flow, and 6.1% return on invested capital.
- The Automotive company average inventory turns is 6.9 . The median is 5.7 . The difference between the average and the median indicates a few outliers raise the average. The median is more in line with the industry operational structure.
- The average Automotive company has 31.6% PP&E, and 15.0% in goodwill and intangibles, all as a percentage of revenue. Goodwill and intangibles are a proxy for mergers and acquisitions; based on this measure, Automotive is among the lowest industries in mergers and acquisitions. While many industries exhibit characteristics of the "intangibles economy," Automotive is still among those that are asset, labor, and material intensive.
- As expected, Automotive companies that lead in operating profit, net profit, cash flow, and return on investment (ROA, ROIC, economic profit) are also leaders in market cap multiple.
- Automotive companies with higher inventory turns tend to have significantly lower market cap multiples than companies with lower inventory turns. This is an indication that inventory turns is a poor indicator of company market performance. (Note: controlling for gross margin yields the same conclusion).
- Automotive companies with higher IP content in their products invest more in R&D, have higher gross margins, and significantly higher market cap multiples. There is a symbiotic relationship between gross margin and R&D investment: higher R&D investment leads to more differentiated products and higher gross margins; on the other hand, differentiated products create higher gross margins, which allows for higher R&D investment. Companies in a low gross margin trap may have challenges breaking out of it without multi-year increases in R&D investment (or M&A).
- Historical analysis (using aggregate data and ratios) indicates the operational structure is essentially the same as it was a decade ago. This includes similar gross margins, operating margins, asset intensity, inventory turns, and cash flows. This indicates the industry has a certain physical setpoint and that there are individual winners and losers around that setpoint, but that the overall industry is not operationally performing better than it was a decade ago.
- Individual operational measures are poor statistical predictors of market cap multiple. Quartile analysis was performed to contrast the operational characteristics of market cap multiple leaders with others.
- Market cap multiple leaders have cap multiples that are 2.8X average and 18.4X laggards. Leaders have significantly higher gross margins, invest significantly more in R&D, and generate significantly higher operating margins, cash flow, and return on investment (ROA, ROIC, and economic profit).
- From a supply chain management perspective, data in this report supports the thesis that market leaders run their supply chains with more of a profit center mentality than a cost center mentality, which has historically been the case. This further suggests supply chain management has evolved to a sophisticated multivariate decision science, rather than a unidimensional cost management function.

# Data Set

Information on the companies and the data set used in the analysis.

# Data Set

## COMPANIES

The data set includes 150 publicly-traded Automotive companies.

**150**

## REVENUE

Aggregate revenue for companies in the data set is $3.2 trillion for the latest reporting fiscal year as of the date on the cover of this report.

**$3.2T**

## MARKET CAPITALIZATION

Aggregate market cap for companies in the data set is $3.1 trillion as of date on the cover of this report.

**$3.1T**

Notes:
1. Unless otherwise noted, all company financial data are based on trailing twelve months results as of the date on the cover of this report.
2. All market capitalizations are as of the date on the cover of this report.
3. M=million; B=billion; T=trillion.

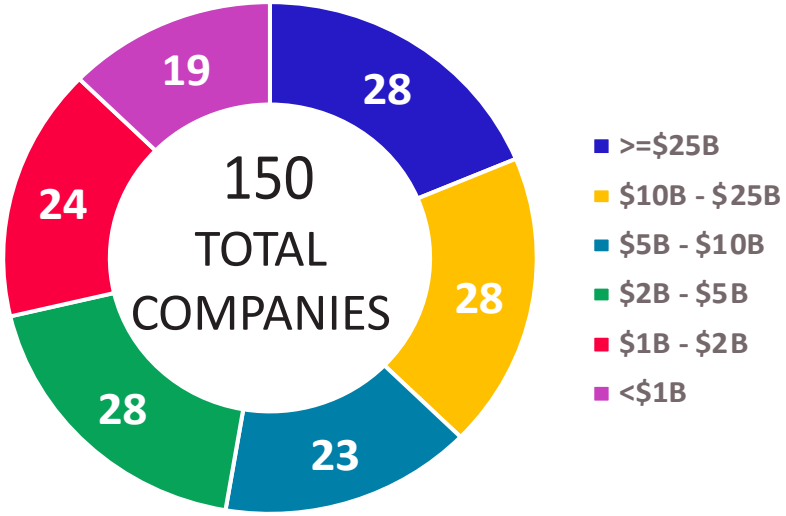
# Data Set

## *Companies included in this report*

Adient PLC
Aisin Corp
Akebono Brake Industry
Allison Transmission Ho
AMA Group Ltd
American Axle & Mfg Hol
Aptiv PLC
ARB Corp Ltd
Aston Martin Lagonda Gl
Autoliv Inc
BAIC Motor Corp Ltd
Bayerische Motoren Werk
BeijingWest Industries
Blue Bird Corp
BorgWarner Inc
Brembo SpA
Bridgestone Corp
BRP Inc
BYD Co Ltd
Chaowei Power Holdings
China Automotive System
China XD Plastics Co Lt
China Zenix Auto Intern
Cie Generale des Etabli
Commercial Vehicle Grou
Continental AG
Controladora Nemak SAB
Cooper-Standard Holding
Daimler AG
Dana Inc
Denso Corp
Dongfeng Motor Group Co
Dorman Products Inc
Douglas Dynamics Inc
ElringKlinger AG
EXOR NV
Faurecia SE
Ferrari NV
Ford Motor Co
Ford Otomotiv Sanayi AS
Fox Factory Holding Cor
Fuyao Glass Industry Gr
Garrett Motion Inc
Geely Automobile Holdin
General Motors Co
Gentex Corp
Gentherm Inc
Gestamp Automocion
Goodyear Tire & Rubber
Great Wall Motor Co Ltd
Guangzhou Automobile Gr
Harley-Davidson Inc
HELLA GmbH & Co KGaA
Hino Motors Ltd
Honda Motor Co Ltd
Horizon Global Corp
Hyundai Motor Co
Iochpe-Maxion SA
Isuzu Motors Ltd
Jardine Cycle & Carriag
Johnson Electric Holdin
JTEKT Corp
Karsan Otomotiv Sanayii
Kia Corp
Knorr-Bremse AG
Koito Manufacturing Co
Kongsberg Automotive Ho
LCI Industries Inc
Lear Corp
Li Auto Inc
Linamar Corp
LKQ Corp
Mabuchi Motor Co Ltd
Magna International Inc
Mahindra & Mahindra Ltd
Malibu Boats Inc
Marine Products Corp
Martinrea International
MasterCraft Boat Holdin
Mazda Motor Corp
Meritor Inc
Miller Industries Inc.
Minth Group Ltd
Mitsubishi Motors Corp
Modine Manufacturing Co
Monro Inc
Motorcar Parts of Ameri
Motus Holdings Ltd
Nemak SAB de CV
Nexteer Automotive Grou
NFI Group Inc
NGK Spark Plug Co Ltd
NHK Spring Co Ltd
Nifco Inc
NIO Inc
Nippon Sheet Glass Co L
Nissan Motor Co Ltd
Nissan Shatai Co Ltd
Niu Technologies
Nokian Tyres PLC
NSK Ltd
OneWater Marine Inc
Oshkosh Corp
PACCAR Inc
Patrick Industries Inc
Piaggio & C. SpA
Pirelli & C SpA
Polaris Inc
PT Astra International
Renault SA
Riken Corp
SAF Holland SA
Sanden Corp
Schaeffler AG
Sime Darby Bhd
Standard Motor Products
Stanley Electric Co Ltd
Stellantis NV
Stoneridge Inc
Strattec Security Corp
Subaru Corp
Sumitomo Electric Indus
Sumitomo Rubber Industr
Superior Industries Int
Suzuki Motor Corp
Tachi-S Co Ltd
Tata Motors Ltd
Tenneco Inc
Tesla Inc
Thor Industries Inc
Tianneng Power Internat
Tokai Rika Co Ltd
Toyo Tire Corp
Toyoda Gosei Co Ltd
Toyota Boshoku Corp
Toyota Industries Corp
Toyota Motor Corp
Traton SE
Uni-Select Inc
Valeo SA
Veoneer Inc
Visteon Corp
Volkswagen AG
Volvo Car AB
Winnebago Industries In
Wuling Motors Holdings
Xingda International Ho
Yadea Group Holdings Lt
Yamaha Motor Co Ltd
Yokohama Rubber Co Ltd

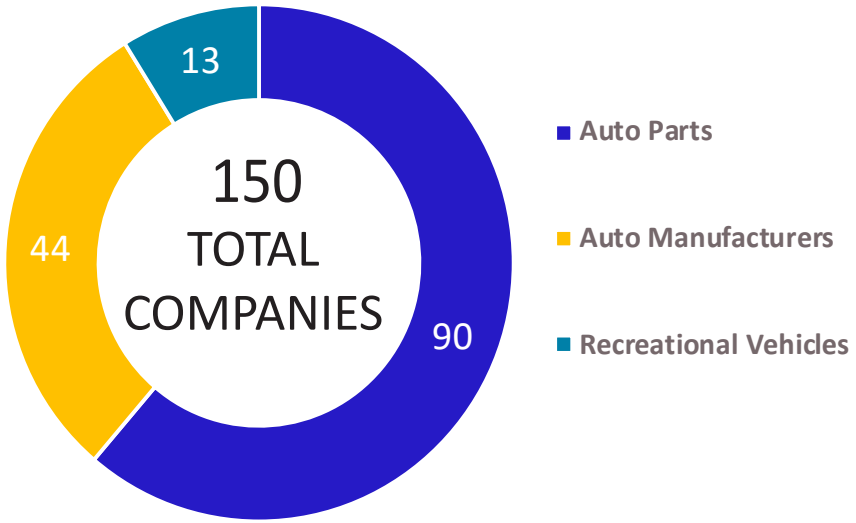
# Data Set
## *Company distribution*

### BY ANNUAL REVENUE

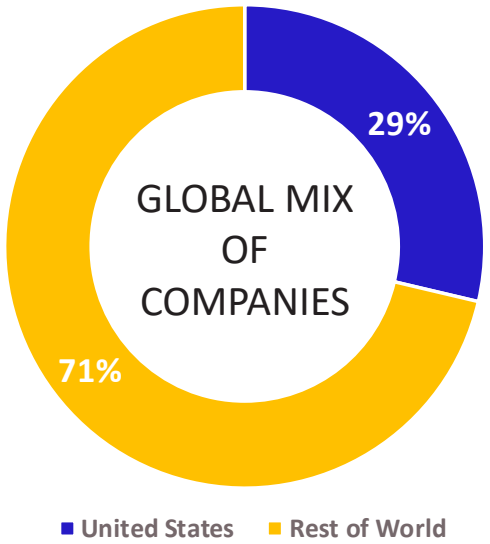



MEDIAN REVENUE = **$5,331M**

### BY SUB-INDUSTRY




### GEOGRAPHIC REGION

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# Data Set

## *Index of key variables included in this report*

*This report provides analysis of the following variables (and derivatives) for trailing twelve months (TTM) results and for the historical period from 2010-2020.*

REVENUE

GROWTH RATE

GROSS MARGIN

SELLING, GENERAL, AND ADMIN

RESEARCH & DEVELOPMENT

REVENUE PER EMPLOYEE

OPERATING PROFIT

NET PROFIT

FREE CASH FLOW

STOCK COMPENSATION

CASH

DEBT

NET CASH

EBITDA

EQUITY

CAPITAL EXPENDITURES (CAPEX)

PROPERTY, PLANT, AND EQUIPMENT (PP&E, NET)

GOODWILL

DEFERRED REVENUE

REMAINING PERFORMANCE OBLIGATIONS (RPOS)

INVENTORY

DAYS IN PAYABLES

DAYS IN RECEIVABLES

CASH-TO-CASH CYCLE

CAPITALIZATION TO REVENUE

CAPITALIZATION TO EBITDA

RETURN ON INVESTED CAPITAL

RETURN ON ASSETS

RETURN ON PHYSICAL ASSETS

ECONOMIC PROFIT

# Data Set

*Three different analysis approaches in this analysis*

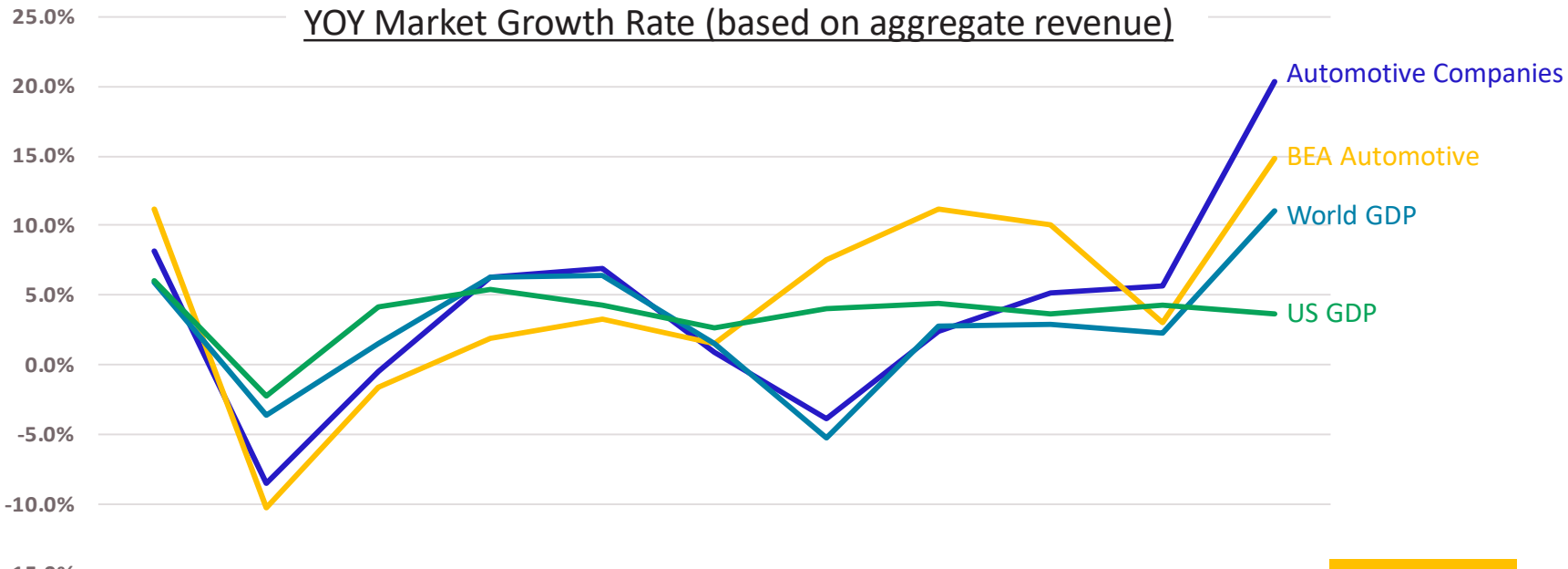
| APPROACH | DESCRIPTION | EXAMPLE | GOOD FOR |
|---|---|---|---|
| 1. Aggregate averages | Averages are computed by adding up all numbers from all companies. For example, the gross margin for the industry would be the sum of all revenue for all companies minus the sum of all COGS for all companies (divided by the sum of all revenue for all companies). | Average Gross Margin % = (sum of all revenues minus sum of all COGS) / sum of all revenues | Overall industry structure and operations; smooths outliers. |
| 2. Averages of percentages | Averages are computed by taking the averages of all percentages for all the companies. For example, the average gross margin % is the sum of all gross margin %s for all companies divided by the number of companies. | Average Gross Margin % = (sum of all gross margin %s) / (number of companies) | Comparison across companies. |
| 3. Quartile analysis | The market cap multiples of all companies are divided into quartiles. The operating characteristics of the top quartile companies are compared to the others. Likewise, measures for each company are divided into quartiles and the average market cap multiple within each quartile is shown. | 1) Isolate each quartile of market cap multiples; compare gross margin of leaders to others.<br>2) Isolate each quartile of gross margin; display average market cap multiple within each gross margin quartile. | Understanding characteristics of leaders. |

# Overall Market

Summary of the market using the companies in this report as a proxy for the overall Automotive market. Charts in this section use the “aggregate averages” approach.

# Overall Market

## *YOY growth rates, 2011-2021*




| | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2011-2021 CAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Automotive Companies | 8.2% | -8.5% | -0.5% | 6.3% | 6.9% | 0.9% | -3.9% | 2.4% | 5.2% | 5.6% | 20.4% | **3.9%** |
| BEA Automotive Output | 11.2% | -10.3% | -1.6% | 1.9% | 3.2% | 1.5% | 7.5% | 11.2% | 10.1% | 3.0% | 14.8% | **5.0%** |
| World GDP (current $) | 5.9% | -3.6% | 1.5% | 6.3% | 6.5% | 1.5% | -5.3% | 2.8% | 2.9% | 2.3% | 11.1% | **2.8%** |
| US GDP (current $) | 6.0% | -2.3% | 4.1% | 5.4% | 4.3% | 2.7% | 4.0% | 4.4% | 3.6% | 4.2% | 3.7% | **3.6%** |

## NOTES & INSIGHTS

- Automotive market CAGR for the past decade was 3.9%, which is higher than the global current dollar GDP growth rate (2.8%). CAGR is skewed higher by the early years of the 2010s as industry recovered from the great recession.
- BEA numbers are for US domestic manufacturing only. They are shown here for comparison purposes only.
- 2020 numbers reflect the extent to which automotive companies have been impacted by the pandemic
- Growth rates in the early part of the decade were higher, probably due to the rebound from the great recession of 2009-2010.

Notes:

1. "Automotive Companies" represents all companies in the data set for which there are year-over-year revenue numbers. The number of companies varies from year-to-year based on companies going public and some companies merging or being taken private as the decade progresses.
2. "BEA Automotive Output" growth is calculated from the US Bureau of Economic Analysis (https://apps.bea.gov/iTable/iTable.cfm?reqid=150&step=2&isuri=1&categories=gdpxind), GDP by Industry. Automotive output as defined here is based on output of the following sub-industries: Motor vehicles, bodies and trailers, and parts. BEA updates its past numbers periodically, so past reports may not reflect the same past BEA numbers.
3. World GDP and US GDP numbers are sourced from The World Bank (data.worldbank.org)
4. World GDP and US GDP growth rates are based on *current* dollars. This means they have not been adjusted for inflation. *Current* numbers are used to ensure apples-to-apples comparisons with Automotive market growth rates. Note that GDP growth rates are typically reported in constant dollars pegged to a certain year in order to account for the effect of price inflation. Thus, GDP growth rates commonly reported in media are typically lower than those shown here.

# Analysis Summary

*Operational ratios based on aggregate data, TTM[1]*

**3-YEAR CAGR[2]**
**1.5%**

**GROSS MARGIN**
**19.1%**

**MARKET CAP[3]**
**1.0X**

**NET PROFIT**
**5.0%**

**R&D**
**4.0%**

**SG&A**
**9.0%**

**INVENTORY TURNS**
**6.4**

**C2C (DAYS)**
**64.4**

**PP&E**
**38.3%**

**CAPEX**
**7.3%**

**FREE CASH FLOW**
**3.1%**

**ROIC**
**4.9%**

Notes:
1. All revenue and cost numbers are aggregate values for all companies for the trailing twelve months (TTM) as of the date on the cover of this report.
2. Growth rate is based on total dollars growth of the industry over the past four years.
3. Market capitalization ratio is aggregate market capitalization for all companies as of the date on the cover of this report divided by total revenue for all companies on TTM basis.

# Overall Market

## *Historical key metrics based on aggregate data, 2011-Current*

| | METRIC | TTM | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | AVG11-21 | HISTORY 2010 | HISTORY 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OPERATIONS | Growth Rate (3YRCAGR) | 1.5% | 0.8% | 0.8% | 3.3% | 2.6% | 1.6% | 1.1% | 2.1% | 7.6% | 5.2% | 5.6% | 20.4% | 4.6% | | |
| | Gross Margin | 19.1% | 18.7% | 17.4% | 18.4% | 19.1% | 19.8% | 20.2% | 19.3% | 19.1% | 18.7% | 17.9% | 18.6% | 18.8% | 18.3% | 25.2% |
| | SG&A % of Revenue | 9.0% | 9.1% | 9.6% | 9.2% | 9.0% | 9.1% | 9.4% | 9.1% | 9.1% | 8.9% | 9.1% | 9.1% | 9.1% | 9.5% | 14.3% |
| | R&D % of Revenue | 4.0% | 4.1% | 4.1% | 3.9% | 3.7% | 3.6% | 3.4% | 3.1% | 3.1% | 3.1% | 3.1% | 3.1% | 3.5% | 3.2% | 4.3% |
| | Inventory Turns (COGS/Inv) | 6.4 | 6.4 | 6.2 | 6.7 | 6.8 | 6.7 | 7.1 | 7.4 | 7.6 | 7.6 | 7.4 | 7.4 | 7.0 | 7.6 | 7.7 |
| | Days in Inventory | 57.4 | 57.3 | 58.5 | 54.3 | 54.0 | 54.8 | 51.6 | 49.6 | 47.9 | 48.0 | 49.6 | 49.5 | 52.3 | 47.9 | 47.4 |
| PROFIT & CASH FLOW | Operating Income | 6.9% | 6.2% | 4.2% | 5.7% | 6.5% | 7.1% | 7.2% | 6.5% | 6.6% | 6.3% | 5.3% | 6.6% | 6.2% | 5.5% | 5.3% |
| | Net Profit | 5.0% | 4.3% | 1.8% | 3.6% | 5.0% | 4.7% | 4.8% | 4.7% | 4.8% | 4.6% | 4.6% | 5.5% | 4.4% | 3.6% | 2.1% |
| | EBITDA | 13.6% | 14.0% | 11.0% | 11.9% | 12.9% | 13.5% | 13.3% | 12.5% | 12.6% | 12.2% | 12.0% | 12.7% | 12.6% | 11.6% | 12.1% |
| | Operating Cash Flow | 10.3% | 10.6% | 10.4% | 8.2% | 7.9% | 7.9% | 8.9% | 8.0% | 7.4% | 7.6% | 6.5% | 7.1% | 8.2% | 9.9% | 9.8% |
| | FCF % of Revenue | 3.1% | 3.2% | 2.8% | 0.7% | 0.5% | 0.2% | 1.1% | 0.2% | 0.3% | 0.5% | -0.2% | 1.0% | 0.9% | 4.6% | 1.4% |
| | CAPEX % of Revenue | 7.3% | 7.4% | 7.6% | 7.6% | 7.4% | 7.7% | 7.8% | 7.8% | 7.1% | 7.1% | 6.7% | 6.1% | 7.3% | 5.3% | 8.5% |
| | Stock Compensation | 0.7% | 0.7% | 0.6% | 0.4% | 0.4% | 0.4% | 0.3% | 0.3% | 0.2% | 0.2% | 0.2% | 0.2% | 0.4% | 0.2% | |
| | Days in Receivables | 71.0 | 72.8 | 78.6 | 74.8 | 70.3 | 72.3 | 68.1 | 65.5 | 60.3 | 61.2 | 63.7 | 63.6 | 68.3 | 65.8 | 68.0 |
| | Days in Payables | 63.9 | 66.7 | 67.4 | 60.6 | 62.0 | 65.2 | 62.3 | 58.5 | 57.3 | 57.9 | 59.3 | 57.4 | 61.3 | 60.8 | 58.2 |
| | Cash-to-Cash Cycle (Days) | 64.4 | 63.5 | 69.7 | 68.6 | 62.3 | 61.8 | 57.4 | 56.6 | 50.9 | 51.3 | 53.9 | 55.7 | 59.2 | 52.9 | 57.2 |
| ASSETS | Property, Plant, Equipment % | 38.3% | 39.4% | 42.6% | 37.6% | 35.4% | 36.4% | 35.1% | 32.3% | 30.0% | 30.0% | 29.5% | 28.3% | 34.2% | 28.8% | 33.9% |
| | Cash % of Revenue | 22.0% | 23.5% | 24.1% | 16.4% | 16.3% | 16.7% | 16.4% | 15.8% | 15.6% | 16.4% | 16.1% | 16.4% | 17.6% | 18.1% | 10.9% |
| | Debt % of Revenue | 53.9% | 55.6% | 60.4% | 50.8% | 44.6% | 45.0% | 45.9% | 44.0% | 41.8% | 41.9% | 38.6% | 35.4% | 45.8% | 43.1% | 42.5% |
| | Goodwill and Intangibles % of I | 12.8% | 13.1% | 13.7% | 11.8% | 11.6% | 11.7% | 11.8% | 11.2% | 10.6% | 11.3% | 11.1% | 9.8% | 11.6% | 9.0% | 6.3% |
| ROI | ROA | 3.3% | 2.7% | 1.1% | 2.5% | 3.6% | 3.4% | 3.5% | 3.7% | 3.9% | 3.8% | 3.8% | 4.6% | 3.3% | 2.9% | 1.7% |
| | ROIC | 4.9% | 4.1% | 1.6% | 3.9% | 5.7% | 5.4% | 5.6% | 5.8% | 6.2% | 6.0% | 6.4% | 8.1% | 5.3% | 4.7% | 3.0% |
| | Return on Physical Assets | 13.5% | 11.9% | 7.5% | 11.4% | 13.7% | 14.7% | 15.5% | 15.0% | 16.3% | 15.6% | 13.1% | 16.8% | 13.8% | 14.1% | 12.2% |
| | Economic Profit % of Revenue | 0.1% | -0.6% | -2.4% | -1.5% | 0.7% | 0.6% | 0.8% | 0.5% | 1.1% | 1.0% | 0.1% | 1.5% | 0.2% | -0.2% | -1.2% |
| CAP | Market Cap / Revenue | 1.0 | 1.0 | 1.1 | 0.8 | 0.5 | 0.4 | 0.7 | 0.6 | 0.6 | 0.6 | 0.7 | 0.5 | 0.7 | 0.5 | 0.8 |
| | Market Cap / EBITDA | 7.2 | 7.2 | 9.8 | 6.2 | 3.4 | 3.1 | 4.3 | 3.4 | 3.5 | 3.7 | 4.0 | 3.0 | 4.7 | 2.9 | 4.9 |

## NOTES & INSIGHTS

- This chart shows the operational structure of the industry today and for the past decade.
- These data indicate that the operational structure of the industry has remained relatively constant for the past decade.
- This indicates that industry operates around a certain "setpoint" driven by physics and physical characteristics.
- That said, individual companies deviate significantly from the overall structural setpoint, resulting in significantly different company-level operational results (next section).
- The final three years of CAGR are one-year growth rates (due to lack of data).
- Historical numbers beyond ten years have fewer companies and need further analysis for apples-to-apples comparisons.

# Analysis Summary

Charts that summarize key variables in the report. Charts in this section use the “averages of percentages” approach. In other words, it shows the averages of all percentages for all companies. (These numbers will differ from industry structural numbers in the previous section)

# Analysis Summary

## *Average and median for different variables, TTM*

*The table below contains the average and median values for the 150 companies investigated. This shows that the average Automotive company operates with a gross margin of 21.7% , spends 10.1% of revenue on SG&A, 4.7% on R&D, and has inventory turns of 6.9 , operating income of 6.7% , net income of 3.6% , free cash flow of 3.1% , and return on invested capital of 6.1%.*

| | REVENUE (TTM) | | OPERATIONS | | | | PROFIT AND CASH | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Annual Revenue ($M) | 3-Year CAGR | Gross Margin | SG&A | R&D | Inventory Turns | Operating Income | Net Income | Free Cash Flow | ROIC |
| Average | $21,059 | -0.6% | 21.7% | 10.1% | 4.7% | 6.9 | 6.7% | 3.6% | 3.1% | 6.1% |
| Median | $5,331 | -2.5% | 19.0% | 9.0% | 3.9% | 5.7 | 6.7% | 4.5% | 3.7% | 6.2% |

Notes:
1. TTM = trailing twelve months. All revenue and cost numbers are based on trailing twelve months results as of the date on the cover of this report. This report provides the averages of the percentages of all companies, including outliers.
2. Growth rate is based on the past four years of financial results
3. All percentage numbers are a percentage of revenue. Average is the average of all the percentages for each of the companies.

# Analysis Summary

## *Average values by revenue quartile, TTM[1]*

*Market cap multiples for smaller companies are larger than larger companies. SG&A and R&D costs are also significantly higher, with operating income, free cash flow and return on invested capital all significantly lower.*

All numbers are averages within each quartile

| | | REVENUE (TTM) | | MKT CAP | OPERATIONS | | | | PROFIT AND CASH | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # | Revenue($M) | 3-Year CAGR | Mkt Cap/ Revenue | Gross Margin | SG&A | R&D | Inventory Turns | Operating Income | Net Income | Free Cash Flow | ROIC |
| Quartile 4 | 38 | $68,562 | -0.6% | 1.3 | 18.9% | 8.7% | 3.9% | 6.7 | 5.8% | 3.5% | 3.3% | 4.7% |
| Quartile 3 | 37 | $10,573 | -1.5% | 0.7 | 22.1% | 8.7% | 3.3% | 7.0 | 7.3% | 5.4% | 4.6% | 10.7% |
| Quartile 2 | 37 | $3,385 | -1.4% | 1.5 | 21.8% | 10.0% | 5.8% | 9.2 | 7.8% | 4.6% | 3.5% | 5.6% |
| Quartile 1 | 38 | $976 | 0.9% | 1.3 | 23.8% | 12.9% | 5.6% | 5.0 | 5.8% | 1.1% | 0.9% | 3.4% |

REVENUE QUARTILES ($M)

Quartile 4 >= $16,656
Quartile 3 >= $5,331 , < $16,656
Quartile 2 >= $1,863 , < $5,331
Quartile 1 < $1,863

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2. Growth rate is based on the past four years of financial results
3. All percentage numbers are a percentage of revenue. Average is the average of all the percentages for each of the companies.

# Analysis Summary

*Average numbers for the entire data set, TTM[1]*

| | |
|---|---|
| 3-YEAR CAGR | -0.6% |
| GROSS MARGIN | 21.7% |
| MARKET CAP | 1.2X |
| NET PROFIT | 3.6% |
| R&D | 4.7% |
| SG&A | 10.1% |
| INVENTORY TURNS | 6.9 |
| C2C (DAYS) | 71.2 |
| PP&E | 31.6% |
| CAPEX | 5.2% |
| FREE CASH FLOW | 3.1% |
| ROIC | 6.1% |

Notes:
1. All revenue and cost numbers are based on trailing twelve months (TTM) results as of the date on the cover of this report for all companies in the data set.
2. All ratios shown here are averages of the ratios of each company.

# Analysis Summary

*Average numbers for the top-quartile market cap[1] multiple leaders*

**3-YEAR CAGR[2]**
**3.4%**

**GROSS MARGIN**
**28.7%**

**MARKET CAP**
**3.4X**

**NET PROFIT**
**6.6%**

**R&D**
**7.6%**

**SG&A**
**12.0%**

**INVENTORY TURNS**
**6.3**

**C2C (DAYS)**
**70.8**

**PP&E**
**32.0%**

**CAPEX**
**6.5%**

**FREE CASH FLOW**
**6.3%**

**ROIC**
**10.2%**

Notes:
1. All revenue and cost numbers are based on trailing twelve months (TTM) results as of the date on the cover of this report for all companies in the top quartile of market cap multiple performance.
2. All ratios shown here are averages of the ratios of each company.

# Analysis Summary

## *Key metric benchmarks and relationship to market cap multiple*

Average metric value within the quartile and corresponding average market cap within the quartile

| | *n=150* METRIC | INDUSTRY BENCHMARKS Q4 AVG | MEDIAN | Q1 AVG | MARKET CAP MULTIPLE Q4 AVG | Q1 AVG |
|---|---|---|---|---|---|---|
| OPERATIONS | 3-Year CAGR | 12.2% | -2.5% | -10.1% | 2.1 | 0.6 |
| | Gross Margin | 37.5% | 19.0% | 10.4% | 1.8 | 0.4 |
| | SG&A | 18.9% | 9.0% | 3.7% | 1.5 | 0.8 |
| | R&D | 10.0% | 6.7% | 1.1% | 3.0 | 0.7 |
| PROFIT | Operating Margin | 14.5% | 6.7% | -1.3% | 1.8 | 0.9 |
| | EBITDA Margin | 19.4% | 11.2% | 1.2% | 2.2 | 1.0 |
| | Net Profit Margin | 11.0% | 4.5% | -5.3% | 1.8 | 0.9 |
| CASH | Free Cash Flow | 13.0% | 3.7% | -8.5% | 1.8 | 0.9 |
| | CAPEX % of Revenue | 10.4% | 4.3% | 1.7% | 2.0 | 0.6 |
| | PP&E (net) % of Revenue | 56.1% | 27.9% | 12.5% | 1.4 | 0.8 |
| ROI | ROIC % of Revenue | 18.5% | 6.2% | -6.5% | 2.3 | 0.9 |
| | ROA % of Revenue | 11.7% | 4.3% | -3.7% | 1.8 | 0.9 |
| | ROPA % of Revenue | 39.9% | 14.2% | -2.7% | 1.8 | 1.0 |
| | onomic Profit % of Revenue | 7.1% | 1.4% | -7.2% | 2.4 | 1.0 |
| C2C | Inventory Turns | 13.1 | 5.7 | 3.1 | 1.1 | 1.3 |
| | Payables (days) | 127.9 | 64.2 | 34.7 | 1.3 | 1.1 |
| | Receivables (days) | 140.2 | 65.3 | 21.8 | 1.2 | 2.2 |
| | Cash-to-Cash (days) | 141.1 | 65.9 | -11.0 | 1.2 | 1.7 |

Gross margin is important to market performance, indicating product superiority and pricing power are paramount.

All forms of profitability have the highest correlation with market performance.

All forms of ROI are strong indicators of market performance, at about the same level as profitability.

Inventory turns and cash-to-cash (days) correlate little or negatively with market performance

Notes:

1. All metric numbers are based on trailing twelve months (TTM) results as of the date on the cover of this report. Market capitalization numbers are as of the date on the cover of this report.
2. This chart uses the averages and medians of the percentages of each company within a quartile and across the entire data set. Q4=top quartile; Q1=bottom quartile.
3. Source of all data is Calcbench and YCharts and Worldlocity analysis.

# Analysis Summary

## *Market cap multiple quartile comparison*

*This chart compares the operating characteristics of each market cap multiple quartile in order to glean insights into what cap leaders do differently. It summarizes the difference between the top and bottom quartiles in order to draw contrasts.*

| VARIABLE | DATA SET AVG | QUARTILE (AVGS WITHIN EACH CAP QUARTILE) TOP (Q4) | Q3 | Q2 | BOTTOM (Q1) | DIFFERENCE TOP-BOTTOM |
|---|---|---|---|---|---|---|
| Market Cap Multiple | 1.2 | 3.4 | 0.8 | 0.4 | 0.2 | 18.4X |
| 1-Year Growth | -0.6% | 3.4% | 0.3% | -1.5% | -4.8% | 8.1 pps |
| Gross Margin | 21.7% | 28.7% | 23.2% | 19.8% | 14.9% | 13.7 pps |
| SG&A | 10.1% | 12.0% | 10.5% | 10.2% | 7.7% | 4.4 pps |
| R&D | 4.7% | 7.6% | 3.6% | 4.0% | 3.4% | 4.3 pps |
| Operating Profit | 6.7% | 10.4% | 7.5% | 6.0% | 2.7% | 7.8 pps |
| Net Profit | 3.6% | 6.6% | 5.6% | 3.7% | -1.4% | 8.0 pps |
| Inventory Turns | 6.9 | 6.3 | 5.9 | 6.4 | 9.2 | -2.9 Turns |
| C2C Cycle (days) | 71.2 | 70.8 | 69.7 | 68.9 | 75.1 | -4.3 Days |
| Net Cash | -14.7% | -1.2% | -17.9% | -18.7% | -21.2% | 20.0 pps |
| CAPEX | 5.2% | 6.5% | 5.2% | 4.7% | 4.5% | 2.1 pps |
| Free Cash Flow | 3.1% | 6.3% | 4.8% | 2.9% | -1.7% | 8.0 pps |
| ROIC | 6.1% | 10.2% | 9.3% | 5.3% | -0.6% | 10.8 pps |
| Return on Physical Assets | 16.8% | 24.5% | 21.2% | 14.0% | 7.6% | 16.9 pps |
| Economic Profit | 0.7% | 2.8% | 1.7% | 0.4% | -2.3% | 5.1 pps |

## NOTES & INSIGHTS

- Leaders have market cap multiples that are 2.8X average, and 18.4X laggards.
- Leaders have significantly higher gross margins and investments in R&D. This is perhaps a chicken-and-egg question: does the higher investment in R&D result in a higher gross margin product, or does the higher gross margin product allow for a higher investment in R&D? It is likely a symbiotic and self-reinforcing relationship.
- Leaders excel in all forms of profitability, cash flow, and return on investment.
- Paradoxically, cap leaders do not lead in inventory turns. Cap laggards are more likely to lead in inventory turns than cap leaders. This is likely because cap leaders are managing their supply chains as profit centers and cap laggards are solely focused on cost.
- All financial numbers are for the trailing twelve months as of the date on the cover of this report. All market cap numbers are as of the date on the cover of this report.

# Appendix

Additional supporting material and notes.

# Notes and Definitions

1. Primary data sources for the analysis are YCharts and Calcbench.
2. Companies included in this analysis are filtered based on available financial, operational, and market cap data. Some significant companies in certain industries have been excluded because of lack of market capitalization data from the primary data sources.
3. Free cash flow = operating cash flow minus CAPEX.
4. ROA = return on assets = net income divided by total assets.
5. ROIC = return on invested capital = net income divided by (total debt plus equity).
    1. Note: the formal definition of ROIC uses NOPAT in the numerator. Furthermore, some companies may employ their own specific definition. The results here will be close to the formal definition, but generally slightly less.
6. ROCE = return on capital employed = EBIT divided by capital employed. Capital employed = total assets minus total current liabilities.
7. ROPA = return on physical assets = operating profit divided by (PP&E (net) plus inventory).
8. Economic profit = net operating profit after taxes (NOPAT) minus weighted average cost of capital (WACC) times capital invested. Capital invested = Equity plus the non-current portion of debt. WACC is industry-specific, as publicly reported by Aswath Damodaran, NYU Stern Business School.
9. Inventory turns = COGS (end of period) divided by inventory (end of period).
10. C2C = cash-to-cash in days = days in receivables plus days in inventory minus days in payables.
11. TTM = trailing twelve months results. TTM results are pegged to the most recent quarterly results for each company as of the date on the cover of the report.
12. Historical data is captured for the previous eleven fiscal years for all companies. The number of companies grows for each year in the historical analysis, as more companies became public across the decade.
13. In the case of companies formed from mergers, the oldest company is used to designate the resultant company founding year.
14. 3-Year CAGR is based on the past four years of annual financial data.
15. Market capitalization is based on the stock prices as of the date on the cover of this report for each company. Market cap to revenue ratios are market capitalization divided by trailing twelve months (TTM) revenue through the most recently reported fiscal quarter as of the date on the cover of this report.
16. EBITDA is calculated as operating income plus depreciation and amortization.
17. Adjusted EBITDA = EBITDA minus stock compensation
18. Cash = cash, cash equivalents, and marketable securities.
19. Total debt includes short-term debt, the current portion of long-term debt, long-term debt, borrowings under credit facility, capital lease obligations, convertible notes, and deferred rent.
20. CAPEX = gross CAPEX, in other words it does not net out the sale of assets.
21. Enterprise value (EV) = market cap plus total debt minus cash.
22. Most companies allocate depreciation and amortization costs to individual cost buckets, including cost of revenue, SG&A, and R&D. Some subset of companies explicitly show depreciation and amortization costs on the income statement after the other cost buckets. No attempt was made to reallocate these costs for this subset of companies. This has the effect of understating COGS, SG&A, and R&D for those companies.
23. Individual company YOY numbers may be distorted due to mergers and acquisitions. No attempt has been made to normalize for mergers, acquisitions, and divestitures.

# Notes and Definitions

24. Aggregate inventory turns is calculated as follows: sum of all COGS for all companies in an industry divided by sum of all inventories for all companies in an industry. In a certain small number of cases, companies do not have an inventory entry on their balance sheets. In this case, to maintain consistency across calculations, inventory is assumed to be zero for those companies. This is most prevalent in service-oriented industries such as transportation and wholesale distribution, where certain companies own zero inventory. This may have the effect of slightly overstating aggregate inventory turns versus if the calculation were only done for those companies that carry inventory. (Note: in goods-producing industries, companies without COGS or without inventories have been filtered out of the analysis).

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