

Telecommunication Industry Operating Benchmarks

Operational and market capitalization data for 113
telecommunication companies

1-Jan-2022







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.

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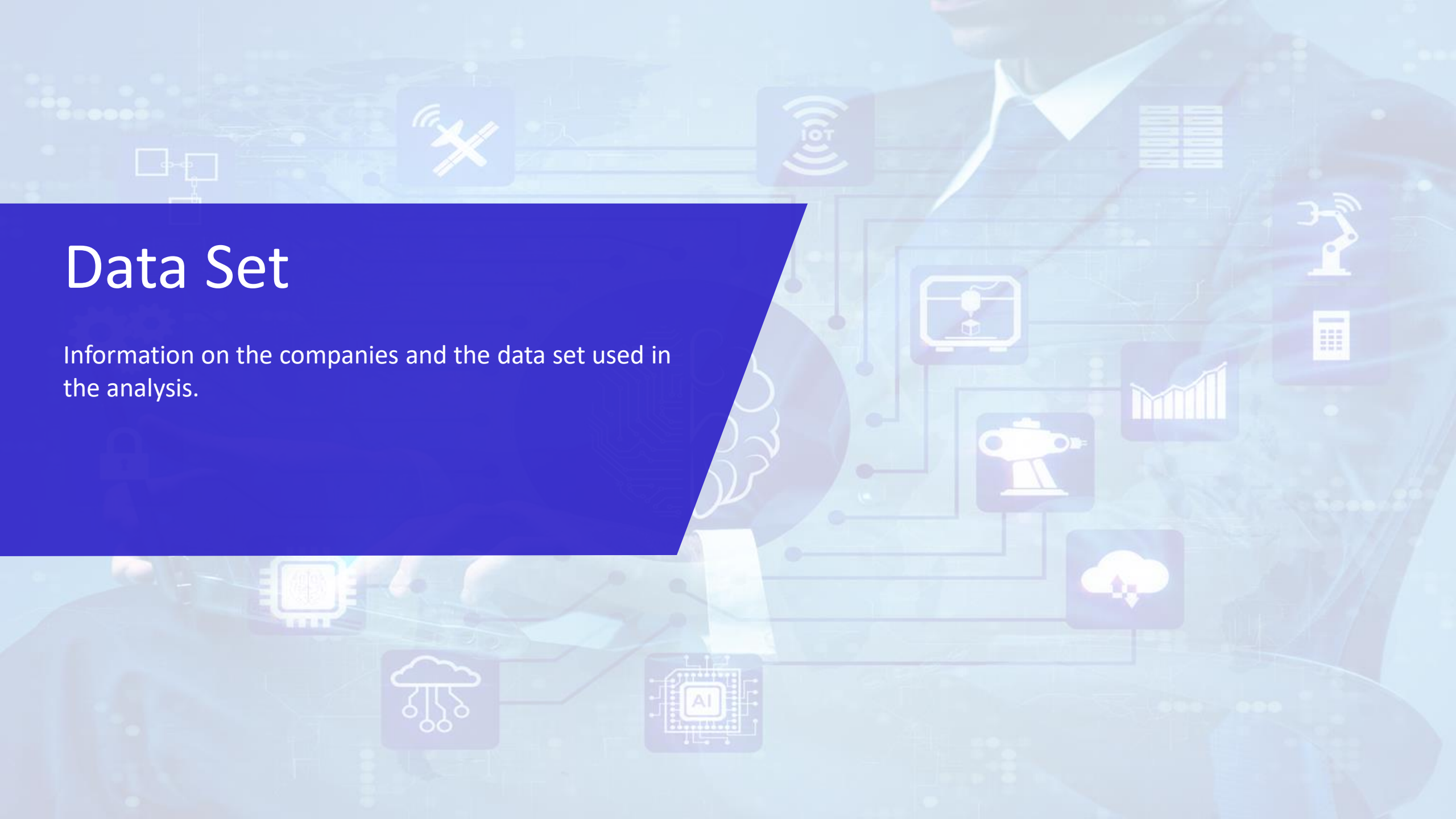
2022 Telecommunication Industry Report: Key Takeaways



- The Telecommunication industry 3-year CAGR is 1.6% (overall dollars growth). The average company 3-year CAGR is 1.0%.
- The average Telecommunication company has gross margins of 56.5% , invests 17.1% of revenue in selling, general, and administrative expense, 6.2% in research and development, and generates 15.0% operating margin, 36.1% EBITDA margin, 10.4% free cash flow, and 6.8% return on invested capital.
- The Telecommunication company average inventory turns is 41.9 . The median is 22.0 . 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 Telecommunication company has 107.5% PP&E, and 75.3% in goodwill and intangibles, all as a percentage of revenue. Goodwill and intangibles are a proxy for mergers and acquisitions; based on this measure, Telecommunication is among the highest industries in mergers and acquisitions.
- Telecommunication companies are asset intensive, with a high level of investment in PP&E as a percentage of revenue; the best indicator of market cap multiple is return on investment (ROA, ROIC, ROCE, and economic profit).
- Telecommunication 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).
- Telecommunication companies require significant CAPEX in order to be competitive.
- 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 2.4X average and 9.7X laggards. Leaders have significantly higher 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 113 publicly-traded Telecommunication companies.



113



REVENUE

Aggregate revenue for companies in the data set is \$1.5 trillion for the latest reporting fiscal year as of the date on the cover of this report.



\$1.5T



MARKET CAPITALIZATION

Aggregate market cap for companies in the data set is \$1.9 trillion as of date on the cover of this report.



\$1.9T

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

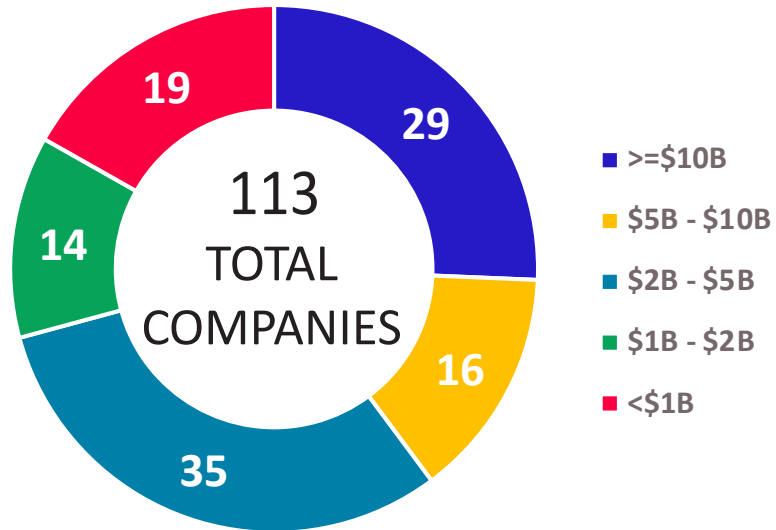
Advanced Info Service P	Deutsche Telekom AG	Koninklijke KPN NV	PLDT Inc	Suny Cellular Communica	Total Access Communicat
Altice USA Inc	Digi.com Bhd	KT Corp	Proximus SA	Swisscom AG	TPG Telecom Ltd
America Movil SAB de CV	Elisa Oyj	Liberty Latin America L	PT Indosat Tbk	TDC A/S	Trilogy International P
AT&T Inc	freenet AG	LINK Mobility Group Hol	PT Sarana Menara Nusant	Tele2 AB	True Corp PCL
ATN International Inc	Gamma Communications P	Lumen Technologies Inc	PT Telkom Indonesia (Pe	Telecom Argentina SA	Turk Telekomunikasyon A
Axiata Group Bhd	Globe Telecom Inc	Magyar Telekom PLC	PT Tower Bersama Infrac	Telecom Italia SpA	Turkcell Iletisim Hizme
Axtel SAB de CV	GMO internet Inc	Maroc Telecom SA	PT XL Axiata TBK	Telefonica Brasil SA	United Internet AG
BCE Inc	Gogo Inc	Maxis Bhd	Quebecor Inc	Telefonica Deutschland	United States Cellular
Bezeq The Israeli Telec	Hellenic Telecommunicat	Millicom International	Ribbon Communications I	Telefonica SA	VEON Ltd
BT Group PLC	HKBN Ltd	Mobile TeleSystems PJSC	Rogers Communications I	Telekom Austria AG	Verizon Communications
Cable One Inc	HKT Trust and HKT Ltd	MTN Group Ltd	Rostelecom PJSC	Telenet Group Holding N	Vodacom Group Ltd
Cablevision Holding SA	Hutchison Telecommunica	Nippon Telegraph & Tele	Shaw Communications Inc	Telenor ASA	Vodafone Group PLC
Cellcom Israel Ltd	IDT Corp	Nos Sgps SA	Shenandoah Telecommuni	Telephone and Data Syst	Vonage Holdings Corp
China Communications Se	Iliad SA	Oi SA	Sify Technologies Ltd	Telesites SAB de CV	
China Tower Corp Ltd	Intelsat SA	Okinawa Cellular Teleph	Singapore Telecommunica	Telia Company AB	
Chunghwa Telecom Co Ltd	InterDigital Inc	Orange Belgium SA	SK Telecom Co Ltd	Telkom SA SOC Ltd	
Cogeco Communications I	Internet Initiative Jap	Orange Polska SA	SoftBank Corp	Telstra Corp Ltd	
Cogeco Inc	Iridium Communications	Orange SA	SoftBank Group Corp	TELUS Corp	
Cogent Communications H	Kaleyra Inc	Partner Communications	Spark New Zealand Ltd	TIM SA	
Consolidated Communicat	KDDI Corp	PCCW Ltd	StarHub Ltd	T-Mobile US Inc	

Data Set

Company distribution

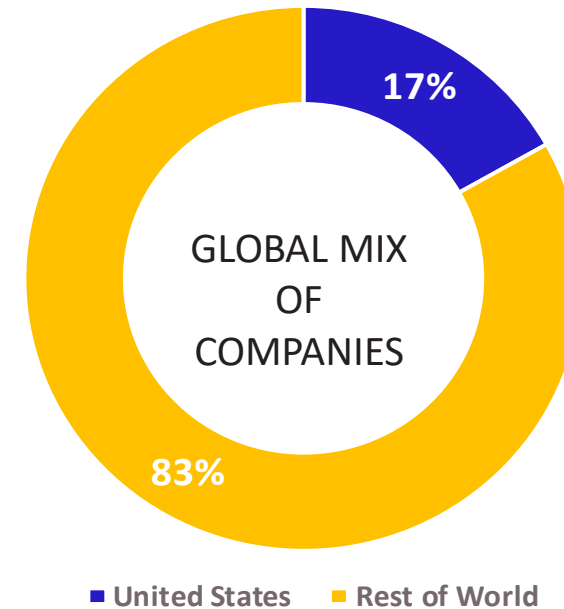


BY ANNUAL REVENUE



MEDIAN REVENUE = **\$3,722M**

GEOGRAPHIC REGION



- Notes:
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 2. All market capitalizations are as of the date on the cover of this report.
 3. M=million; B=billion; T=trillion.

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 ten-year historical period.

REVENUE	CASH	INVENTORY
GROWTH RATE	DEBT	DAYS IN PAYABLES
GROSS MARGIN	NET CASH	DAYS IN RECEIVABLES
SELLING, GENERAL, AND ADMIN	EBITDA	CASH-TO-CASH CYCLE
RESEARCH & DEVELOPMENT	EQUITY	CAPITALIZATION TO REVENUE
REVENUE PER EMPLOYEE	CAPITAL EXPENDITURES (CAPEX)	CAPITALIZATION TO EBITDA
OPERATING PROFIT	PROPERTY, PLANT, AND EQUIPMENT (PP&E, NET)	RETURN ON INVESTED CAPITAL
NET PROFIT	GOODWILL	RETURN ON ASSETS
FREE CASH FLOW	DEFERRED REVENUE	RETURN ON PHYSICAL ASSETS
STOCK COMPENSATION	REMAINING PERFORMANCE OBLIGATIONS (RPOS)	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 % = $\frac{(\text{sum of all revenues minus sum of all COGS})}{\text{sum of all revenues}}$	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 % = $\frac{(\text{sum of all gross margin \%s})}{(\text{number of companies})}$	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.	<ol style="list-style-type: none">1) Isolate each quartile of market cap multiples; compare gross margin of leaders to others.2) Isolate each quartile of gross margin; display average market cap multiple within each gross margin quartile.	Understanding characteristics of leaders.

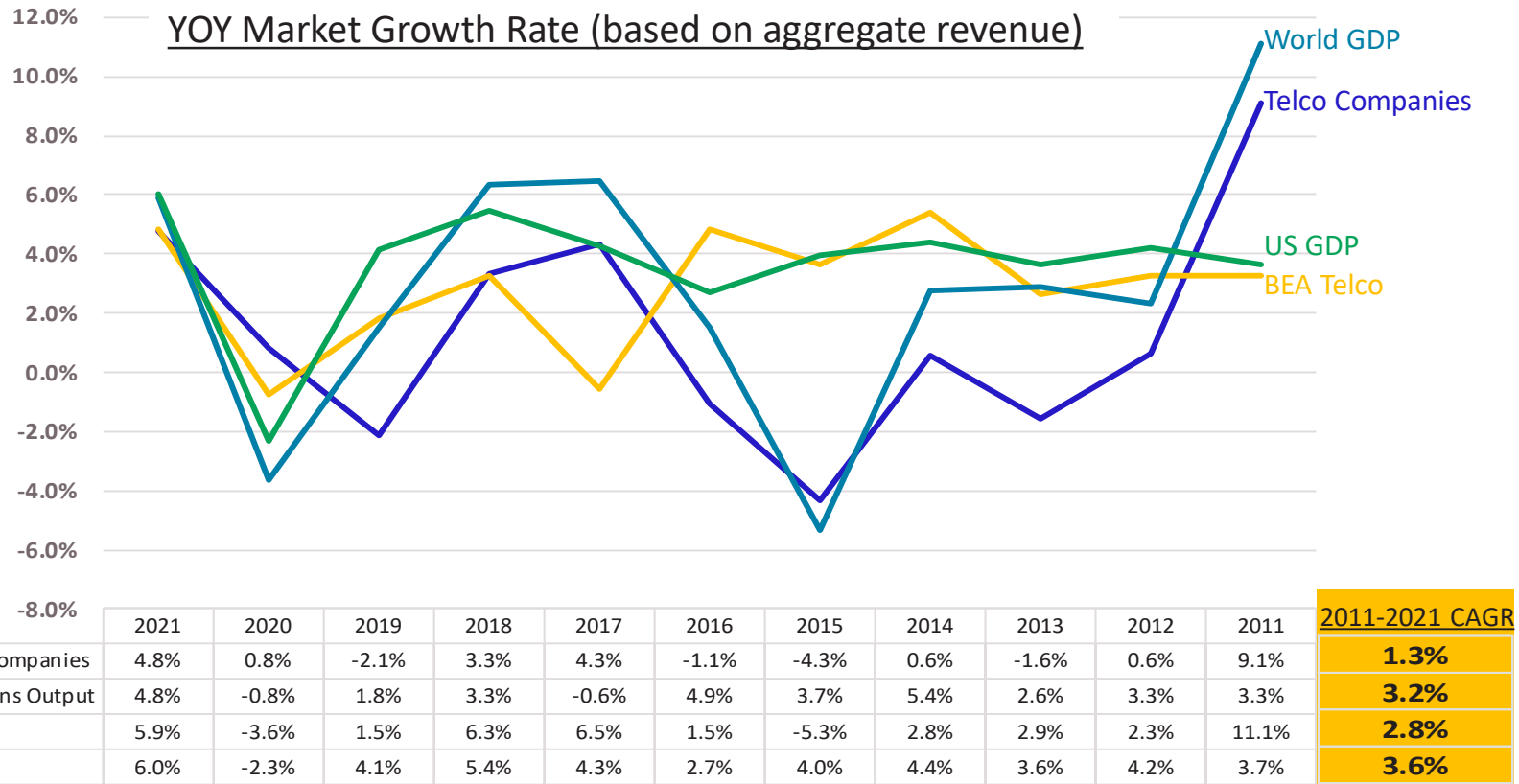
Overall Market

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



Overall Market

YOY growth rates, 2011-2021



NOTES & INSIGHTS

- Telecommunication market CAGR for the past decade was 1.3%, which is lower than the global current dollar GDP growth rate (2.8%). It is also lower than BEA Telco growth rate numbers (3.2%).
- BEA numbers are for US domestic output only and are shown here for comparison purposes only.
- 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. "Telecommunication 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 Telecommunication 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=gdpixind>), GDP by Industry. Telecommunication output as defined here is based on output of the following sub-industries: Broadcasting and telecommunications. 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 Telecommunication 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.

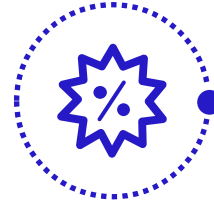
Analysis Summary

Operational ratios based on aggregate data, TTM¹



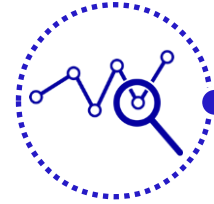
3-YEAR CAGR²

1.6%



GROSS MARGIN

57.6%



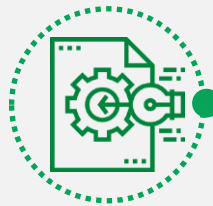
MARKET CAP³

1.3X



NET PROFIT

10.1%



R&D

1.6%



SG&A

19.1%



INVENTORY TURNS

21.4



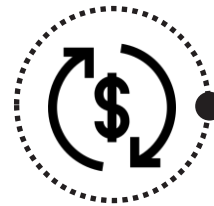
C2C (DAYS)

-65.9



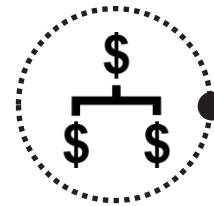
PP&E

86.5%



CAPEX

20.5%



FREE CASH FLOW

6.1%



ROIC

5.4%

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	
OPERATIONS	Growth Rate (3YRCAGR)	1.6%	1.6%	1.5%	1.1%	0.6%	-0.1%	-1.6%	-1.2%	2.0%	-1.6%	0.6%	9.1%	1.1%	
	Gross Margin	57.6%	57.6%	58.3%	57.7%	56.5%	54.0%	54.5%	54.9%	55.4%	56.8%	56.9%	57.2%	56.3%	
	SG&A % of Revenue	19.1%	18.9%	19.2%	19.4%	19.3%	20.2%	20.7%	21.5%	22.2%	21.8%	23.8%	23.8%	21.0%	
	R&D % of Revenue	1.6%	1.6%	1.6%	1.5%	1.5%	1.6%	1.5%	1.4%	1.0%	0.8%	0.8%	0.8%	1.3%	
	Inventory Turns (COGS/Inv)	21.4	21.4	21.9	21.2	21.1	24.1	24.0	23.7	24.5	25.2	25.4	26.1	23.5	
	Days in Inventory	17.0	17.0	16.7	17.2	17.3	15.1	15.2	15.4	14.9	14.5	14.4	14.0	15.6	
PROFIT & CASH FLOW	Operating Income	15.3%	15.5%	15.3%	16.3%	15.0%	14.6%	14.3%	14.6%	14.0%	17.5%	15.7%	16.3%	15.4%	
	Net Profit	10.1%	11.1%	5.3%	7.2%	8.3%	10.1%	6.4%	7.4%	13.7%	7.8%	6.4%	6.8%	8.2%	
	EBITDA	37.9%	38.1%	33.4%	34.1%	32.3%	31.3%	30.8%	30.6%	29.6%	31.8%	30.6%	31.6%	32.2%	
	Operating Cash Flow	26.6%	25.9%	26.2%	24.0%	22.2%	22.0%	20.6%	21.6%	21.3%	23.2%	23.6%	24.2%	23.2%	
	FCF % of Revenue	6.1%	5.6%	9.5%	7.5%	6.0%	4.8%	3.1%	3.1%	3.9%	6.0%	7.3%	8.2%	5.9%	
	CAPEX % of Revenue	20.5%	20.4%	16.7%	16.5%	16.2%	17.1%	17.5%	18.6%	17.4%	17.2%	16.3%	16.0%	17.3%	
	Stock Compensation	0.5%	0.5%	0.5%	0.5%	0.4%	0.3%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%	0.4%
	Days in Receivables	62.2	62.1	63.8	65.6	64.8	61.6	56.9	51.1	52.0	50.2	53.8	49.3	57.4	
	Days in Payables	145.1	145.9	130.4	129.7	125.4	119.0	121.8	117.5	105.5	100.7	111.1	100.8	118.9	
	Cash-to-Cash Cycle (Days)	-65.9	-66.8	-49.9	-46.9	-43.4	-42.3	-49.7	-51.0	-38.6	-36.0	-43.0	-37.5	-45.9	
ASSETS	Property, Plant, Equipment %	86.5%	87.5%	91.5%	84.4%	72.1%	73.2%	73.4%	69.9%	68.3%	68.7%	69.8%	68.1%	75.2%	
	Cash % of Revenue	17.5%	19.0%	17.8%	14.7%	12.2%	15.2%	12.9%	13.0%	14.3%	17.2%	12.3%	12.4%	14.6%	
	Debt % of Revenue	112.1%	111.4%	112.1%	93.7%	80.2%	81.0%	80.4%	76.6%	73.1%	71.1%	64.5%	58.3%	82.0%	
	Goodwill and Intangibles % of	94.0%	94.7%	92.5%	86.8%	87.8%	83.8%	81.5%	76.5%	70.5%	64.7%	64.5%	67.5%	79.2%	
ROI	ROA	3.7%	4.1%	1.9%	2.9%	3.6%	4.6%	2.9%	3.6%	6.9%	3.9%	3.3%	3.6%	3.8%	
	ROIC	5.4%	5.9%	2.8%	4.3%	5.5%	6.8%	4.4%	5.5%	10.4%	5.9%	5.0%	5.5%	5.7%	
	Return on Physical Assets	17.3%	17.3%	16.4%	18.8%	20.2%	19.5%	18.9%	20.3%	20.0%	24.9%	22.0%	23.3%	20.1%	
	Economic Profit % of Revenue	3.7%	3.8%	-5.3%	2.7%	4.4%	6.0%	5.1%	3.0%	-0.5%	4.0%	6.2%	4.4%	3.1%	
CAP	Market Cap / Revenue	1.3	1.3	1.3	1.4	1.4	1.3	1.4	1.3	1.2	1.3	1.4	1.1	1.3	
	Market Cap / EBITDA	3.3	3.3	3.9	4.0	4.1	3.8	4.3	4.1	3.9	3.8	4.1	3.3	3.9	

HISTORY

	2010	2000
Growth Rate (3YRCAGR)		
Gross Margin	56.7%	49.9%
SG&A % of Revenue	22.6%	20.7%
R&D % of Revenue	1.0%	1.4%
Inventory Turns (COGS/Inv)	26.5	16.0
Days in Inventory	13.8	22.8
Operating Income	17.7%	25.4%
Net Profit	11.3%	10.7%
EBITDA	35.1%	48.8%
Operating Cash Flow	24.9%	21.9%
FCF % of Revenue	9.6%	-3.6%
CAPEX % of Revenue	15.3%	25.5%
Stock Compensation	0.3%	
Days in Receivables	45.1	72.1
Days in Payables	99.1	151.5
Cash-to-Cash Cycle (Days)	-40.1	-56.6
Property, Plant, Equipment %	70.8%	108.7%
Cash % of Revenue	11.1%	11.2%
Debt % of Revenue	63.5%	91.8%
Goodwill and Intangibles % of	70.3%	59.5%
ROA	5.7%	3.7%
ROIC	8.5%	5.1%
Return on Physical Assets	24.4%	22.8%
Economic Profit % of Revenue	5.9%	3.2%
Market Cap / Revenue	1.2	2.5
Market Cap / EBITDA	3.1	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 113 companies investigated. This shows that the average Telecommunication company operates with a gross margin of **56.5%**, spends **17.1%** of revenue on SG&A, **6.2%** on R&D, and has inventory turns of **41.9**, operating income of **15.0%**, net income of **11.3%**, free cash flow of **10.4%**, and return on invested capital of **6.8%**.

	REVENUE (TTM)		OPERATIONS				PROFIT AND CASH			ROIC
	Annual Revenue (\$M)	3-Year CAGR	Gross Margin	SG&A	R&D	Inventory Turns	Operating Income	Net Income	Free Cash Flow	
Average	\$13,299	1.0%	56.5%	17.1%	6.2%	41.9	15.0%	11.3%	10.4%	6.8%
Median	\$3,722	0.6%	56.9%	15.4%	2.0%	22.0	14.0%	7.9%	11.5%	6.0%

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, TTM¹

Market cap multiples are consistent across the revenue quartiles. Gross margins and profit are lower for the smallest companies but consistent in the top three quartiles.

All numbers are averages within each quartile

	#	REVENUE (TTM)		MKT CAP Mkt Cap/ Revenue	OPERATIONS				PROFIT AND CASH			ROIC
		Revenue(\$M)	3-Year CAGR		Gross Margin	SG&A	R&D	Inventory Turns	Operating Income	Net Income	Free Cash Flow	
Quartile 4	29	\$43,028	1.0%	1.3	58.9%	19.9%	1.0%	26.7	15.2%	10.3%	10.3%	6.2%
Quartile 3	28	\$5,839	0.3%	1.6	60.5%	14.8%	1.3%	28.1	16.6%	9.1%	9.3%	6.9%
Quartile 2	28	\$2,493	-1.0%	1.5	55.6%	14.4%	0.1%	84.4	13.0%	6.5%	7.9%	6.2%
Quartile 1	28	\$774	3.8%	3.9	51.0%	19.4%	12.5%	25.6	15.3%	19.5%	13.8%	8.2%

REVENUE QUANTILES (\$M)

Quartile 4 >= \$10,105

Quartile 3 >= \$3,722 , < \$10,105

Quartile 2 >= \$1,608 , < \$3,722

Quartile 1 < \$1,608

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.

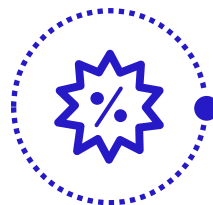
Analysis Summary

Average numbers for the entire data set, TTM¹



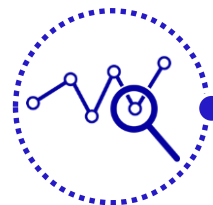
3-YEAR CAGR

1.0%



GROSS MARGIN

56.5%



MARKET CAP

2.0X



NET PROFIT

11.3%



R&D

6.2%



SG&A

17.1%



INVENTORY TURNS

41.9



C2C (DAYS)

-94.2



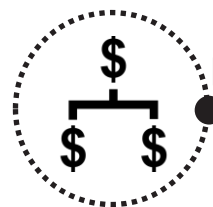
PP&E

107.5%



CAPEX

20.1%



FREE CASH FLOW

10.4%



ROIC

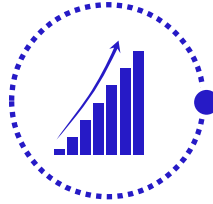
6.8%

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.

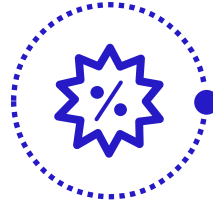
Analysis Summary

Average numbers for the top-quartile market cap¹ multiple leaders



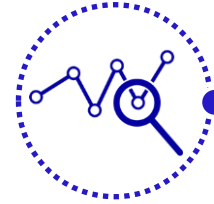
3-YEAR CAGR²

0.7%



GROSS MARGIN

62.9%



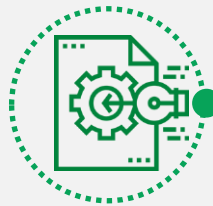
MARKET CAP

4.8X



NET PROFIT

26.9%



R&D

8.7%



SG&A

18.3%



INVENTORY TURNS

58.1



C2C (DAYS)

-89.4



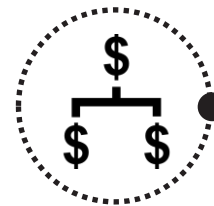
PP&E

157.6%



CAPEX

20.6%



FREE CASH FLOW

18.5%



ROIC

11.4%

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=113 METRIC	INDUSTRY BENCHMARKS			MARKET CAP MULTIPLE		
		Q4 AVG	MEDIAN	Q1 AVG	Q4 AVG	Q1 AVG	
OPERATIONS	3-Year CAGR	12.5%	0.6%	-9.7%	3.4	1.7	
	Gross Margin	79.4%	56.9%	31.9%	3.1	1.4	← This is one of the few industries in which gross margin is not a clear determinant of market cap multiple.
	SG&A	34.4%	15.4%	2.9%	2.0	2.8	
	R&D	17.7%	14.0%	0.3%	3.6	0.9	
PROFIT	Operating Margin	29.4%	14.0%	2.1%	3.5	1.7	← All forms of profitability have the highest correlation with market performance.
	EBITDA Margin	55.9%	36.5%	16.5%	3.3	1.3	
	Net Profit Margin	35.4%	7.9%	-6.8%	3.4	1.6	
CASH	Free Cash Flow	26.6%	11.5%	-8.3%	2.9	1.1	
	CAPEX % of Revenue	38.1%	16.8%	6.7%	2.4	2.6	
	PP&E (net) % of Revenue	222.9%	87.3%	30.7%	3.2	1.8	
ROI	ROIC % of Revenue	20.0%	6.0%	-4.4%	2.2	1.9	← All forms of ROI are strong indicators of market performance, at about the same level as profitability.
	ROA % of Revenue	11.3%	4.1%	-2.4%	2.3	1.9	
	ROPA % of Revenue	44.2%	16.3%	3.2%	2.1	1.8	
	Economic Profit % of Revenue	24.6%	3.0%	-21.1%	3.3	2.0	
C2C	Inventory Turns	113.0	22.0	9.2	1.7	2.8	← Inventory turns and cash-to-cash (days) correlate little or negatively with market performance
	Payables (days)	47.7	16.6	6.5	2.8	1.7	
	Receivables (days)	514.8	65.4	28.9	1.4	2.1	
	Cash-to-Cash (days)	120.5	-26.2	-373.6	2.7	1.6	

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.

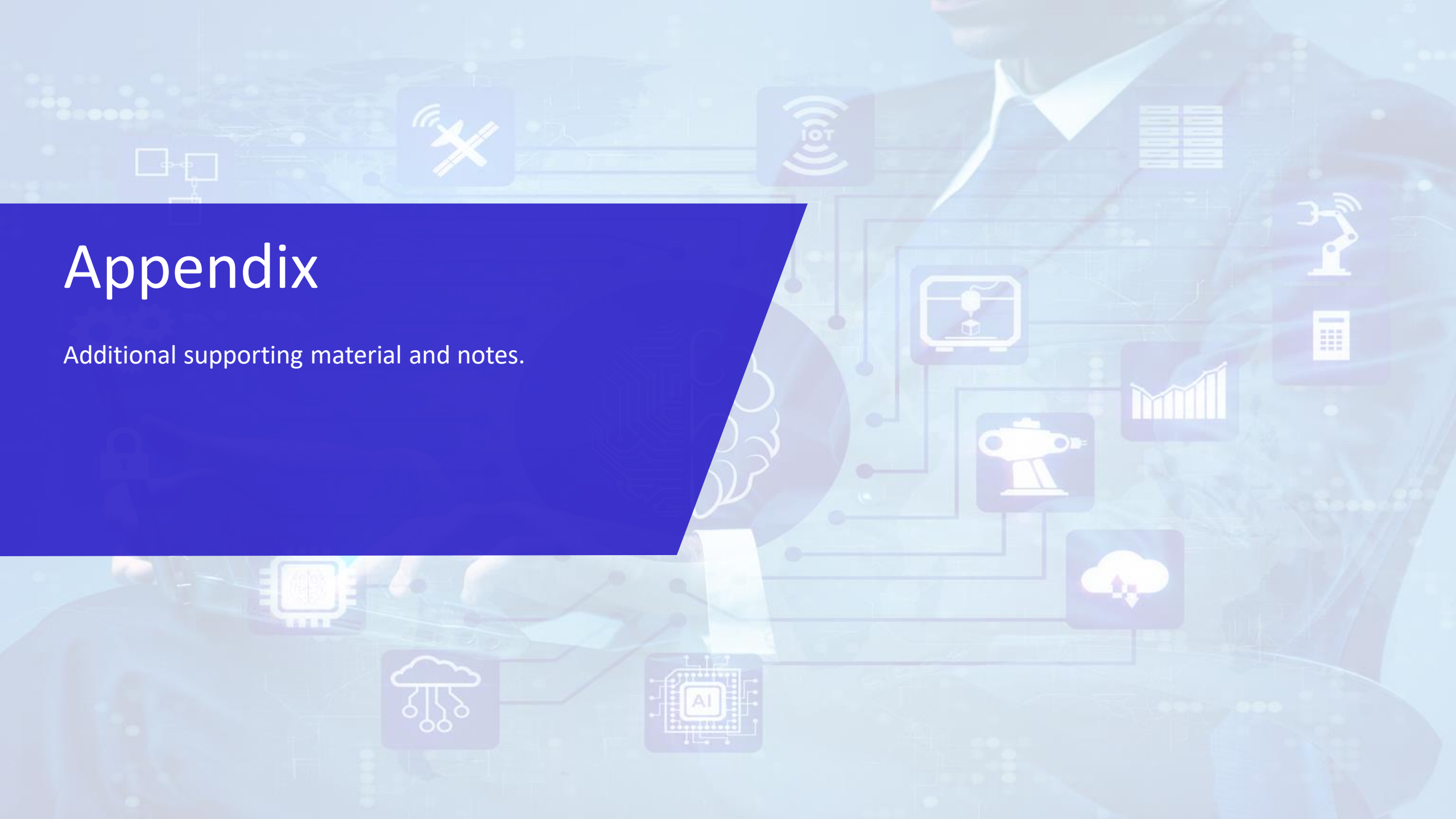
VARIABLE	DATA SET	QUARTILE (AVGS WITHIN EACH CAP QUARTILE)				DIFFERENCE
	AVG	TOP (Q4)	Q3	Q2	BOTTOM (Q1)	TOP-BOTTOM
Market Cap Multiple	2.0	4.8	1.7	1.0	0.5	9.7X
1-Year Growth	1.0%	0.7%	2.9%	1.4%	-0.8%	1.5 pps
Gross Margin	56.5%	62.9%	56.3%	52.3%	54.4%	8.6 pps
SG&A	17.1%	18.3%	15.2%	15.2%	19.7%	-1.4 pps
R&D	6.2%	8.7%	5.3%	11.4%	1.2%	7.5 pps
Operating Profit	15.0%	23.5%	14.4%	11.9%	10.0%	13.6 pps
Net Profit	11.3%	26.9%	9.2%	7.1%	1.6%	25.3 pps
Inventory Turns	41.9	58.1	26.9	55.6	27.1	31.0 Turns
C2C Cycle (days)	-94.2	-89.4	-206.4	-37.2	-43.7	-45.7 Days
Net Cash	-89.6%	-98.5%	-94.4%	-68.5%	-96.8%	-1.7 pps
CAPEX	20.1%	20.6%	20.8%	15.7%	23.3%	-2.6 pps
Free Cash Flow	10.4%	18.5%	12.4%	10.7%	0.2%	18.3 pps
ROIC	6.8%	11.4%	5.0%	8.2%	2.6%	8.8 pps
Return on Physical Assets	20.3%	28.7%	17.7%	18.6%	15.9%	12.7 pps
Economic Profit	2.1%	7.0%	-0.6%	0.4%	1.5%	5.5 pps

NOTES & INSIGHTS

- Leaders have market cap multiples that are 2.4X average, and 9.7X laggards.
- The one clear determinant of leaders is return on investment; top quartile market cap multiple leaders excel in all forms of ROI (ROA, ROIC, ROCE and EP). This makes sense given Telecommunication is a capital-intensive industry requiring high levels of CAPEX.
- Inventory is not a significant factor for most Telecommunication companies. These companies are largely service providers and must deploy significant physical assets in order to competitively deliver such service.
- 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 such as Samsung and LG 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. Unless otherwise noted, all data are based on the most recent fiscal year (MRY) for each company, as reported in the SEC EDGAR database as of the date on the cover of this report.
12. Historical data is for fiscal years 2010-2020 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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