

PRIVATE COMPANY OPERATING METRICS: GLOBAL ANALYSIS

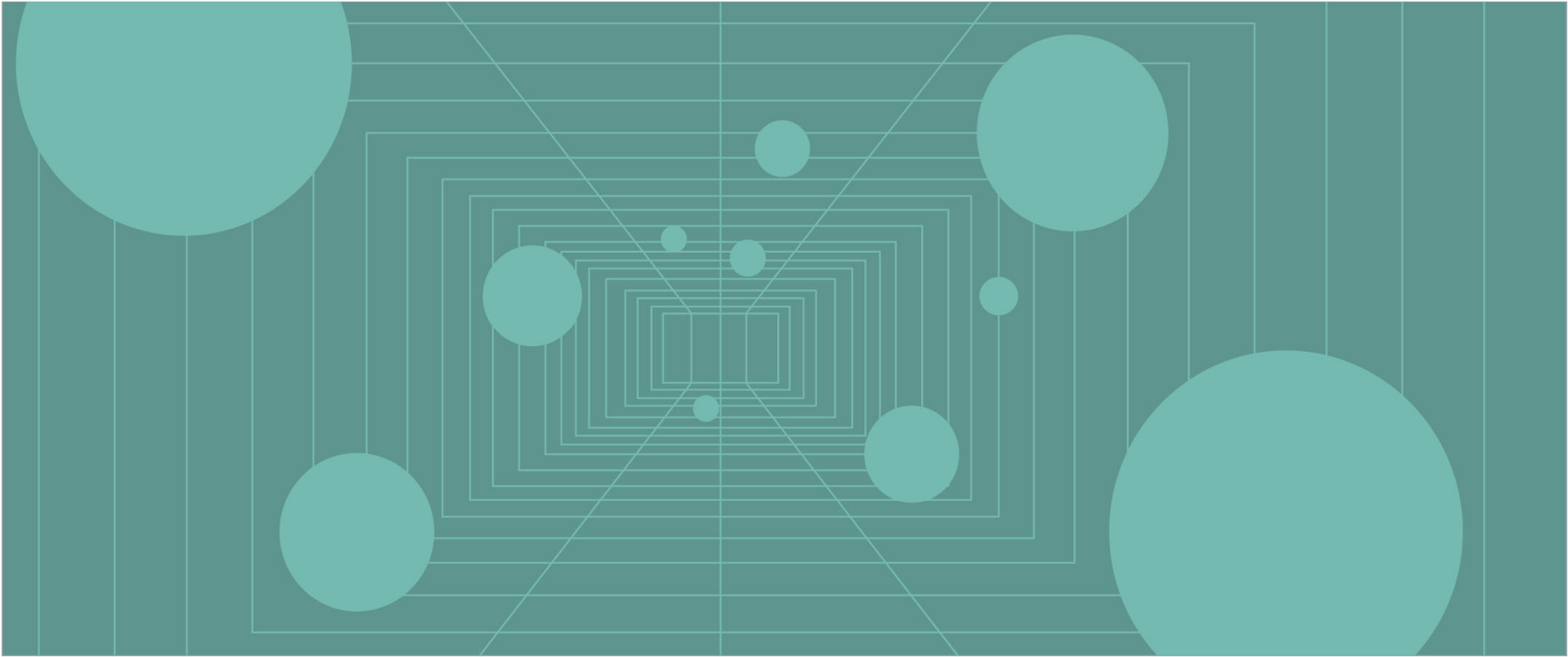


Table of Contents

Introduction to Operating Metrics	4
Notes on the Data	5
Global Private Equity Analysis	
Key Valuation Metric: EBITDA Purchase Price Multiple	
Total Universe	7
By Company Type	9
By Enterprise Value Segment	10
By Sector	11
Key Capital Structure Metric: Leverage Multiple	
Total Universe	13
By Company Type	15
By Enterprise Value Segment	16
By Sector	17
Key Performance Metric: Revenue Growth	
Total Universe	19
By Company Type	21
By Enterprise Value Segment	22
By Sector	23
Key Performance Metric: EBITDA Growth	
Total Universe	25
By Company Type	27
By Enterprise Value Segment	28
By Sector	29
Key Performance Metric: EBITDA Margin	
Total Universe	31
By Company Type	33
By Enterprise Value Segment	34
By Sector	35
Key Exit Metrics	
Purchase Price Multiple Expansion and Leverage Compression	37–39
Revenue CAGR, EBITDA CAGR, and Margin Expansion	40–41

Table of Contents (cont)

Key Valuation Metric: Revenue Purchase Price Multiple	
Total Universe	43
By Company Type	44–45
Regional Comparisons: Asia, Europe, and the United States	
Breakdown of Investment Strategies by Region	47
Purchase Price Multiple	48
Leverage Multiple	49
Revenue Growth	50
EBITDA Growth	51
EBITDA Margin	52
European Private Equity Analysis	
Key Valuation Metric: Purchase Price Multiple	
Total Universe	55
Buyout Universe	56
By Enterprise Value Segment	57
Key Capital Structure Metric: Leverage Multiple	
Total Universe	59
Buyout Universe	60
By Enterprise Value Segment	61
Key Performance Metric: Revenue Growth	
Total Universe	63
Buyout and Growth Equity Universes	64
By Enterprise Value Segment	65
Key Performance Metric: EBITDA Growth	
Total Universe	68
Buyout and Growth Equity Universes	70
By Enterprise Value Segment	71
Key Performance Metric: EBITDA Margin	
Total Universe	73
Buyout and Growth Equity Universes	75
By Enterprise Value Segment	76

Table of Contents (cont)

European Private Equity Analysis (cont)

Key Exit Metrics

Purchase Price Multiple Expansion and Leverage Compression

78

Revenue CAGR, EBITDA CAGR, and Margin Expansion

79–82

Asian Private Equity Analysis

Purchase Price Multiples

84

Leverage Multiples

86

Revenue Growth: Total Universe

88

Revenue Growth: By Enterprise Value Segment

90

EBITDA Growth: Total Universe

91

EBITDA Growth: By Enterprise Value Segment

93

EBITDA Margin: Total Universe

94

EBITDA Margin: By Enterprise Value Segment

96

Introduction to Operating Metrics

- The data in this report on operating metrics provide insights into key parts of the process by which private equity (PE) managers execute their strategy:
 - Purchasing the company and optimizing the capital structure
 - Improving the performance of the company and transforming the business
- PE managers aim to purchase companies at attractive prices, optimize their capital structures, and then—with operational improvements, revenue growth, and/or other acquisitions—seek to sell the company at a higher price.
- Similar metrics can be used to evaluate both private and public companies, though public market analysts typically focus on company earnings and price-earnings ratios rather than EBITDA (earnings before interest, tax, depreciation, and amortization) and use EBITDA multiples as their proxy for cash flow.
- Cambridge Associates has captured and analyzed current and historical data from global PE funds since the year ended December 31, 2011. This year's report includes data through the period ended December 31, 2022.
- Our analysis allows for the comparison of private and public companies across industry sectors and company sizes for various parts of the investment process. The data shed light on key levers and value drivers in private equity, as well as the risks and returns of private equity versus public equity.

Notes on the Data

- Cambridge Associates collected information from PE firms of all sizes with broad mandates, as well as specialized and sector-focused strategies. The sample of private investments includes almost 15,000 companies worldwide, of which almost 8,000 are based in the United States, nearly 3,800 in Europe, and 2,100 in Asia; they were acquired by PE firms from 2000 through 2022 and range in enterprise value from less than \$1 million to greater than \$100 billion. The universe of private investments is subject to change over time.
- Within the report, depending on the metric analyzed, the set of companies included will vary. This is due to the acquisition and disposition of companies during the period analyzed. Additionally, this reflects the impact of an interquartile range, a statistical tool used to screen for outliers as part of each calculation. Finally, restatements in company data that sometimes occur may lead to changes in historical metrics.
- Operating metrics data were collected directly from investment managers and have not been independently verified.
- Unless specified, the exhibits include unrealized and realized investments.
- For European and Asian comparisons between the total company universe and public markets, the MSCI All Country Europe and MSCI All Country Asia Pacific indexes were selected based on the market capitalization and country exposures of the underlying stocks.
- Deal type categorizations have been made at the company level and reflect information provided by the PE managers.
- Sector classifications are based on the Global Industry Classification Standard (GICS®). GICS was developed by and is the exclusive property and a service mark of MSCI Inc. and S&P Global Market Intelligence LLC and is licensed for use by Cambridge Associates.
- Individual company operating metrics (e.g., revenue and EBITDA) have not been adjusted for acquisitions.
- The analyzed holding period for some companies represented in the dataset is short; thus, EBITDA growth rates may be muted initially, as PE owners may not seek to maximize EBITDA in the first several years of ownership.
- Any company with a negative metric for EBITDA, net debt, or revenue was excluded from analysis using that metric. Metrics are calculated in local currency.
- Company counts for each analysis reflect all submitted transactions, excluding outliers. We eliminate “duplicate” transactions completed by the same firm across funds in a given year. As a result, there have been changes to metrics previously published. For a “club” or syndicated deal that involves two or more separate firms, there would still be two or more companies in our universe.
- When the operating metrics information is disaggregated into deal types, enterprise values, and sectors, the sample sizes are smaller and may be biased by one or several data points. Time periods with fewer than 15 observations have been marked NA.
- Past results are not an indication of future results, provide no guarantee for the future, and will not be constant over time.

GLOBAL PRIVATE EQUITY ANALYSIS

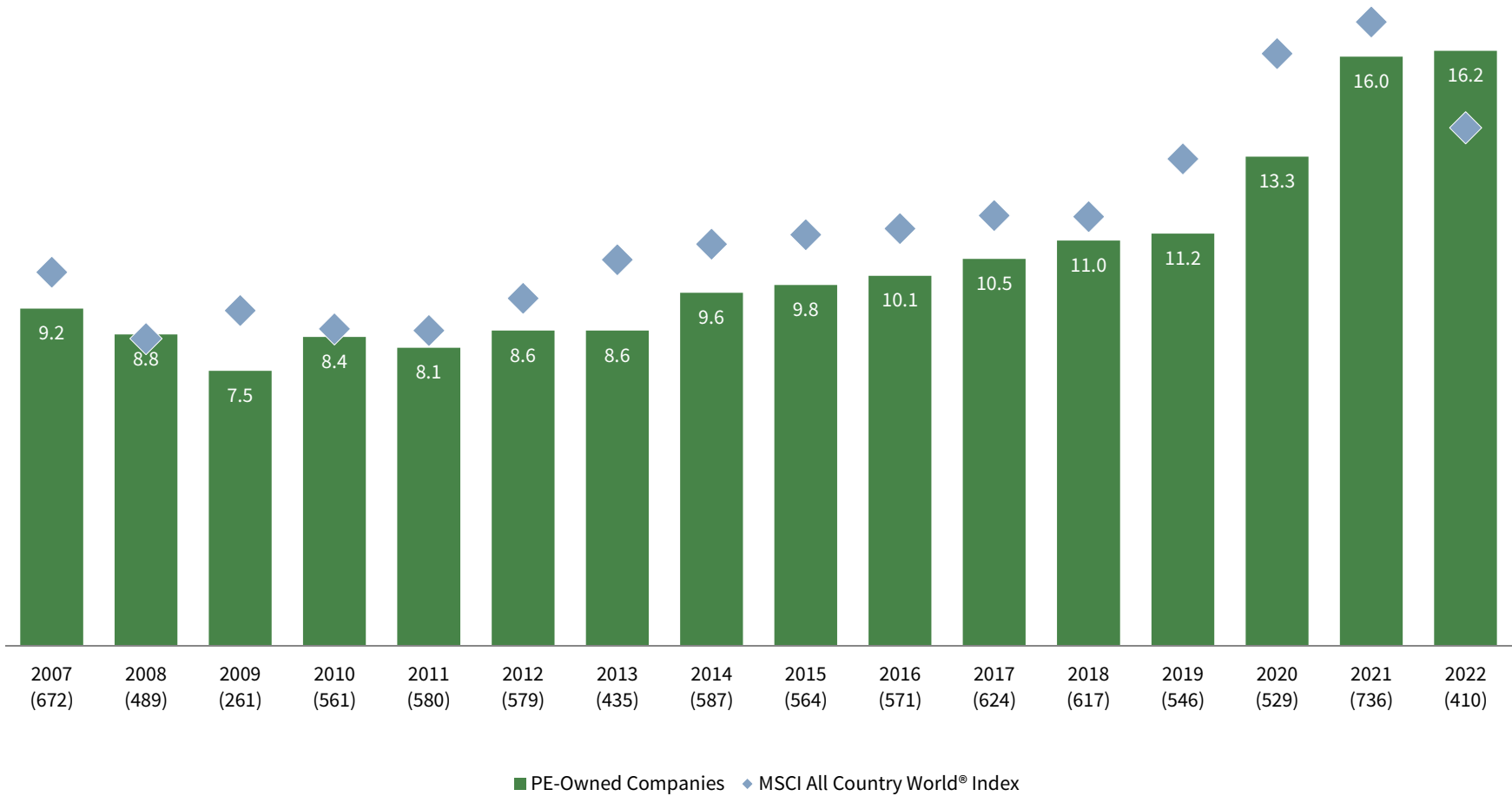
- **EBITDA Purchase Price Multiple**
- Leverage Multiple
- Revenue Growth
- EBITDA Growth
- EBITDA Margin
- Exit Metrics
- Revenue Purchase Price Multiple

Global PE PPMs stayed elevated in 2022

As public markets responded to higher interest rates, 2022 became the first year analyzed when private companies transacted at higher valuations than publics

AVERAGE EBITDA PURCHASE PRICE MULTIPLES AT ACQUISITION OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Enterprise Value/EBITDA

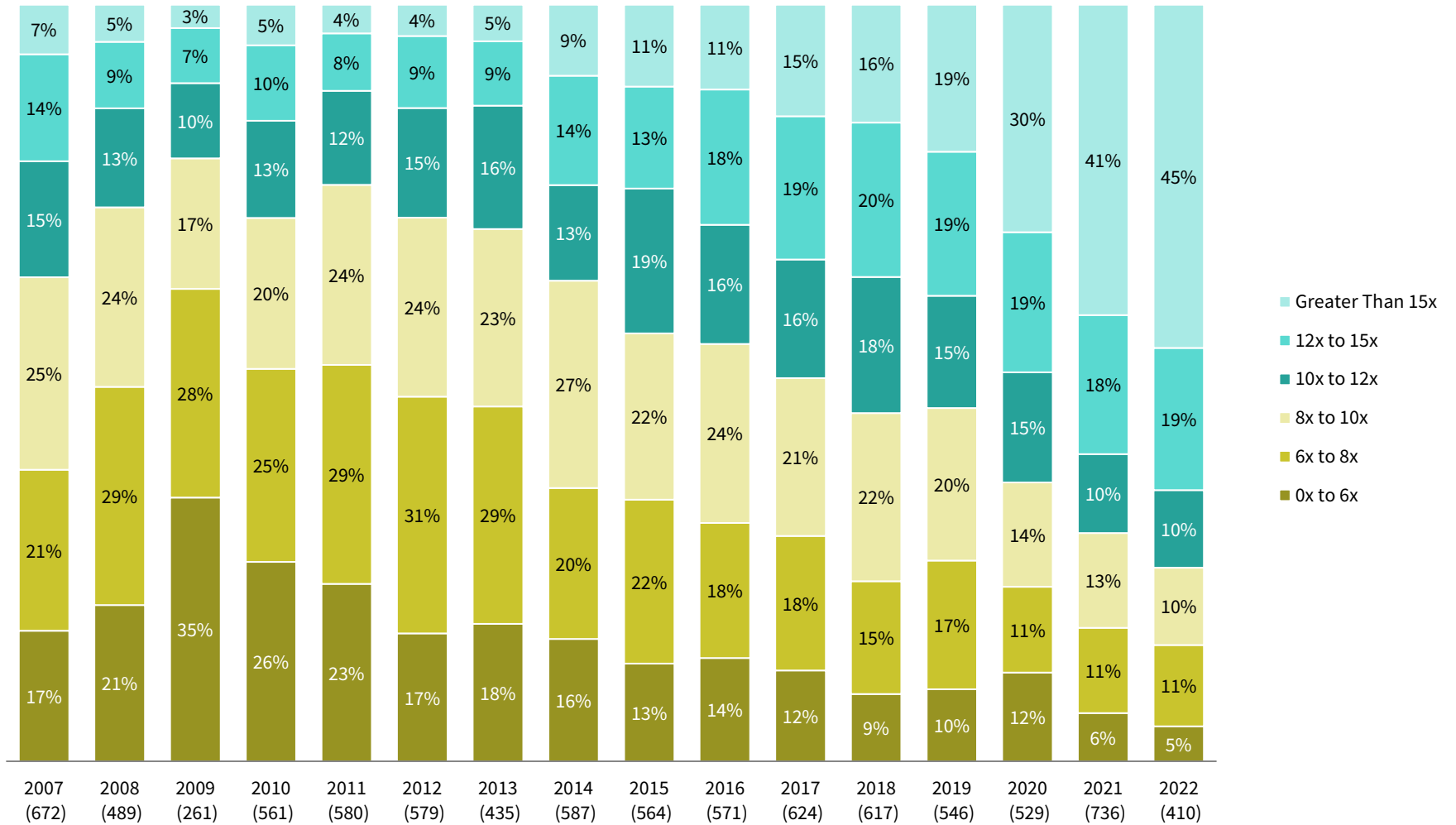


Investment pace slowed but the portion of PE transactions completed at multiples >15x EBITDA continued to grow in 2022

About a quarter of the deals were valued at less than 10X EBITDA

AVERAGE EBITDA PURCHASE PRICE MULTIPLE BREAKDOWN OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Enterprise Value/EBITDA

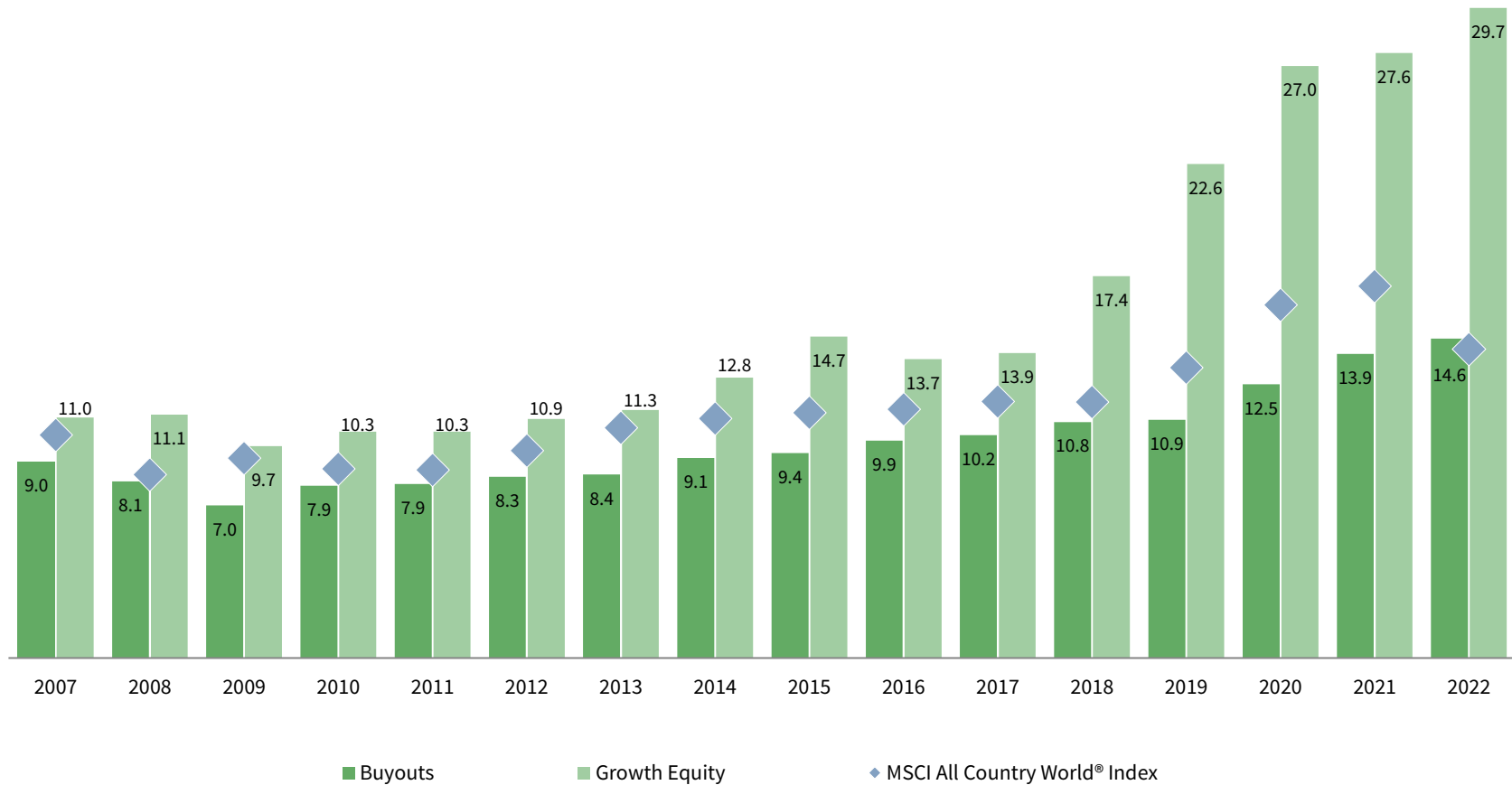


Buyout PPMs have increased every year since 2011

Growth equity acquisition multiples no longer tethered to EBITDA

AVERAGE EBITDA PURCHASE PRICE MULTIPLES AT ACQUISITION OF GLOBAL BUYOUT AND GROWTH EQUITY COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Enterprise Value/EBITDA

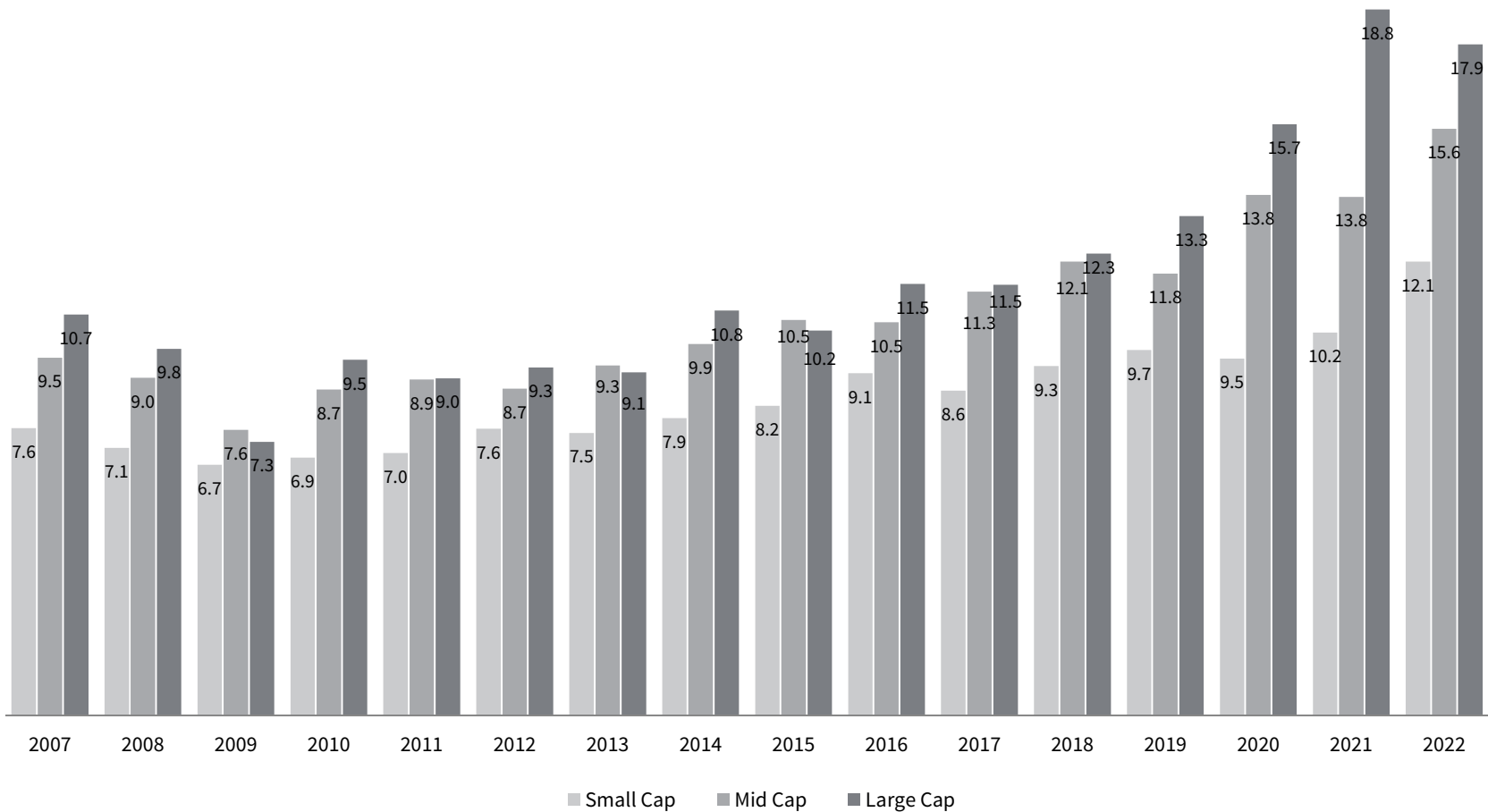


Large buyouts were the only size range where PPMs fell in 2022

As small- and mid-cap PPMs rose by nearly two turns

AVERAGE EBITDA PURCHASE PRICE MULTIPLES AT ACQUISITION OF GLOBAL PRIVATE EQUITY BUYOUT COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • Enterprise Value/EBITDA



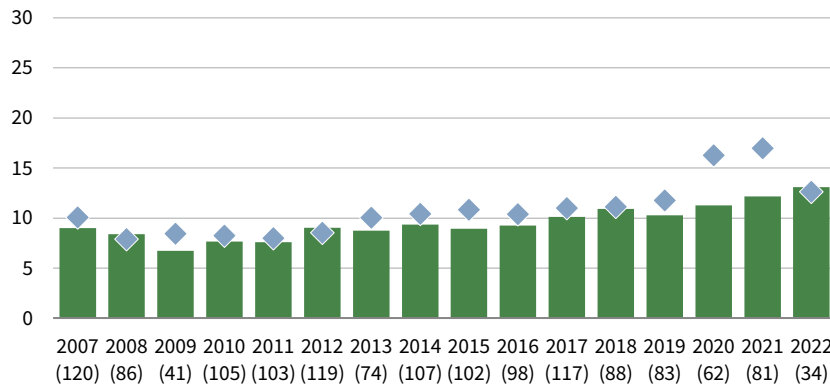
Across sectors, PE discount to publics all but disappeared in 2022

IT was the only sector where PPMs fell in both private and public universes in 2022

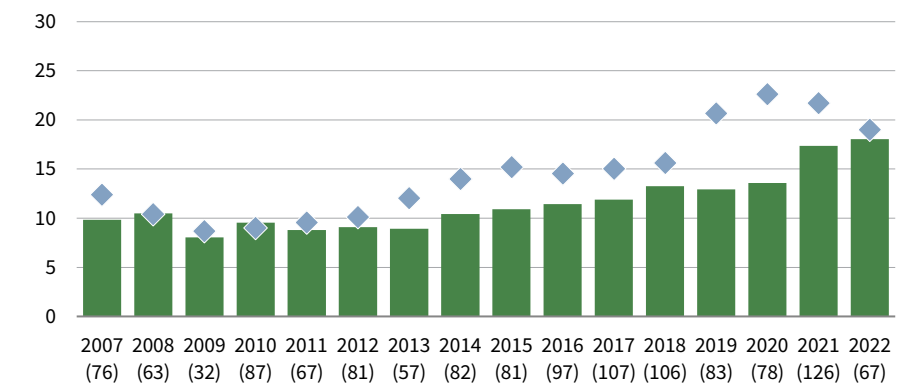
AVERAGE EBITDA PURCHASE PRICE MULTIPLES AT ACQUISITION OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES BY SECTOR

As of December 31, 2022 • Enterprise Value/EBITDA

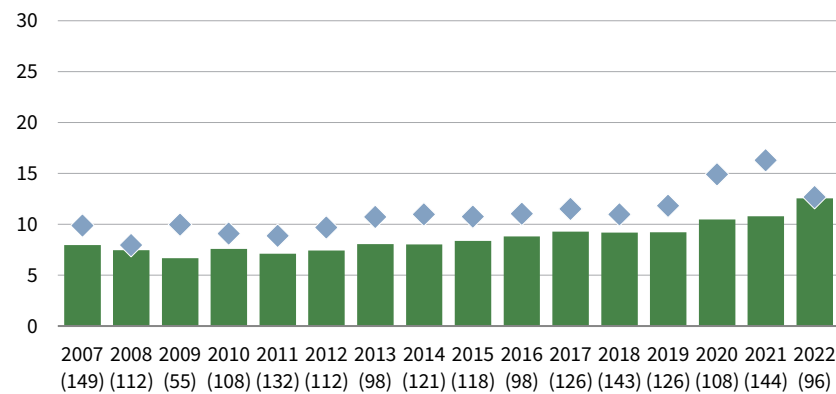
Consumer Discretionary



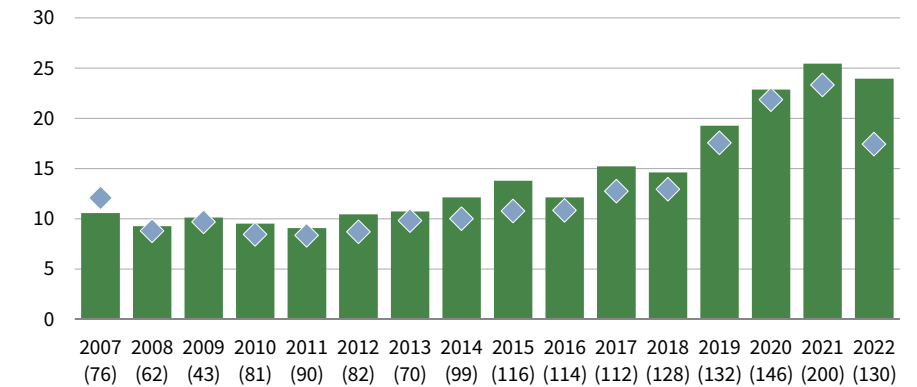
Healthcare



Industrials



Information Technology



■ PE-Owned Companies

◆ MSCI All Country World® Index

GLOBAL PRIVATE EQUITY ANALYSIS

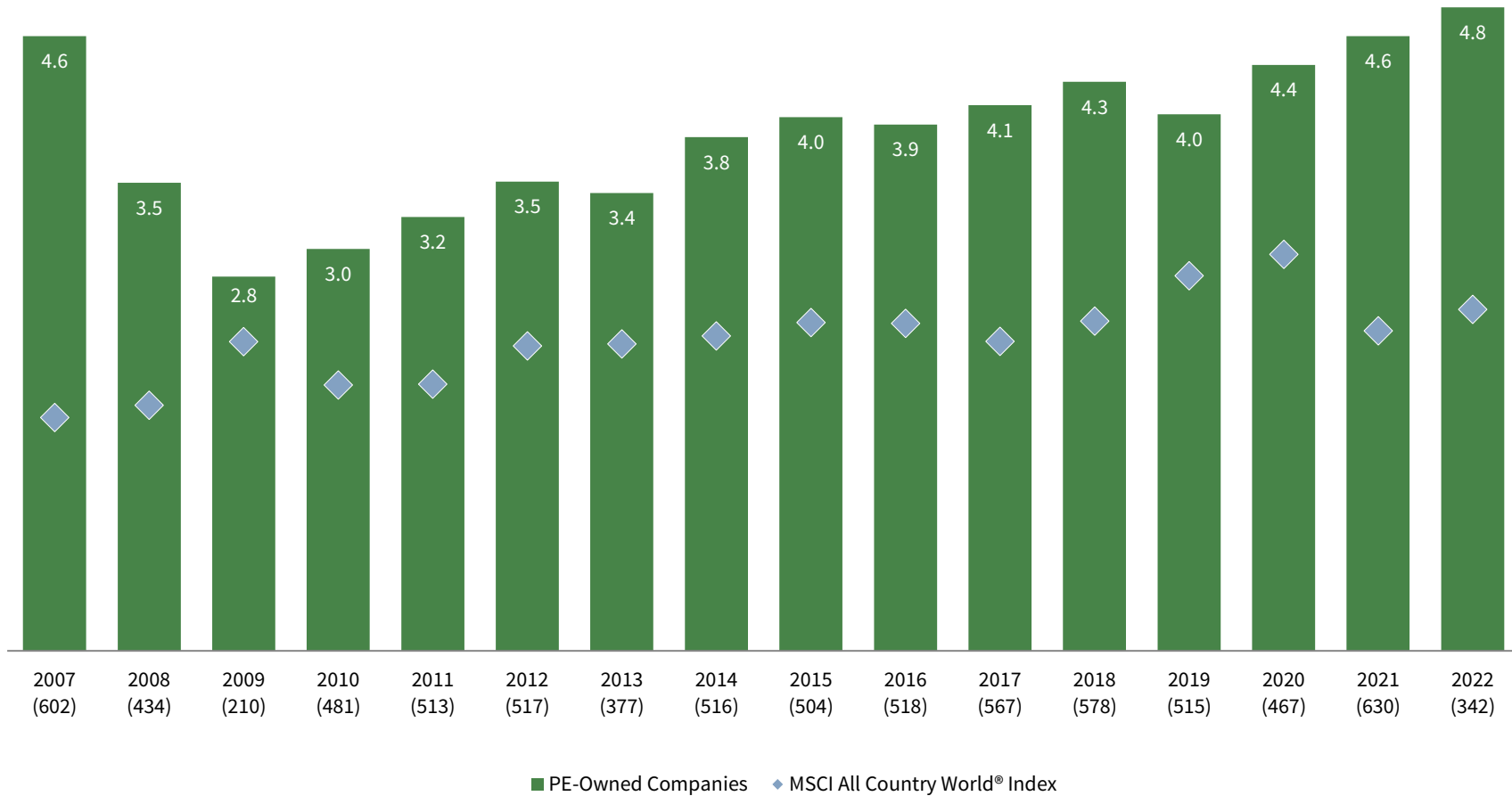
- EBITDA Purchase Price Multiple
- **Leverage Multiple**
- Revenue Growth
- EBITDA Growth
- EBITDA Margin
- Exit Metrics
- Revenue Purchase Price Multiple

Average PE leverage multiples in 2022 eclipsed previous peak in 2007

In 2021–22, the difference between PE and public company leverage multiples hit the highest point (2.2 turns of EBITDA) since 2007–08

AVERAGE EBITDA LEVERAGE MULTIPLES AT ACQUISITION OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Net Debt/EBITDA

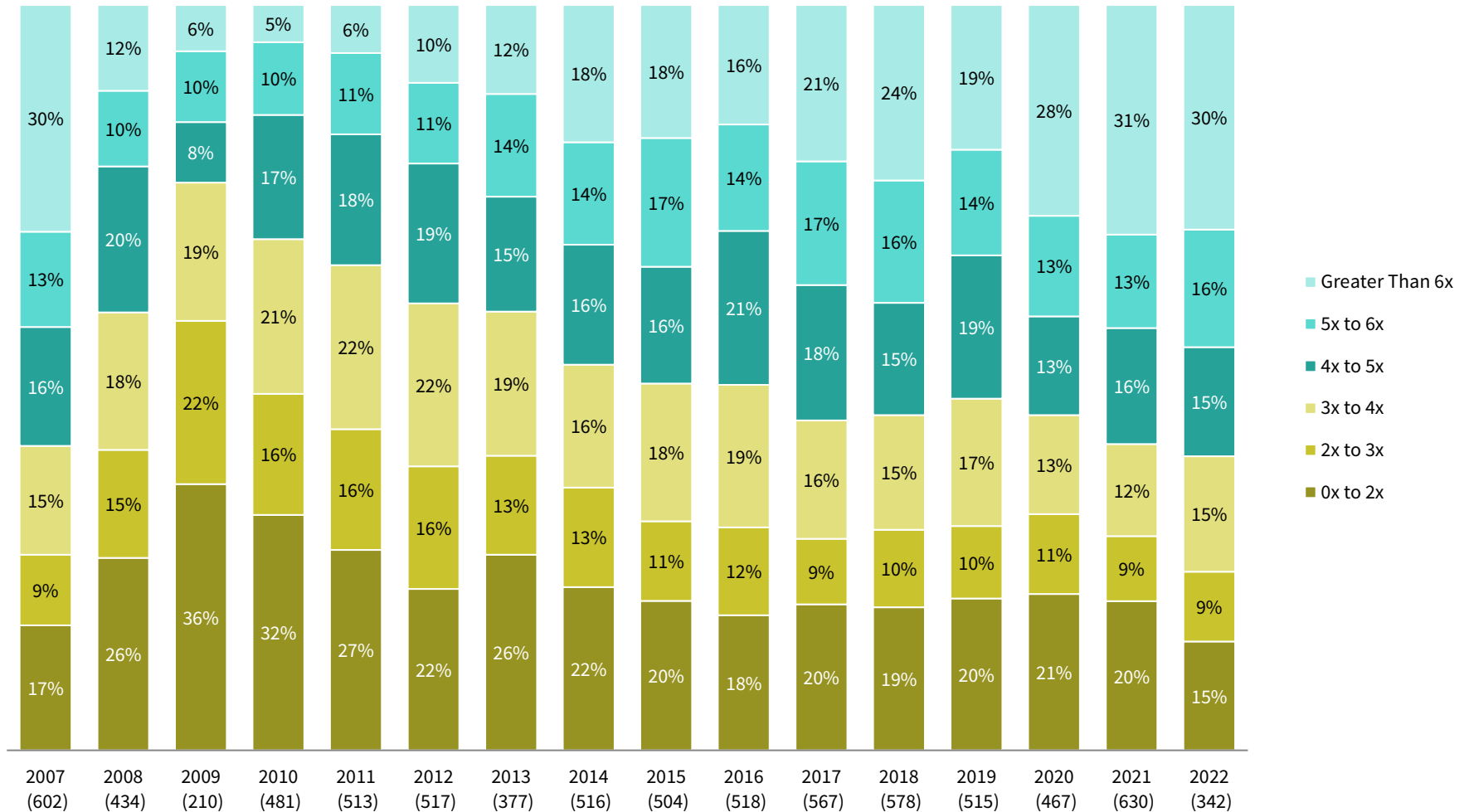


More than 40% of PE deals closed in 2020–22 were levered at 5x EBITDA or higher

During the past two years, the percentage of transactions levered at greater than 6x EBITDA equaled that of 2007

AVERAGE LEVERAGE MULTIPLE BREAKDOWN OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Net Debt/EBITDA

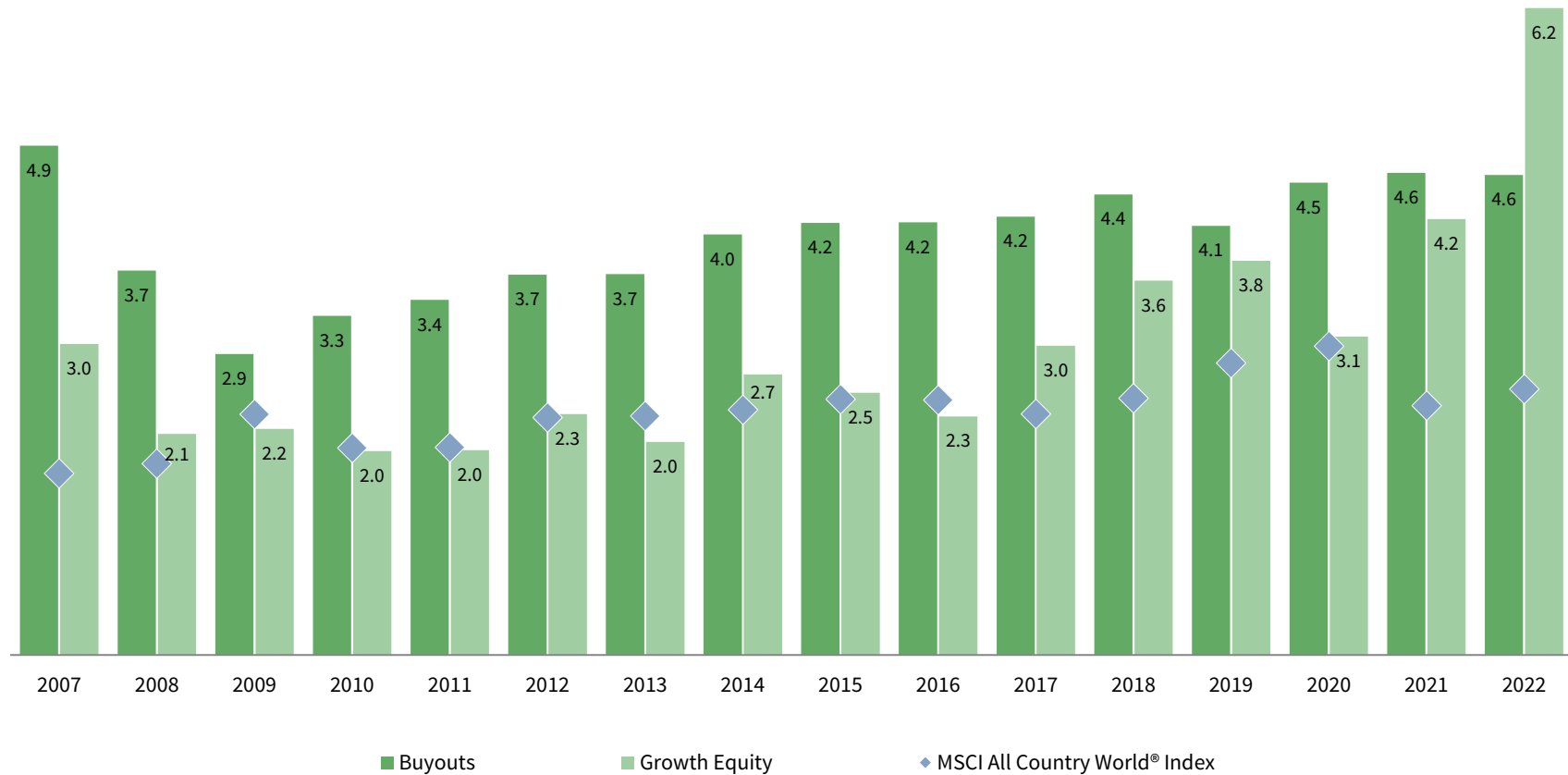


Buyout leverage multiples have been stable over the past three years, trailing its 2007 peak

Like PPMs, growth equity leverage multiples have been tied to revenue, not EBITDA

AVERAGE EBITDA LEVERAGE MULTIPLES AT ACQUISITION OF GLOBAL BUYOUT AND GROWTH EQUITY COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Net Debt/EBITDA

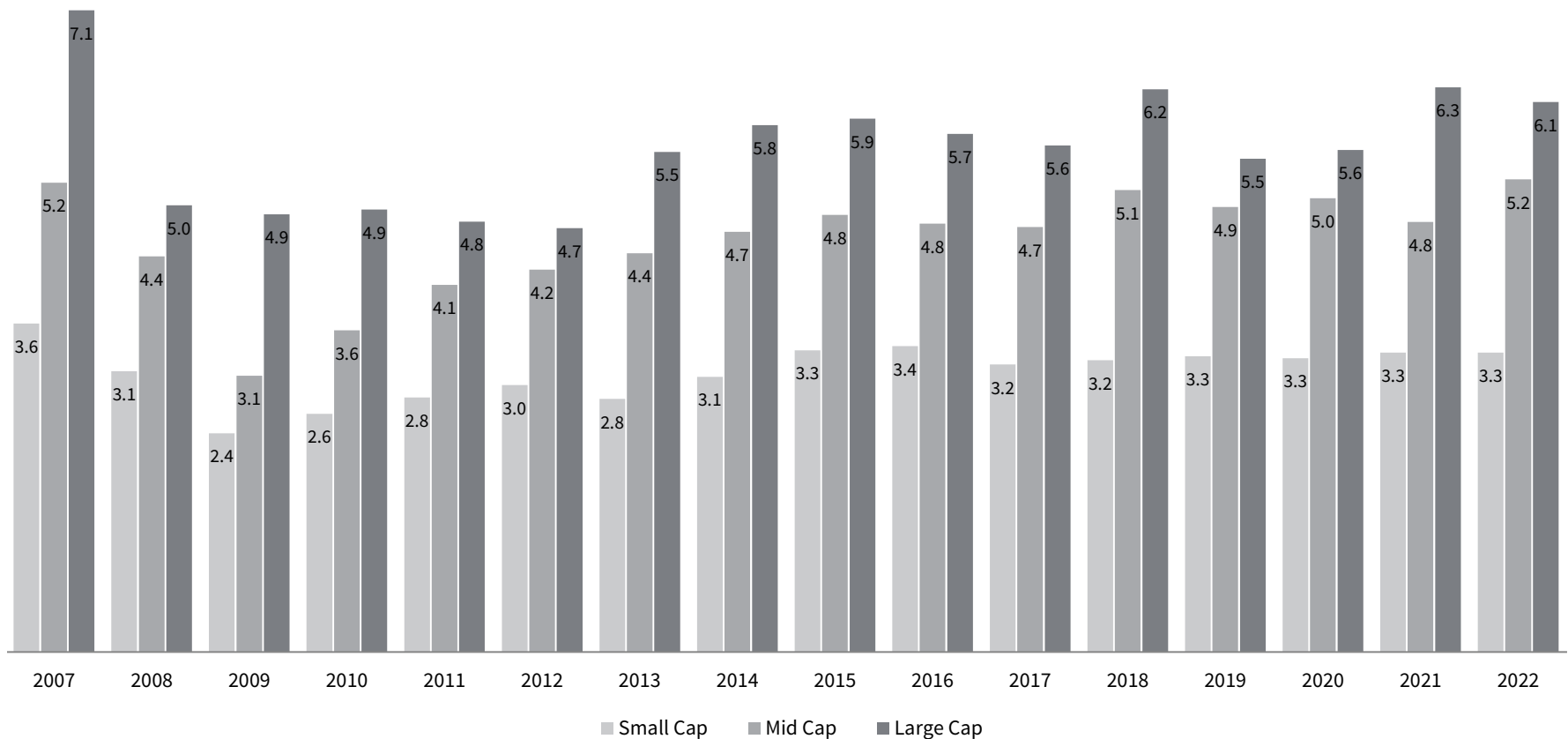


Small buyout leverage multiples have consistently averaged ~3.3x since 2015

Mid-cap multiples were the only ones to rise in 2022

AVERAGE EBITDA LEVERAGE MULTIPLES AT ACQUISITION OF GLOBAL PRIVATE EQUITY BUYOUT COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • Net Debt/EBITDA



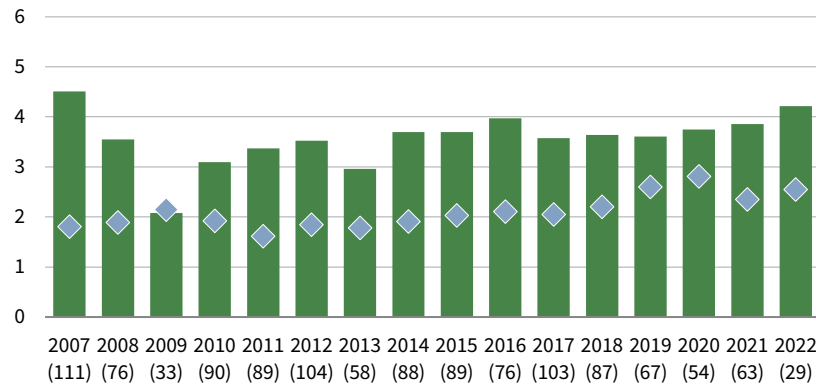
Leverage multiples for PE-backed IT companies were the only ones to decline in 2022

Across sectors, differences in leverage multiples between private and public companies were most pronounced in IT and healthcare

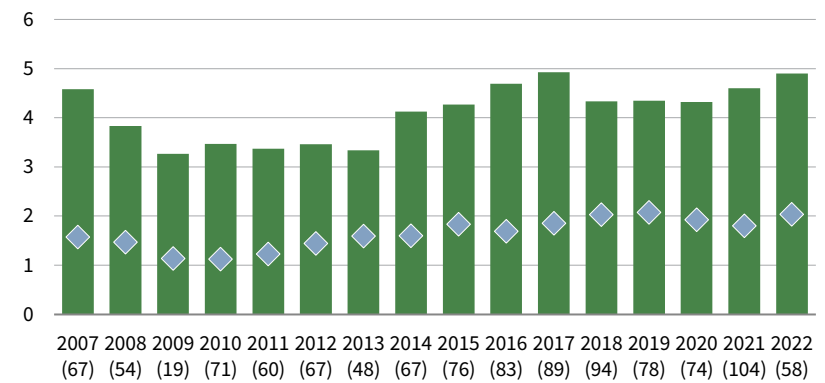
AVERAGE EBITDA LEVERAGE MULTIPLES AT ACQUISITION OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES BY SECTOR

As of December 31, 2022 • Net Debt/EBITDA

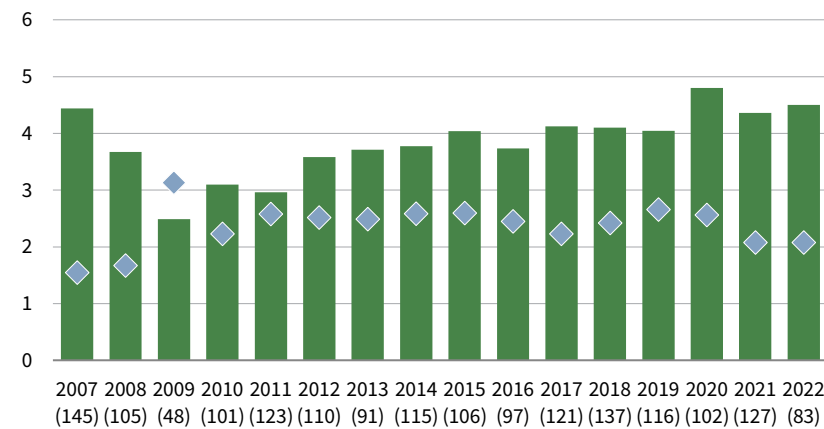
Consumer Discretionary



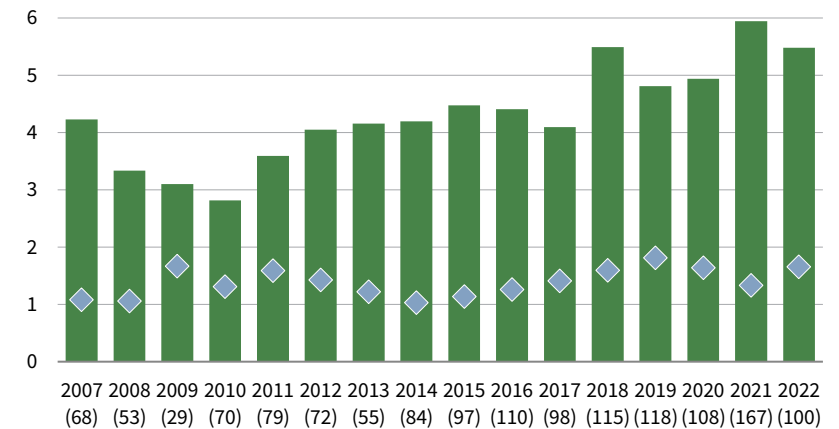
Healthcare



Industrials



Information Technology



■ PE-Owned Companies

◆ MSCI All Country World® Index

GLOBAL PRIVATE EQUITY ANALYSIS

- EBITDA Purchase Price Multiple
- Leverage Multiple
- **Revenue Growth**
- EBITDA Growth
- EBITDA Margin
- Exit Metrics
- Revenue Purchase Price Multiple

Over the last two years, PE company revenue growth averaged 25%, outpacing publics by 10%

From 2010–20, PE annual revenue growth averaged almost 11% compared to 5% for the public market

AVERAGE ANNUAL REVENUE GROWTH OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

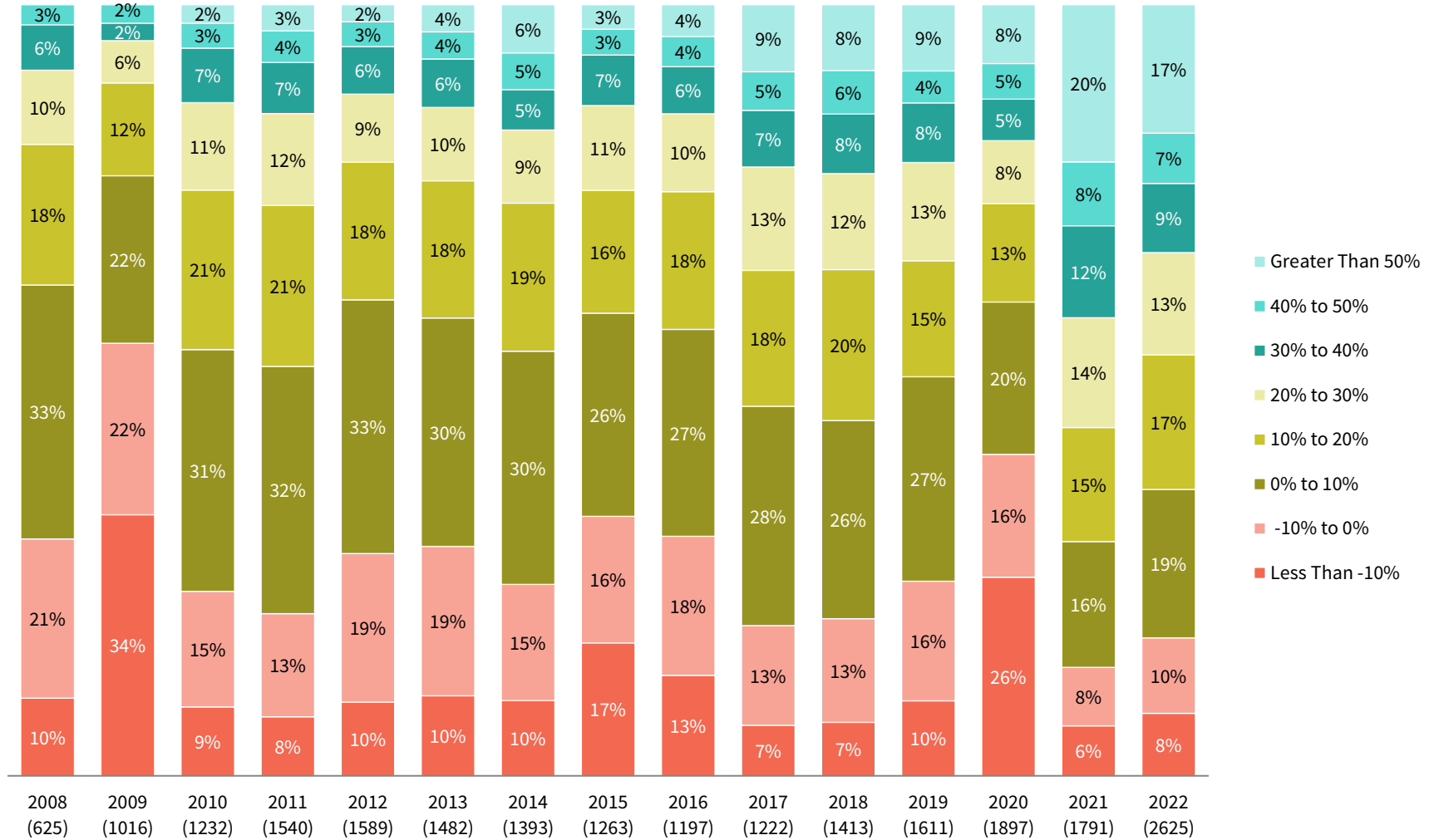


In 2021 and 2022, more than one-third of companies grew annual revenue by at least 30%

From 2008–20, only 15% did

AVERAGE ANNUAL REVENUE GROWTH BREAKDOWN OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

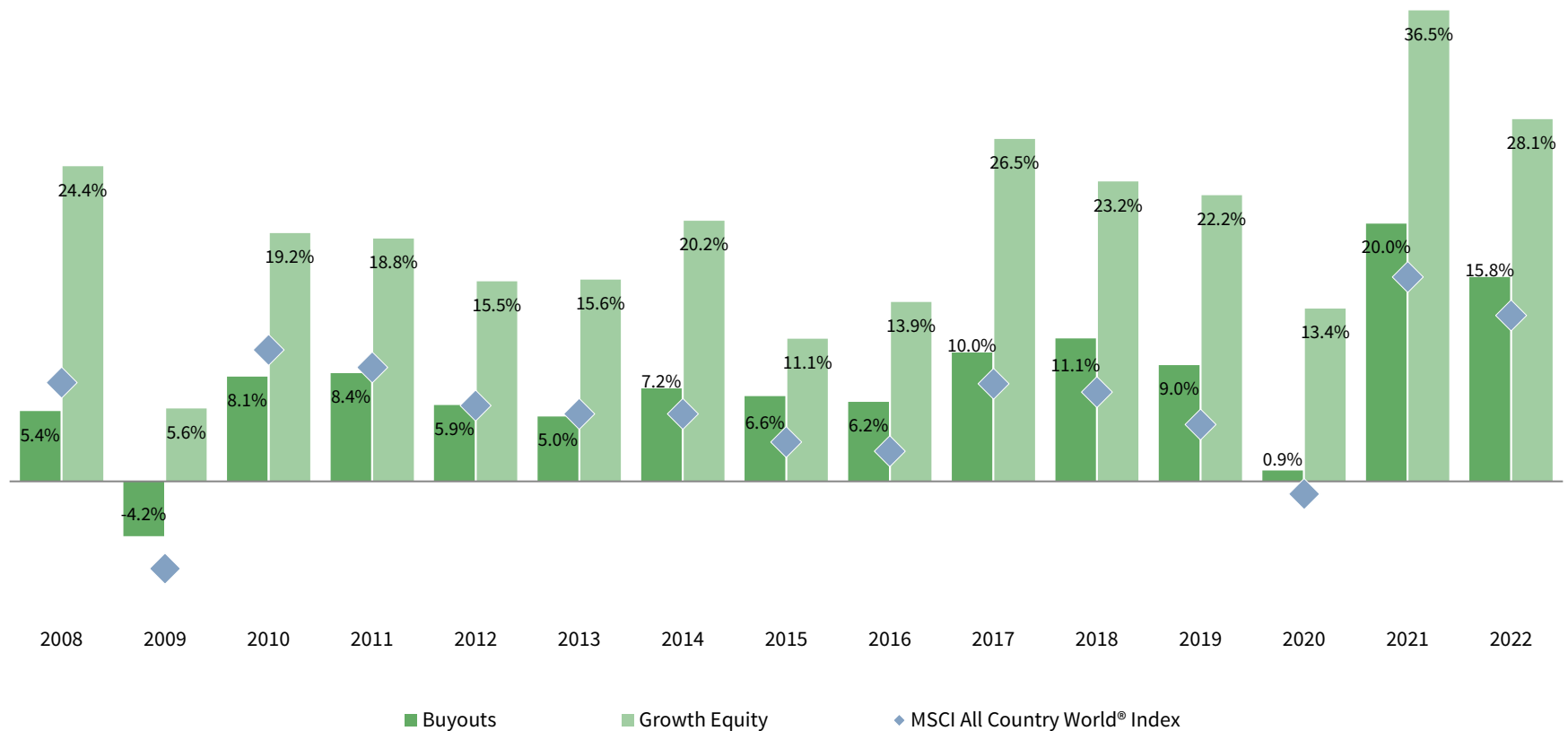


Revenue growth remained strong for PE-backed and public companies in 2022

In seven of the 15 years, growth equity averaged >20% growth; in all years, buyouts averaged higher revenue growth than public peers

AVERAGE ANNUAL REVENUE GROWTH OF GLOBAL BUYOUT AND GROWTH EQUITY COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

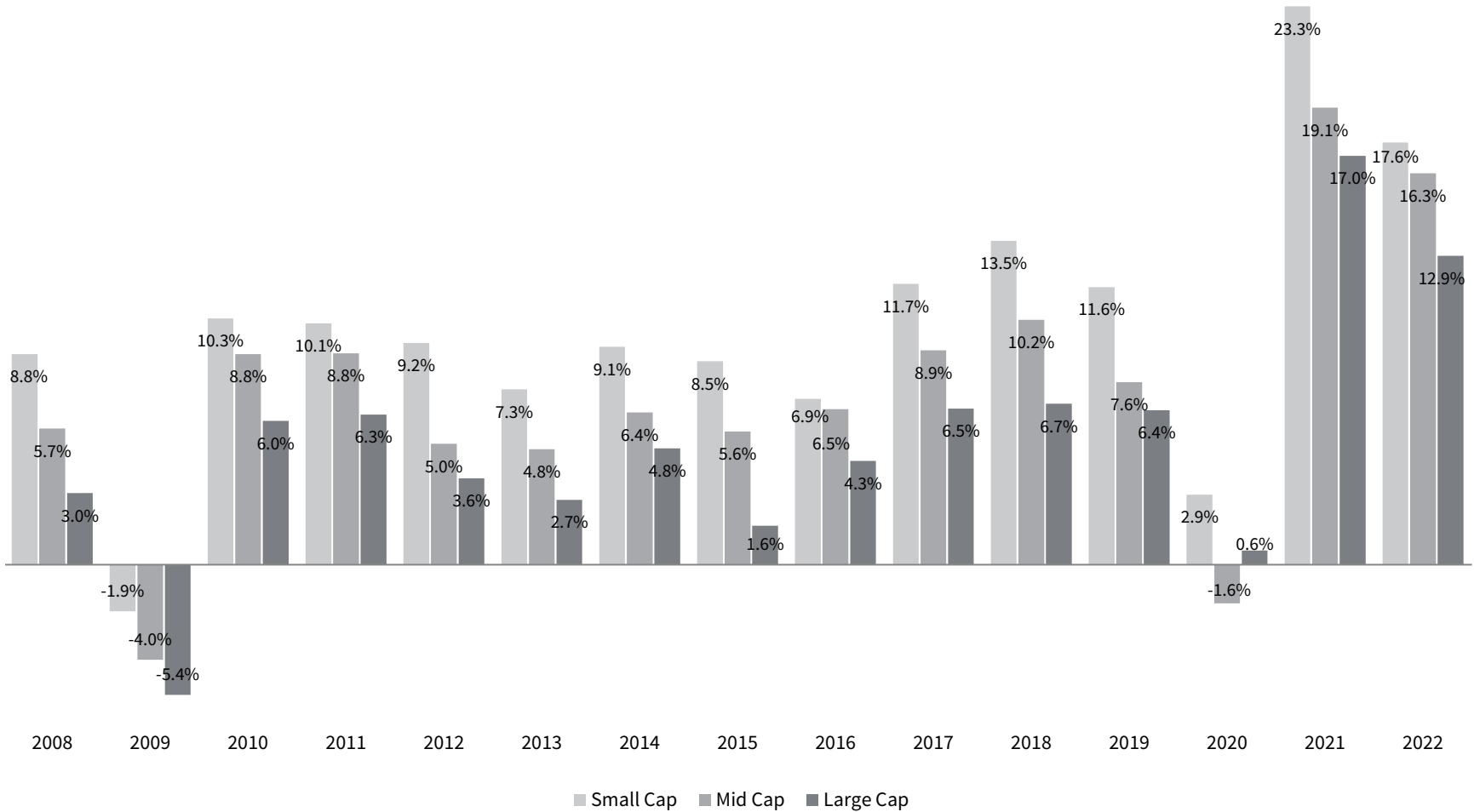


Over the last 15 years, small buyouts averaged 10% annual revenue growth, double the average for large buyouts

All size segments averaged double-digit growth in 2021 and 2022

AVERAGE ANNUAL REVENUE GROWTH OF GLOBAL PRIVATE EQUITY BUYOUT COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • Annual Growth Rate (%)



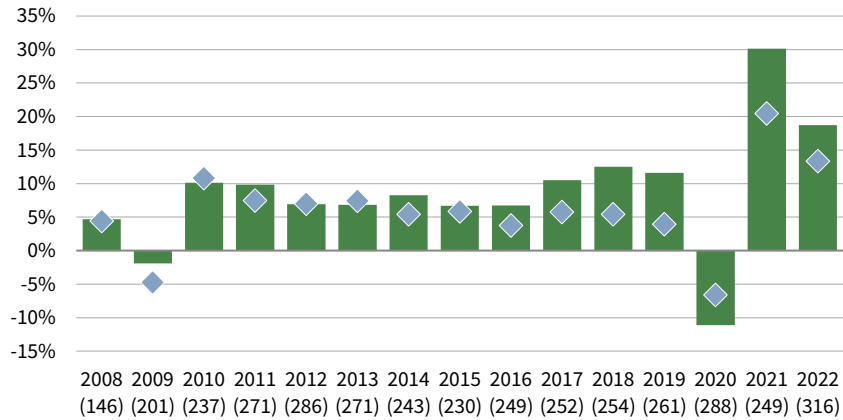
Sectors most able to pass on costs fared best in the higher inflationary environment

PE-backed businesses have averaged higher revenue growth than public peers in all sectors

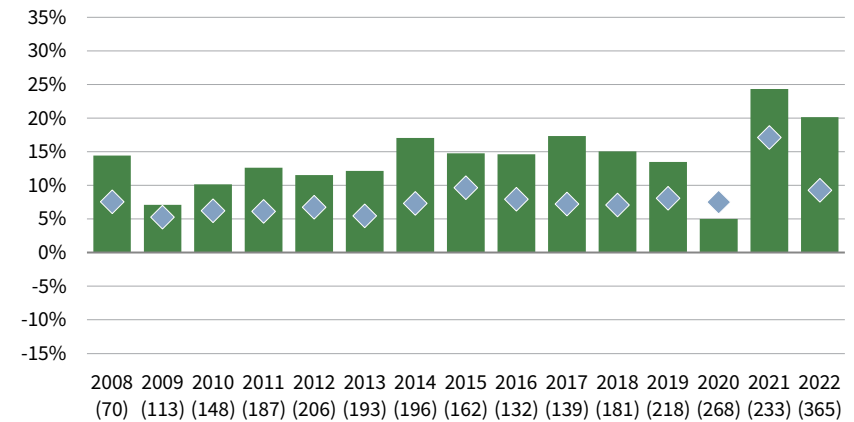
AVERAGE ANNUAL REVENUE GROWTH OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES BY SECTOR

As of December 31, 2022 • Annual Growth Rate (%)

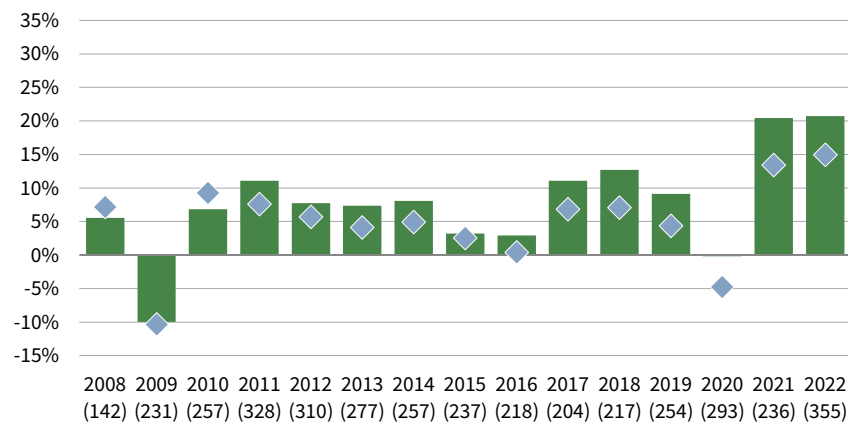
Consumer Discretionary



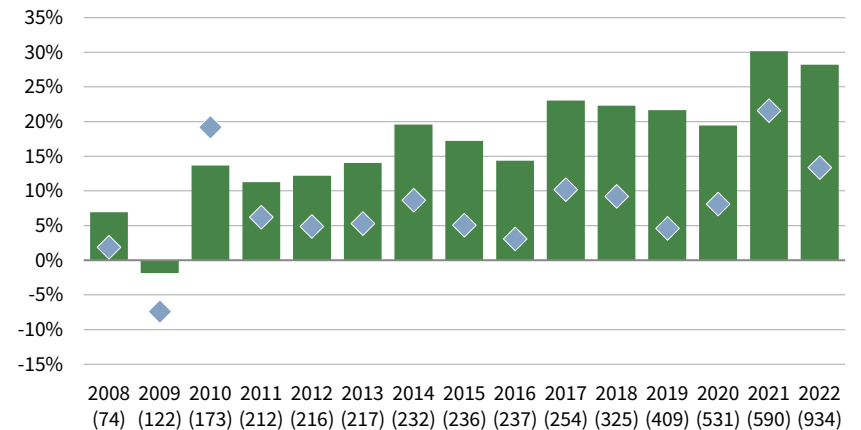
Healthcare



Industrials



Information Technology



■ PE-Owned Companies

◆ MSCI All Country World® Index

GLOBAL PRIVATE EQUITY ANALYSIS

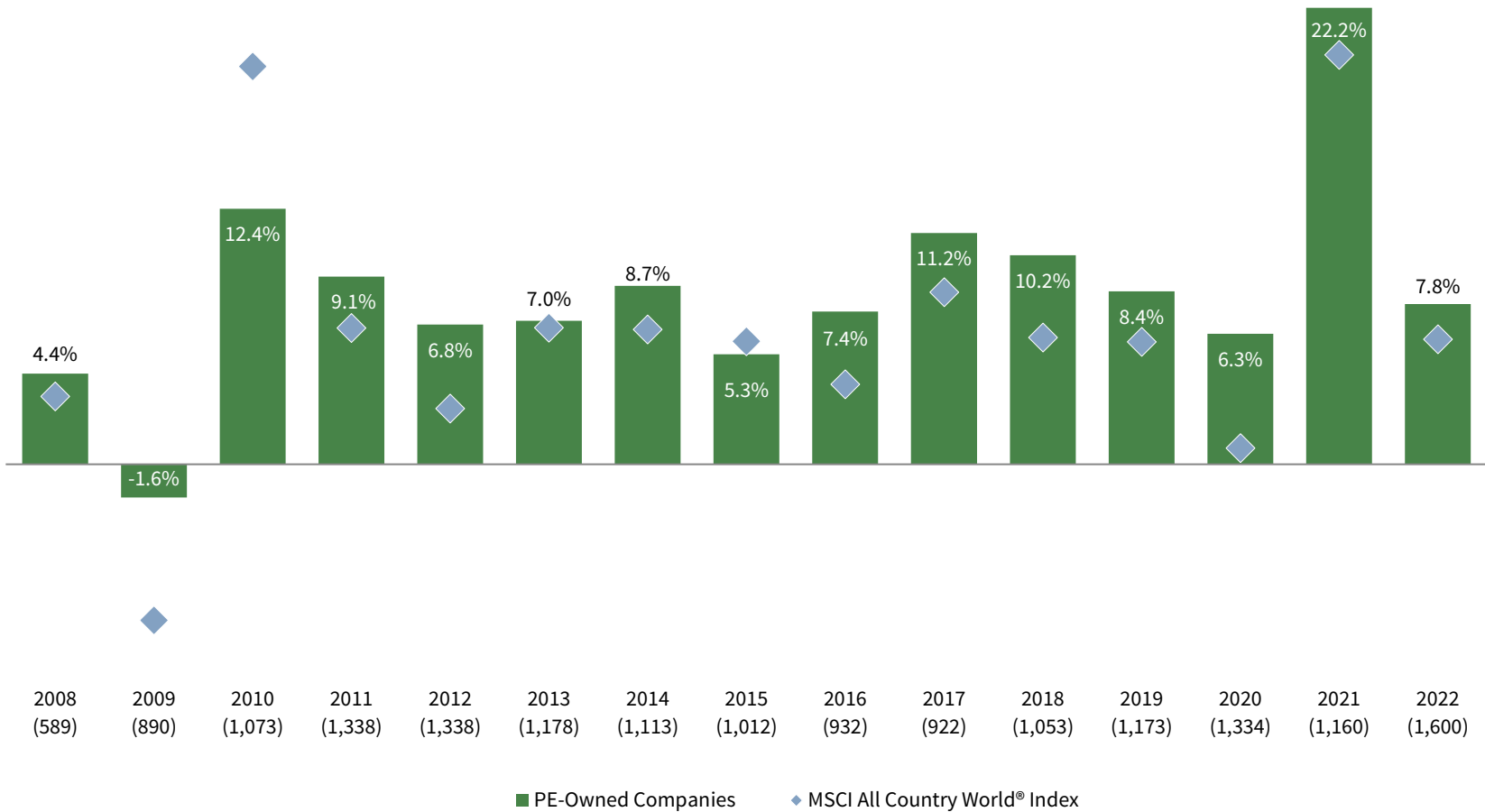
- EBITDA Purchase Price Multiple
- Leverage Multiple
- Revenue Growth
- **EBITDA Growth**
- EBITDA Margin
- Exit Metrics
- Revenue Purchase Price Multiple

After hitting new heights in 2021, PE and public EBITDA growth reverted to long-term means in 2022

Over the 15-year period, PE-backed companies averaged 8.3% annual EBITDA growth, 2% better than their public counterparts

AVERAGE ANNUAL EBITDA GROWTH OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

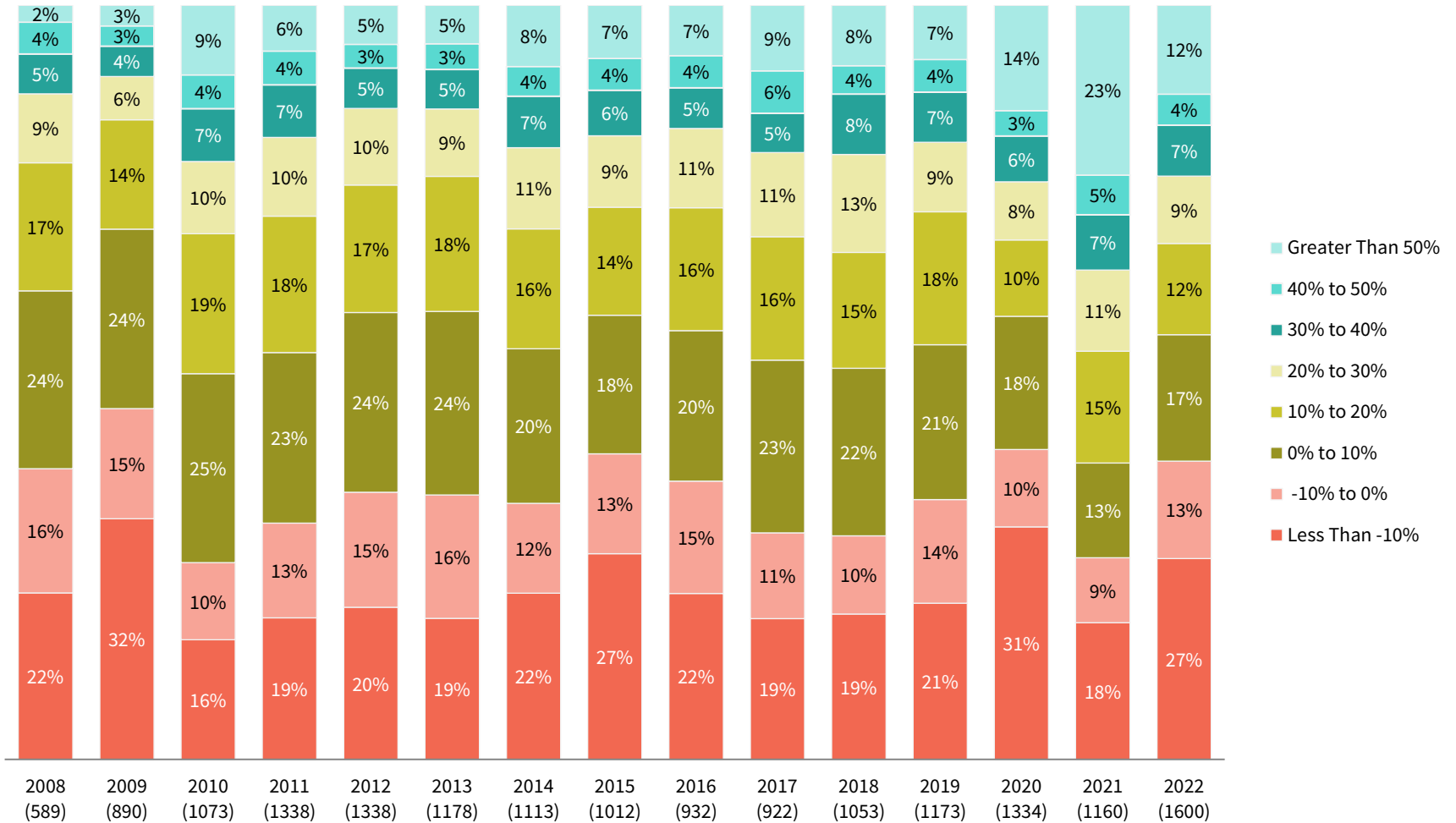


40% of PE companies suffered EBITDA decline in 2022

Amid higher interest rates and inflation, industrial and energy businesses were one-third of the strongest growers

AVERAGE ANNUAL EBITDA GROWTH BREAKDOWN OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

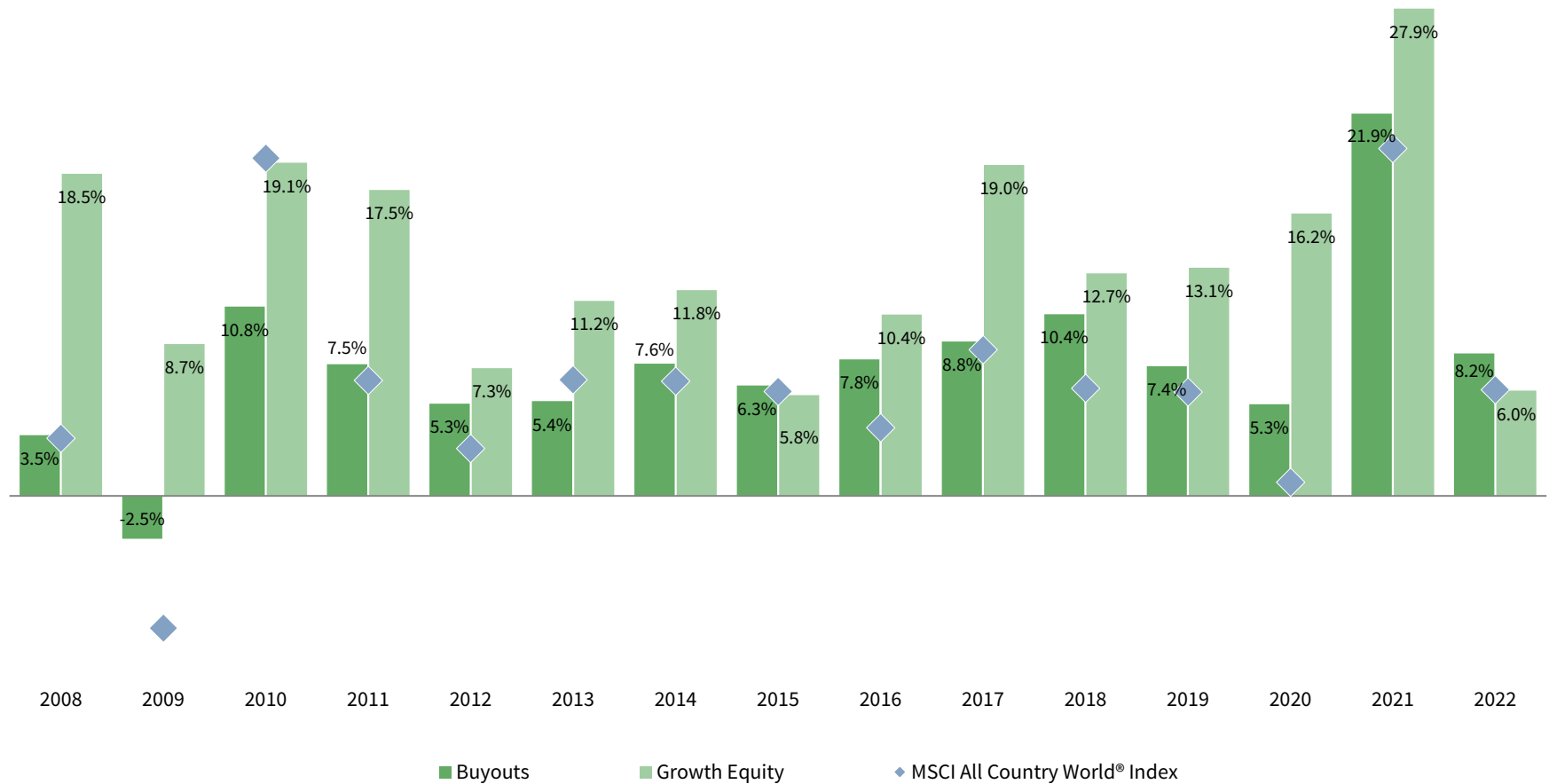


All company types averaged single-digit EBITDA growth in 2022

Over the 15-year period, growth equity averaged nearly 13% annual EBITDA growth, double that of public companies

AVERAGE ANNUAL EBITDA GROWTH OF GLOBAL BUYOUT AND GROWTH EQUITY COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

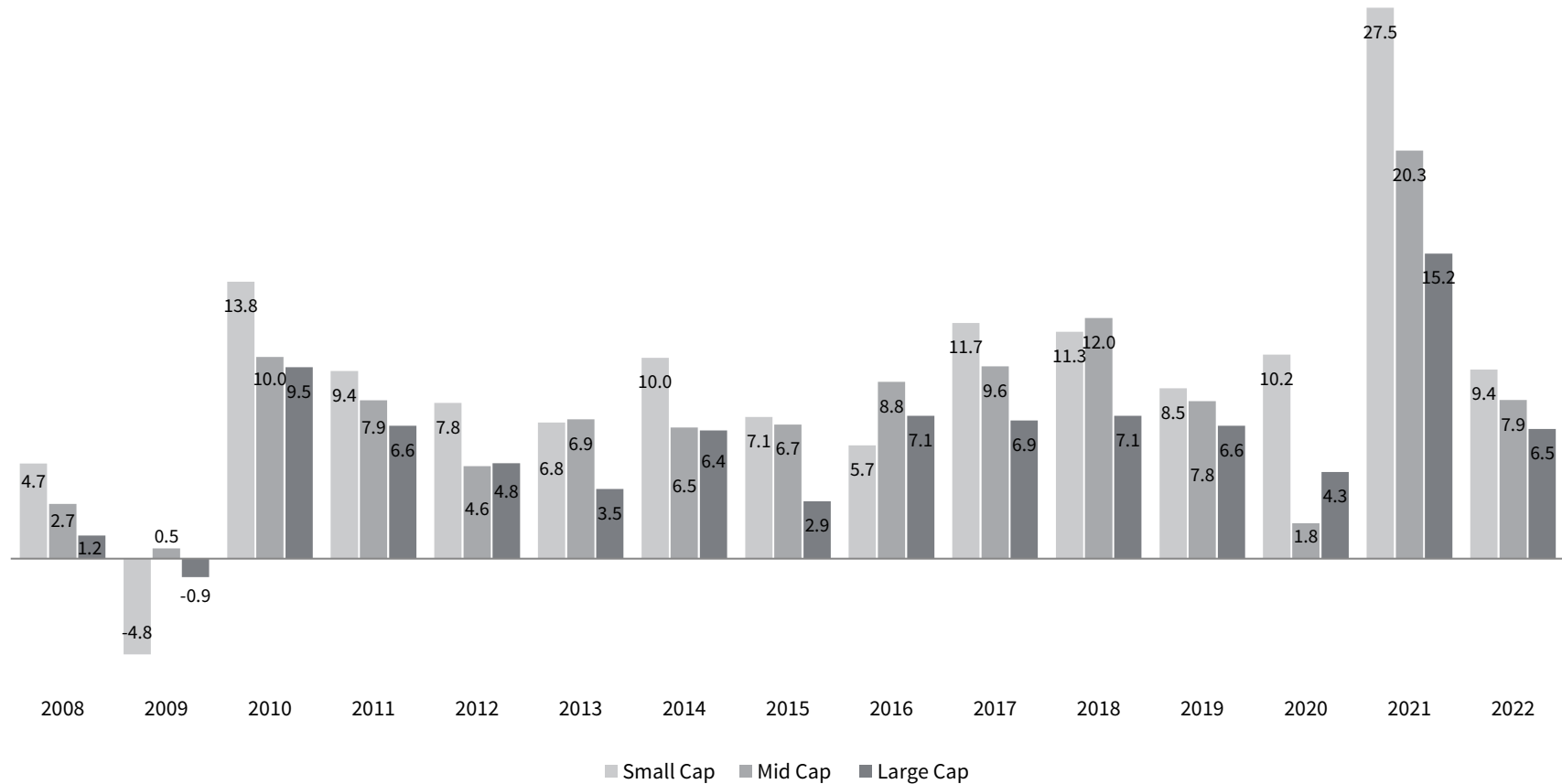


Small buyouts have continued to dominate other size segments in growth

Over the last 15 years, small buyouts averaged 9.2% annual EBITDA growth, compared with 7.4% for mid-cap buyouts and 5.4% for large buyouts

AVERAGE ANNUAL EBITDA GROWTH OF GLOBAL PRIVATE EQUITY BUYOUT COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • Annual Growth Rate (%)



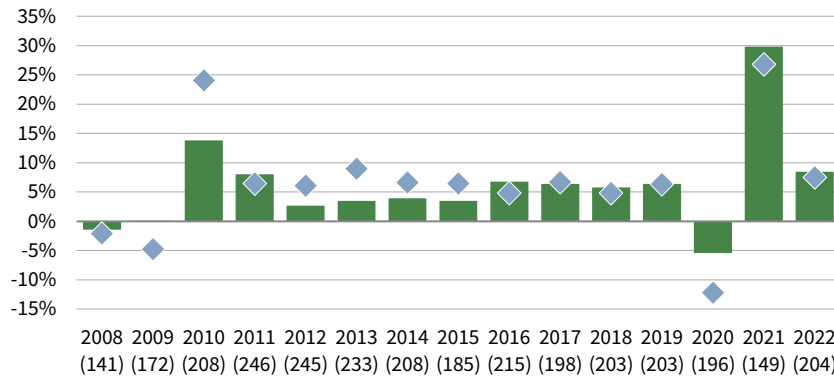
In 2022, “growth” sectors struggled to grow EBITDA

Over the 15-year period, PE-backed healthcare and IT averaged double-digit annual EBITDA growth

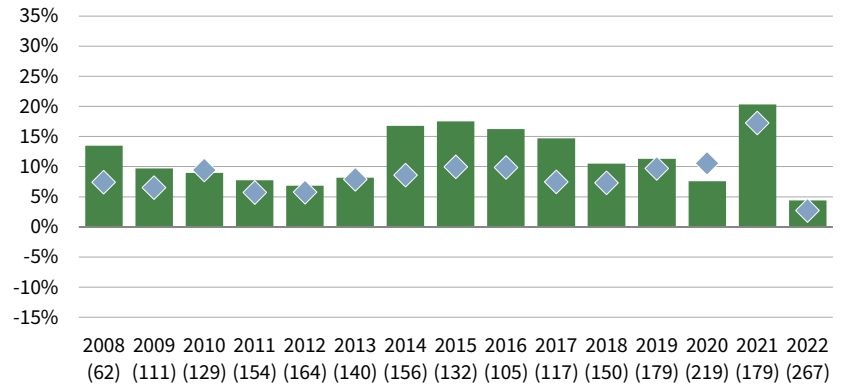
AVERAGE ANNUAL EBITDA GROWTH OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES BY SECTOR

As of December 31, 2022 • Annual Growth Rate (%)

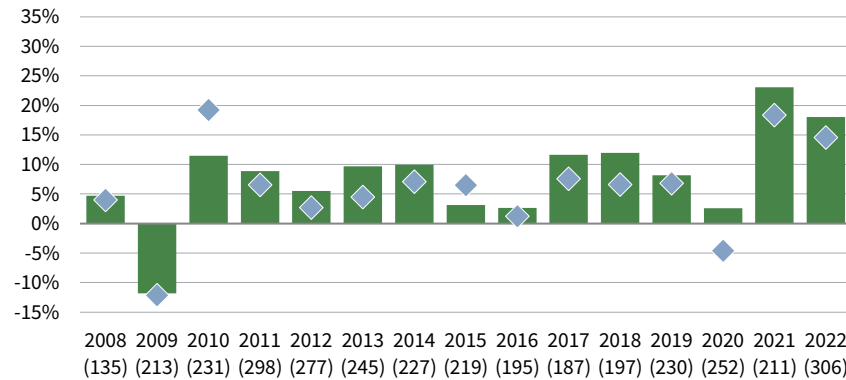
Consumer Discretionary



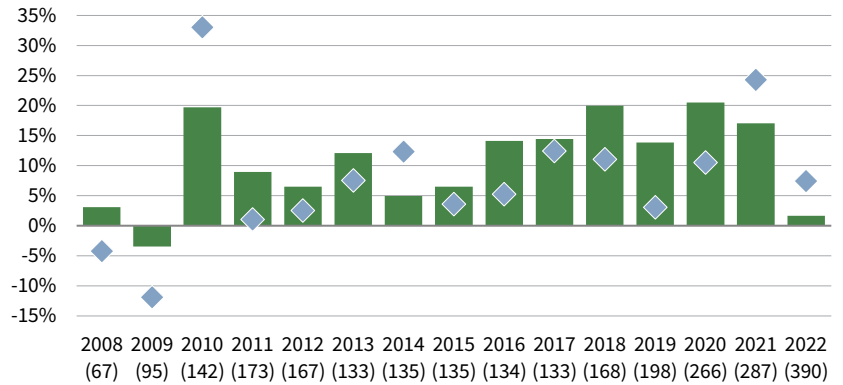
Healthcare



Industrials



Information Technology



■ PE-Owned Companies

◆ MSCI All Country World® Index

GLOBAL PRIVATE EQUITY ANALYSIS

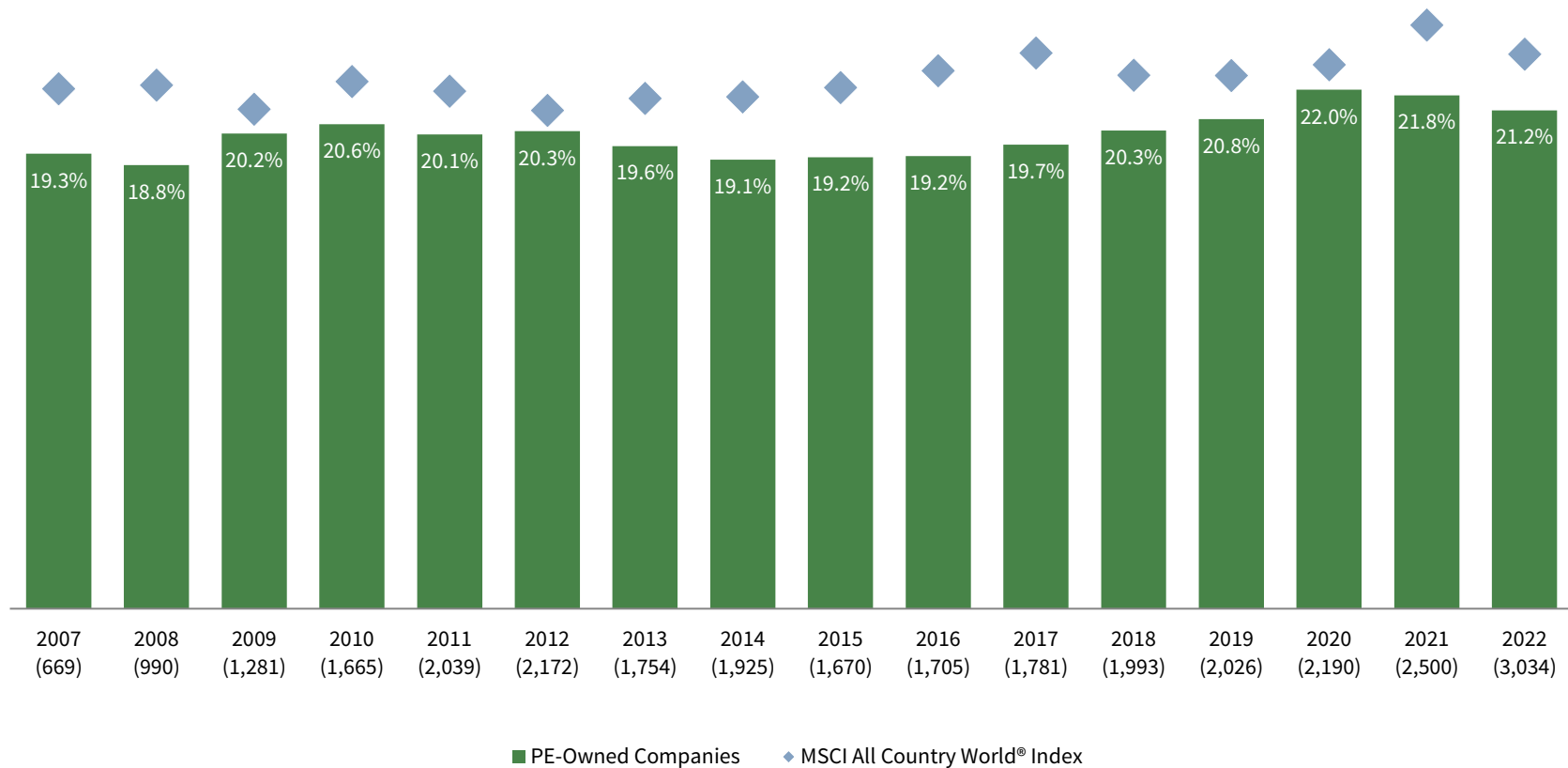
- EBITDA Purchase Price Multiple
- Leverage Multiple
- Revenue Growth
- EBITDA Growth
- **EBITDA Margin**
- Exit Metrics
- Revenue Purchase Price Multiple

PE margins have historically lagged those of public companies in the global public index

Across the full period, PE margins were highest in 2020; public companies operated at highest margins in 2021

AVERAGE ANNUAL EBITDA MARGIN OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • EBITDA/Revenue (%)

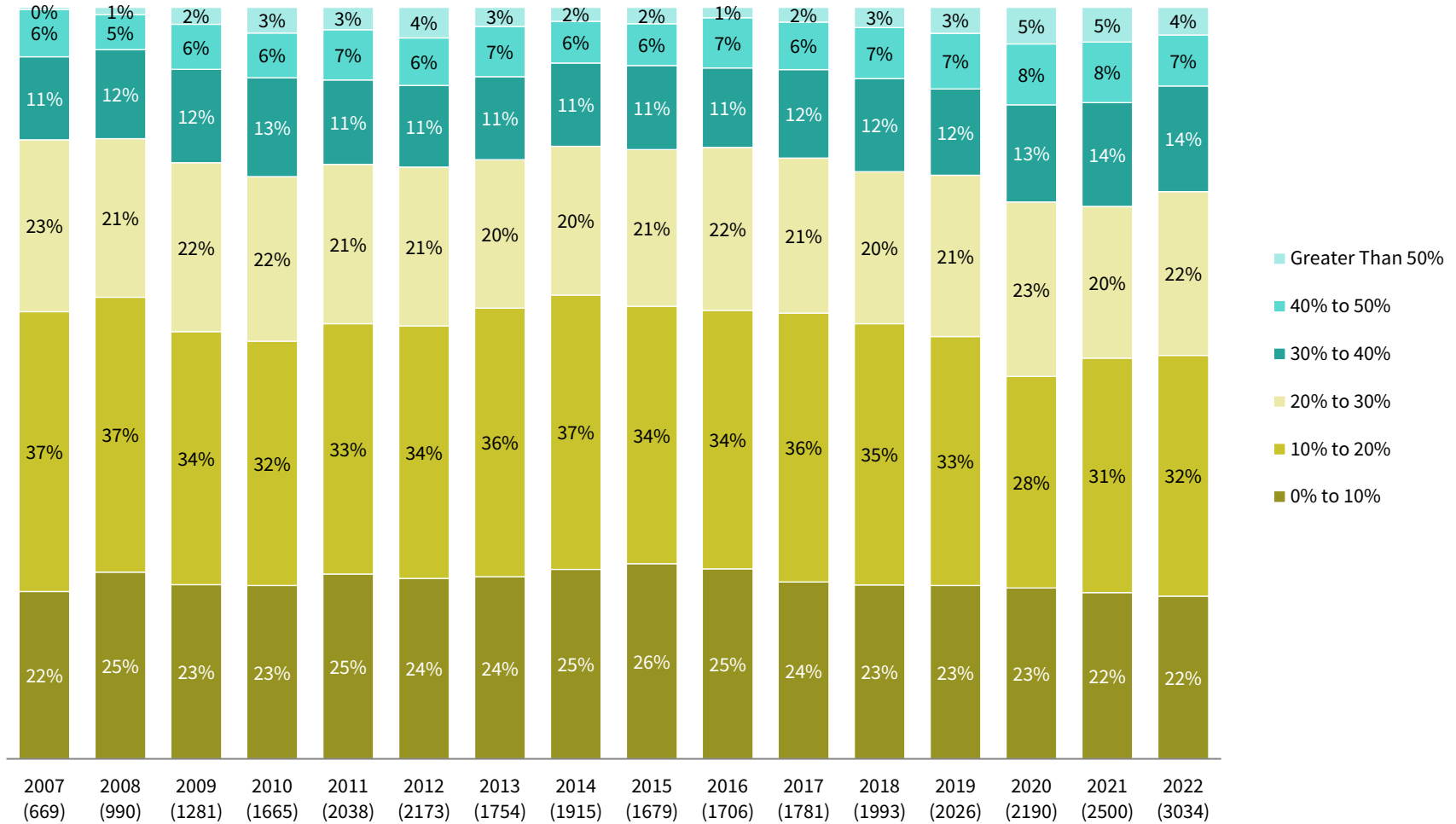


EBITDA margins were consistent from 2007–22

In 2020–22, at least 25% of companies operated at annual margins >30%. At the same time, the total universe became more heavily weighted in IT companies

AVERAGE ANNUAL EBITDA MARGIN BREAKDOWN OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • EBITDA/Revenue (%)

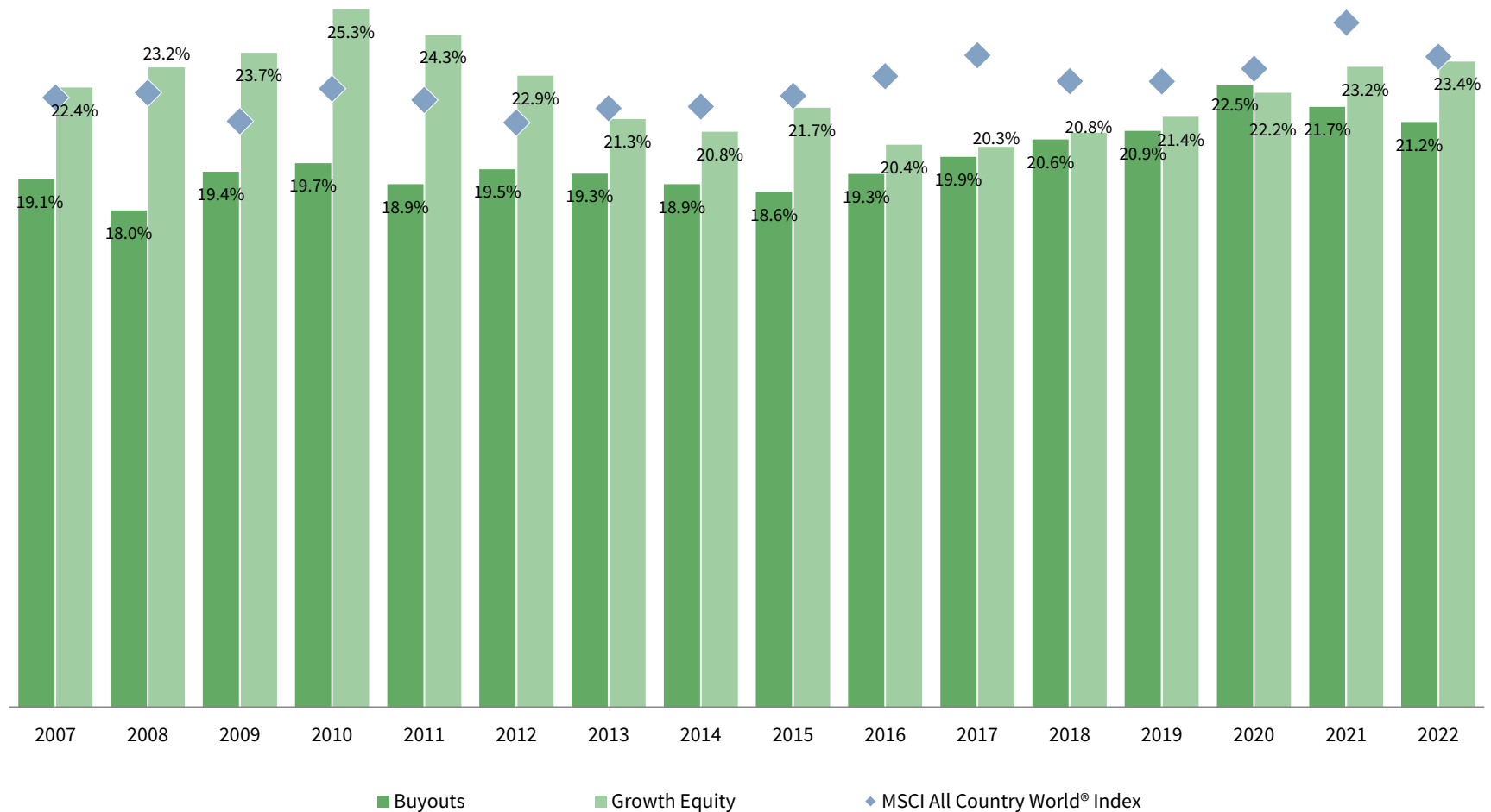


Growth equity companies operated at higher margins than buyouts in all except one of the 16 years analyzed

And growth equity margins equaled or exceeded those of public companies in half of the years analyzed

AVERAGE ANNUAL EBITDA MARGIN OF GLOBAL BUYOUT AND GROWTH EQUITY COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • EBITDA/Revenue (%)

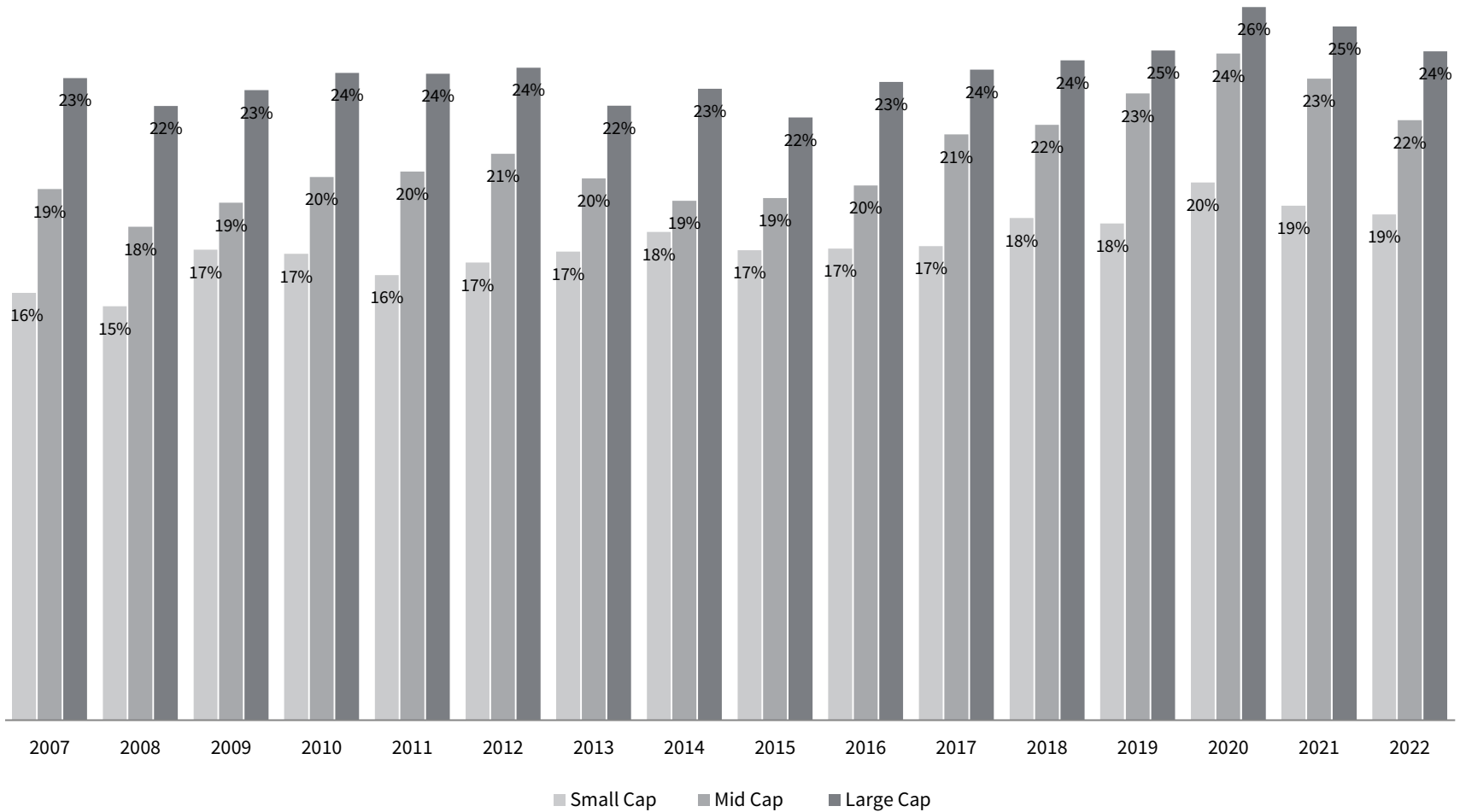


Among buyouts, margins increased with size

Only small-cap buyouts have averaged sub-20% margins over the period

AVERAGE ANNUAL EBITDA MARGIN OF GLOBAL PRIVATE EQUITY BUYOUT COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • EBITDA/Revenue (%)



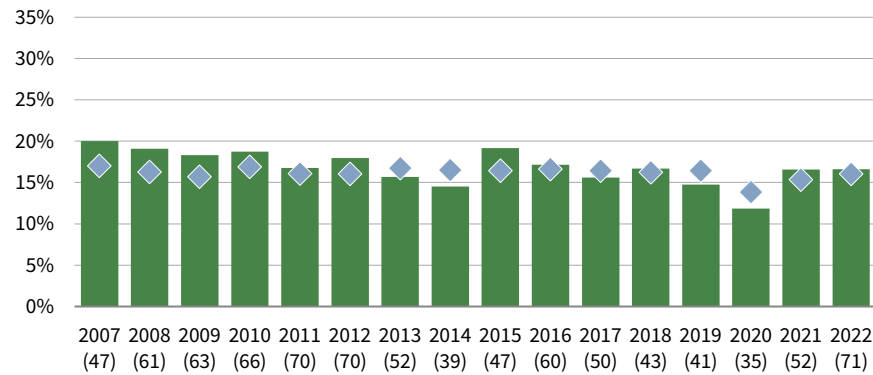
PE-backed IT companies averaged the highest margins (25%), surpassing those of public peers

Consumer discretionary and industrials averaged margins in the mid-teens

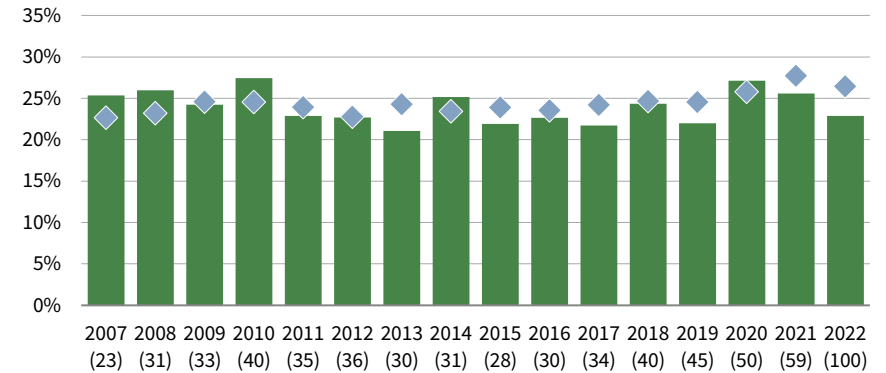
AVERAGE ANNUAL EBITDA MARGIN OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES BY SECTOR

As of December 31, 2022 • EBITDA/Revenue (%)

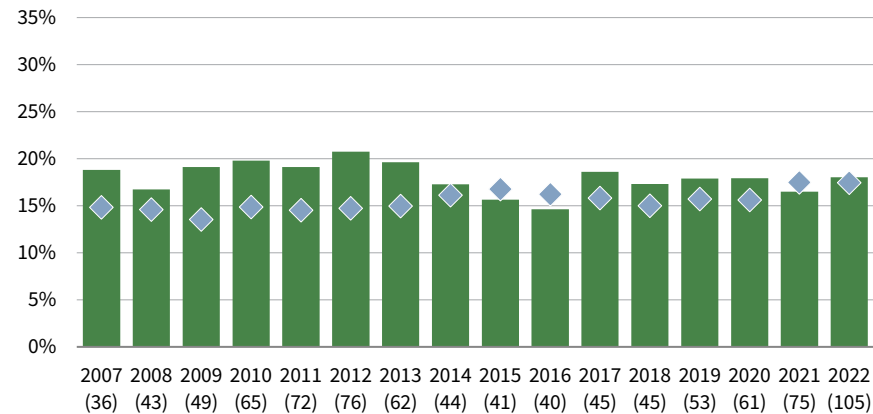
Consumer Discretionary



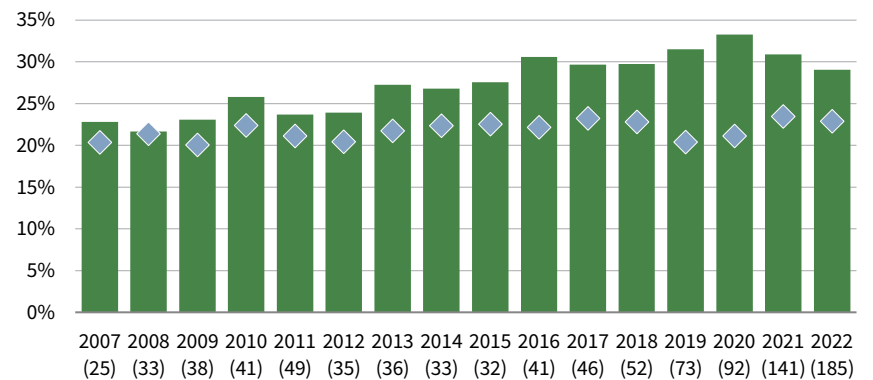
Healthcare



Industrials



Information Technology



■ PE-Owned Companies

◆ MSCI All Country World® Index

GLOBAL PRIVATE EQUITY ANALYSIS

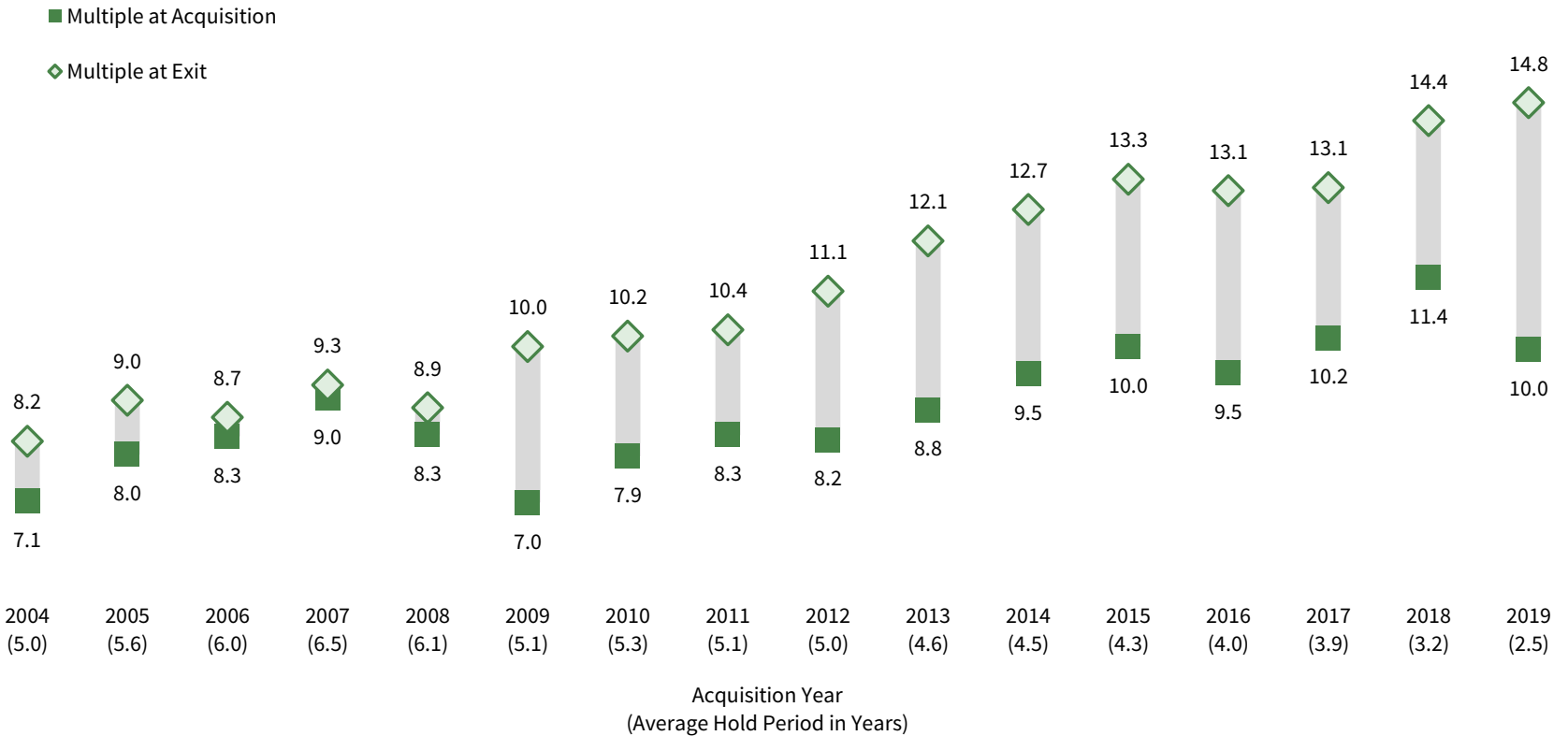
- EBITDA Purchase Price Multiple
- Leverage Multiple
- Revenue Growth
- EBITDA Growth
- EBITDA Margin
- **Exit Metrics**
- Revenue Purchase Price Multiple

Exiting into a bull market has supported multiple expansion for realized companies acquired since 2009

For companies acquired and exited from 2013–19, PPM expansion has been at least three turns of EBITDA

MEDIAN EBITDA MULTIPLE EXPANSION OF EXITED GLOBAL PRIVATE EQUITY-OWNED COMPANIES BY ACQUISITION YEAR

As of December 31, 2022 • Enterprise Value/EBITDA



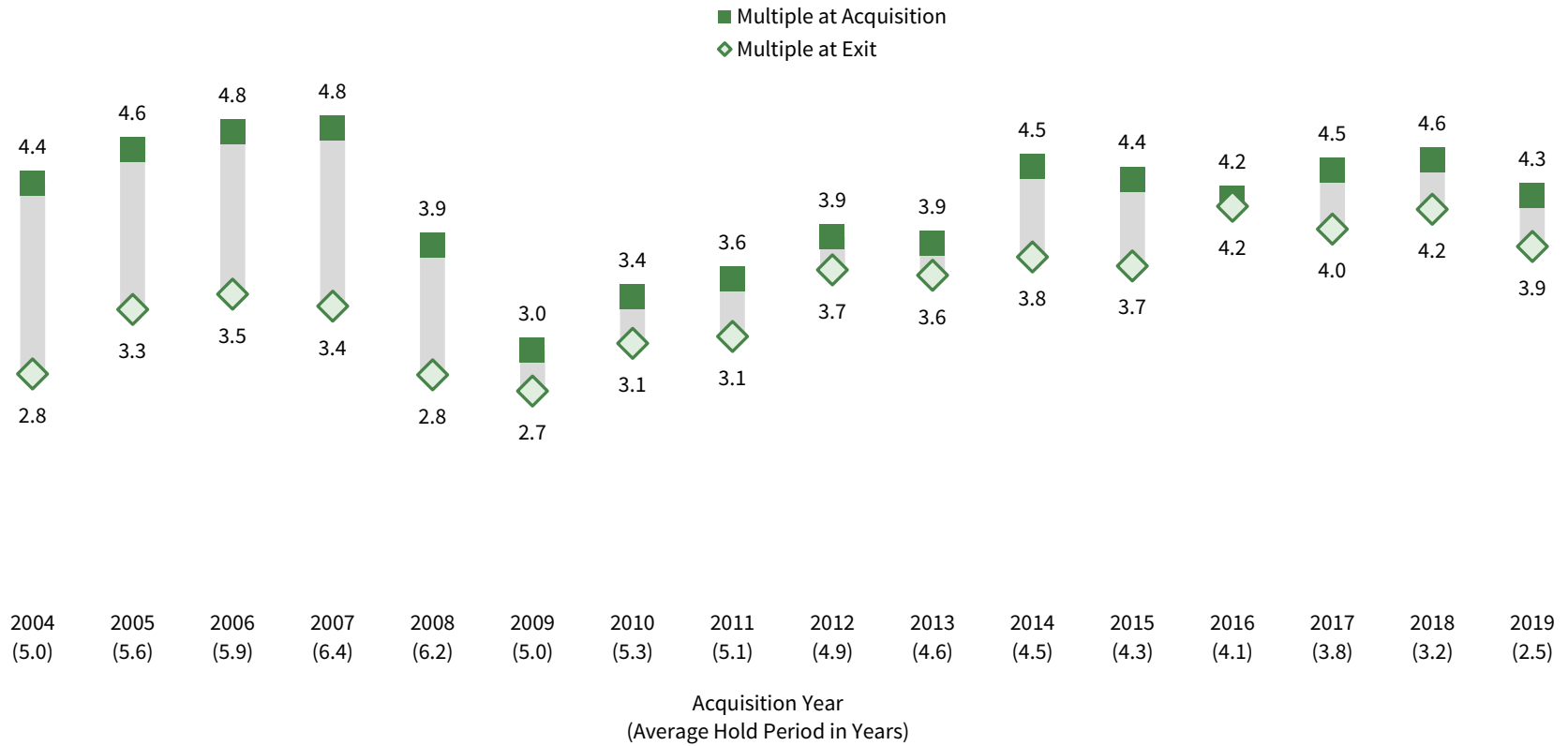
	Number of Companies																
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
PE-Owned Companies	174	256	408	449	347	184	392	345	325	242	295	252	201	145	110	55	

For companies acquired prior to the GFC, the median leverage multiple compression was more than one turn of EBITDA

For companies acquired post-GFC, changes to leverage multiples during PE ownership have been less significant

EBITDA LEVERAGE MULTIPLE COMPRESSION OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES BY ACQUISITION YEAR

As of December 31, 2022 • Net Debt/EBITDA



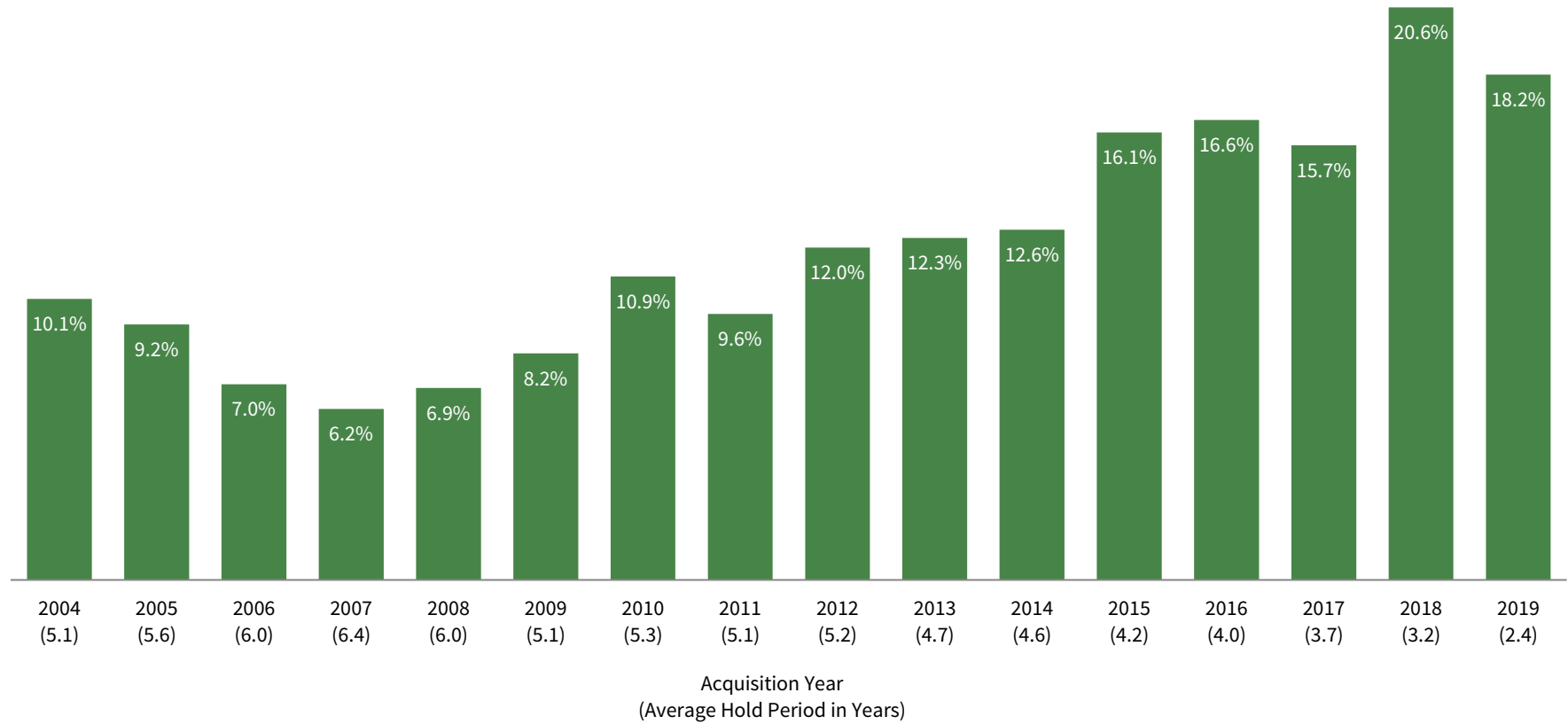
	Number of Companies																
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
PE-Owned Companies	164	225	351	385	280	127	309	271	272	188	231	208	179	132	100	51	

Median revenue CAGRs indicate generally strong growth during PE ownership

The exceptions remain companies acquired in 2006–09, for which growth was more muted

MEDIAN REVENUE CAGR OF EXITED GLOBAL PRIVATE EQUITY-OWNED COMPANIES BY ACQUISITION YEAR

As of December 31, 2022 • Compound Annual Growth Rate (%)



Number of Companies

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
PE-Owned Companies	219	308	480	544	412	231	466	422	399	295	383	349	274	219	163	78

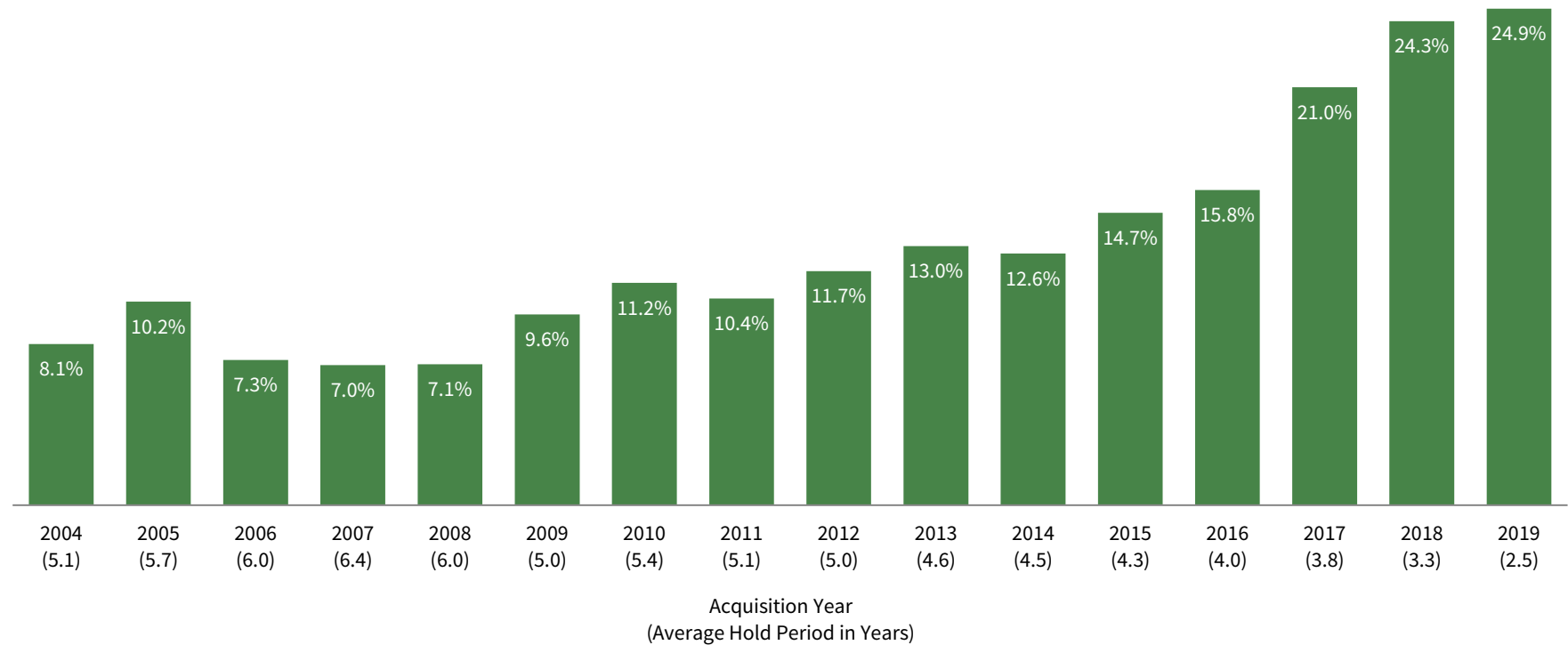
Source: Cambridge Associates LLC Private Investments Database (as reported by investment managers).

Median EBITDA growth for exited companies acquired in 2017–19 was 22.1%

For other acquisition years beginning with the GFC (2009–16), the median CAGR stands at 12.3%

MEDIAN EBITDA CAGR OF EXITED GLOBAL PRIVATE EQUITY-OWNED COMPANIES BY ACQUISITION YEAR

As of December 31, 2022 • Compound Annual Growth Rate (%)



	Number of Companies															
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
PE-Owned Companies	191	282	430	492	375	193	406	360	340	250	310	269	215	158	116	57

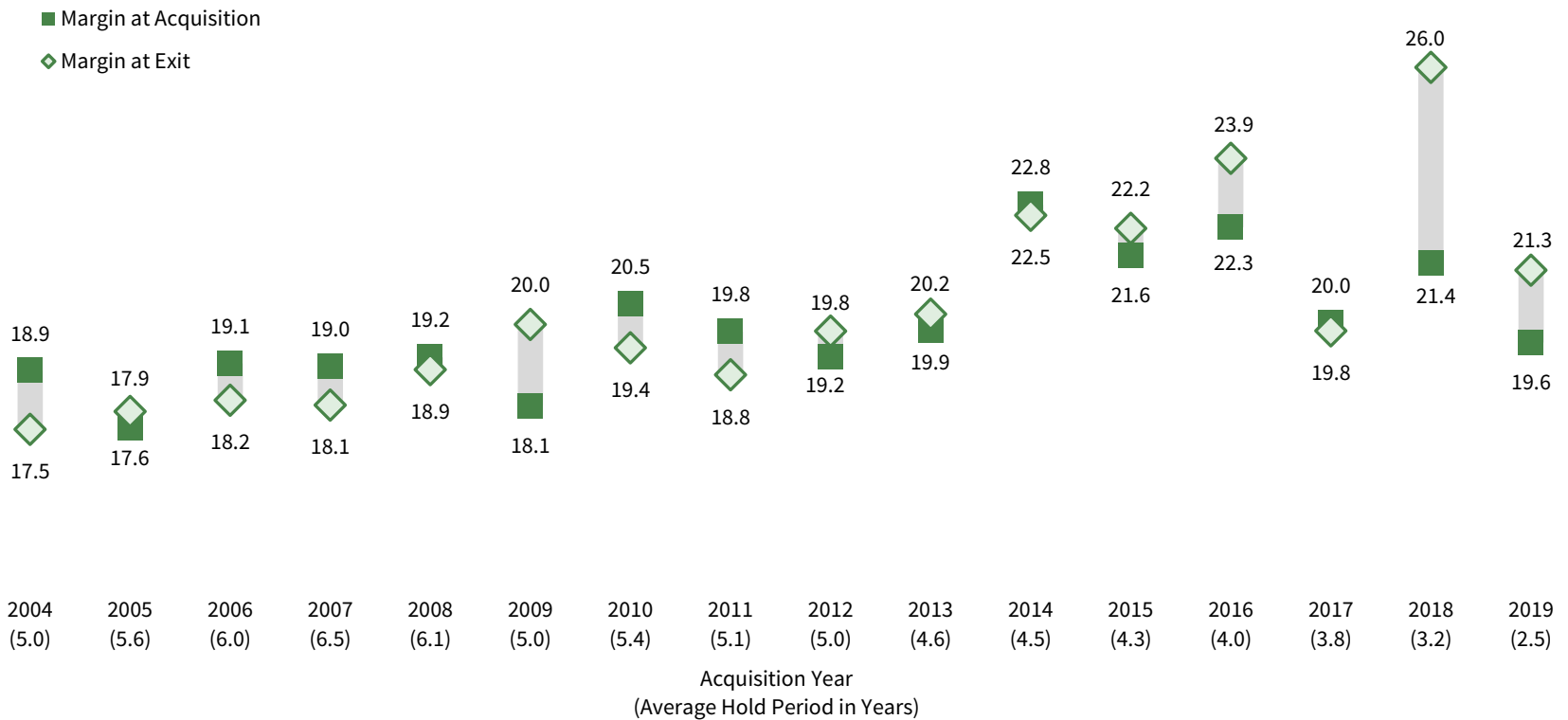
Source: Cambridge Associates LLC Private Investments Database (as reported by investment managers).

EBITDA margins historically consistent from acquisition to exit

From year to year, the analysis suggests that the most meaningful changes in EBITDA margins are seen in companies held for the shortest amount of time

MEDIAN EBITDA MARGIN EXPANSION OF EXITED GLOBAL PRIVATE EQUITY-OWNED COMPANIES BY ACQUISITION YEAR

As of December 31, 2022 • EBITDA/Revenue (%)



	Number of Companies																
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
PE-Owned Companies	183	273	416	475	358	189	398	354	335	247	308	269	211	157	110	55	

GLOBAL PRIVATE EQUITY ANALYSIS

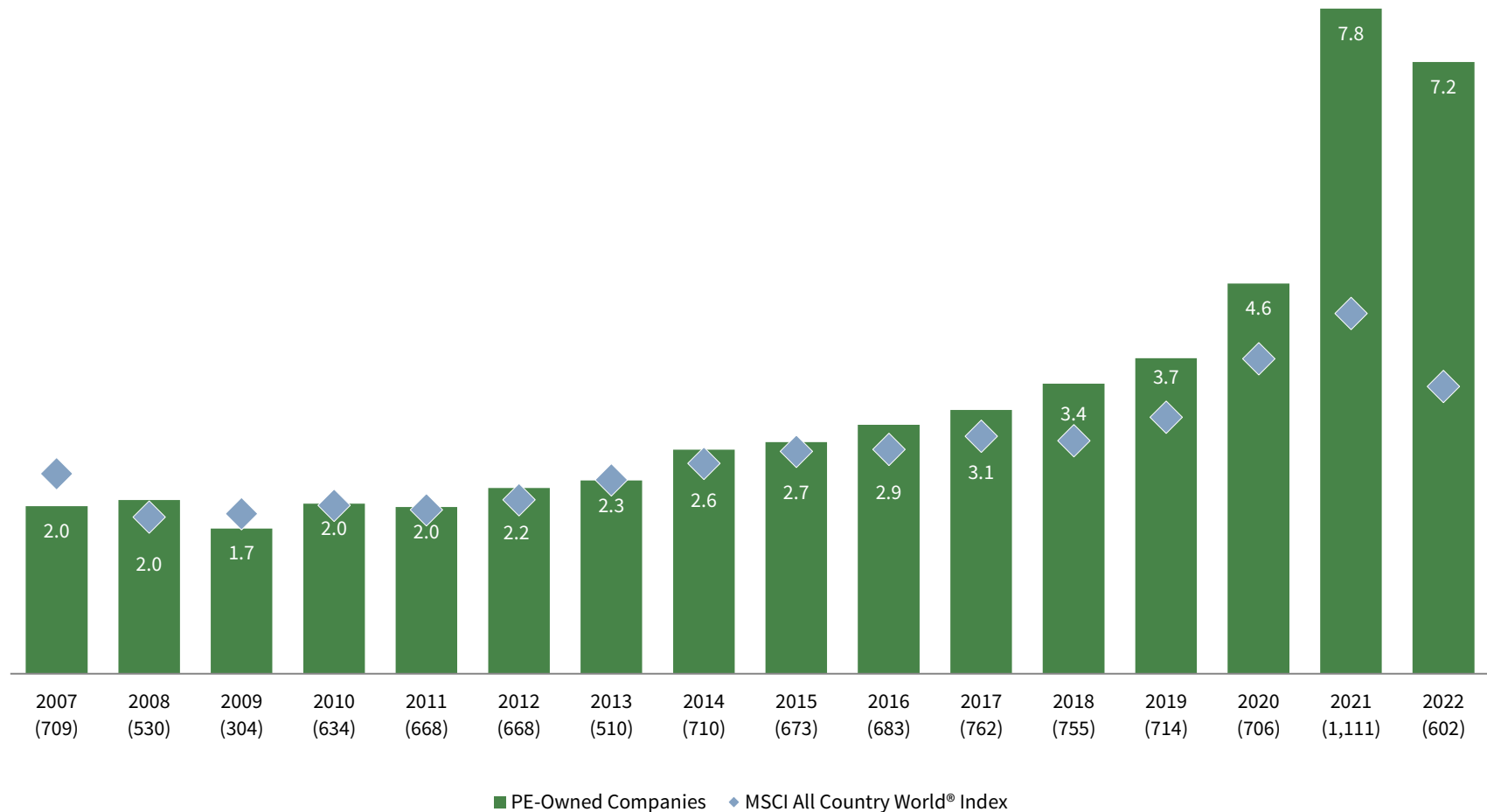
- EBITDA Purchase Price Multiple
- Leverage Multiple
- Revenue Growth
- EBITDA Growth
- EBITDA Margin
- Exit Metrics
- **Revenue Purchase Price Multiple**

Revenue PPMs declined in 2022, more so for public companies

Over the past two years, average PE valuations exceeded those of public companies by the widest margin of the time period analyzed

AVERAGE REVENUE PURCHASE PRICE MULTIPLES AT ACQUISITION OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Enterprise Value/LTM Revenue



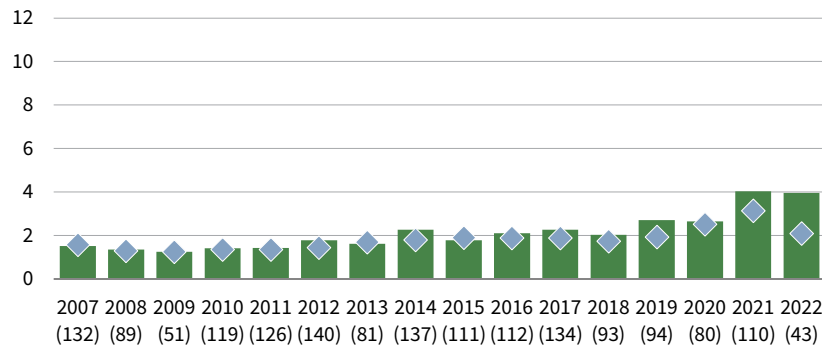
In PE universe, only IT revenue PPMs declined in 2022

While PPMs for industrial companies hit their highest point of the 16-year period

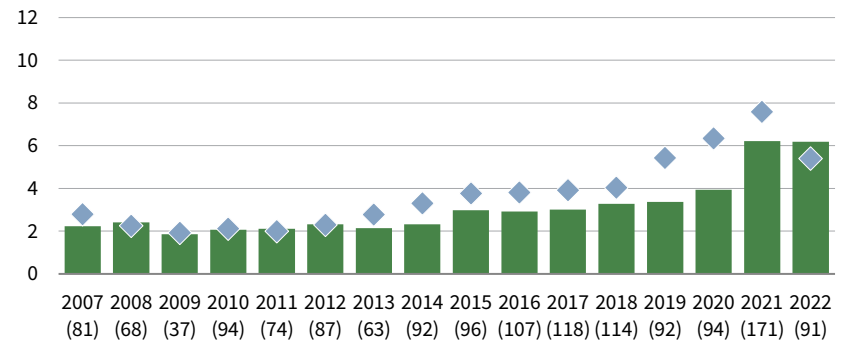
AVERAGE REVENUE PURCHASE PRICE MULTIPLES AT ACQUISITION OF GLOBAL PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES BY SECTOR

As of December 31, 2022 • Enterprise Value/Revenue

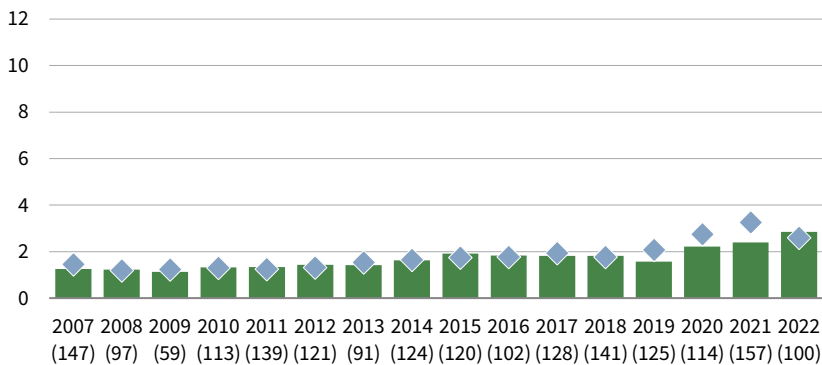
Consumer Discretionary



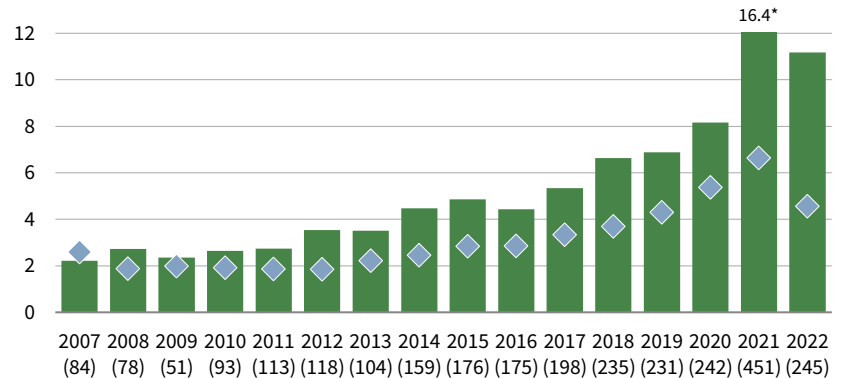
Healthcare



Industrials



Information Technology



■ PE-Owned Companies ◆ MSCI All Country World® Index

* Axis has been capped at 12x for scaling purposes.



Sources: Cambridge Associates LLC Private Investments Database (as reported by investment managers), FactSet Research Systems, and MSCI Inc. MSCI data provided "as is" without any express or implied warranties. Notes: Outliers were identified and excluded, and the same methodology was applied to the private equity and public company universes. Numbers in parentheses represent number of private equity-owned companies in each year.

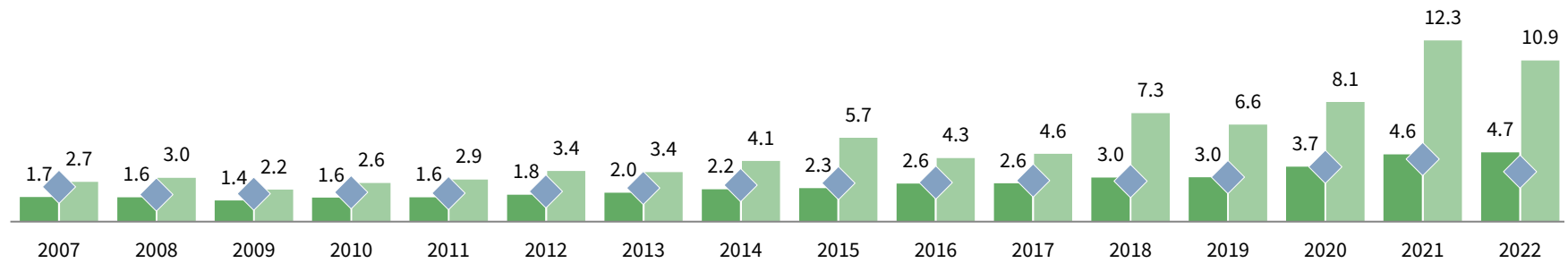
Buyout revenue PPMs continued their gradual rise in 2022

Growth equity revenue-based valuations in general, and particularly those for investments in IT companies, meaningfully declined

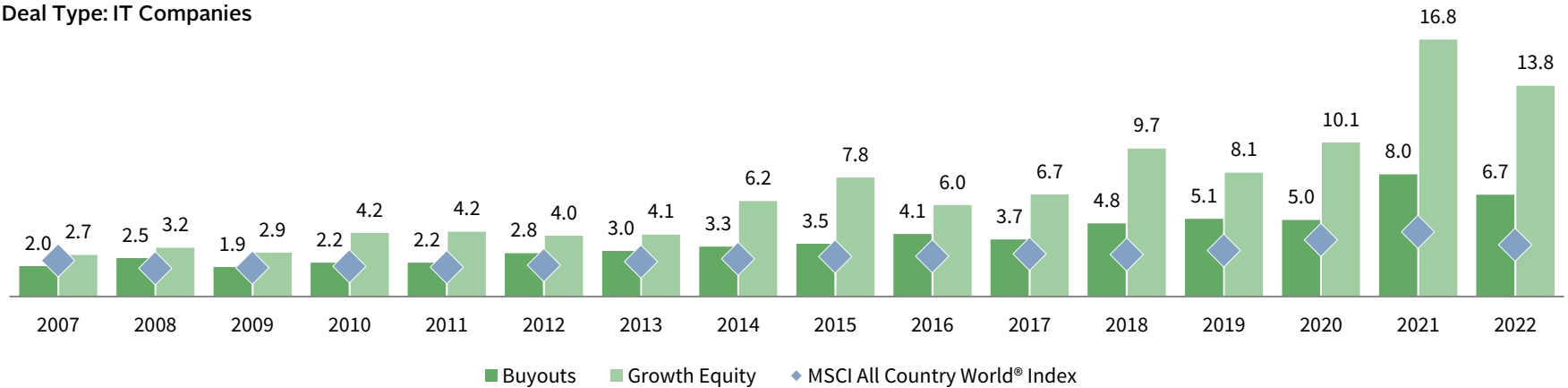
AVERAGE REVENUE PURCHASE PRICE MULTIPLES AT ACQUISITION BY DEAL TYPE AND SECTOR VS PUBLIC COMPANIES

As of December 31, 2022 • Enterprise Value/LTM Revenue

Deal Type: All Companies



Deal Type: IT Companies





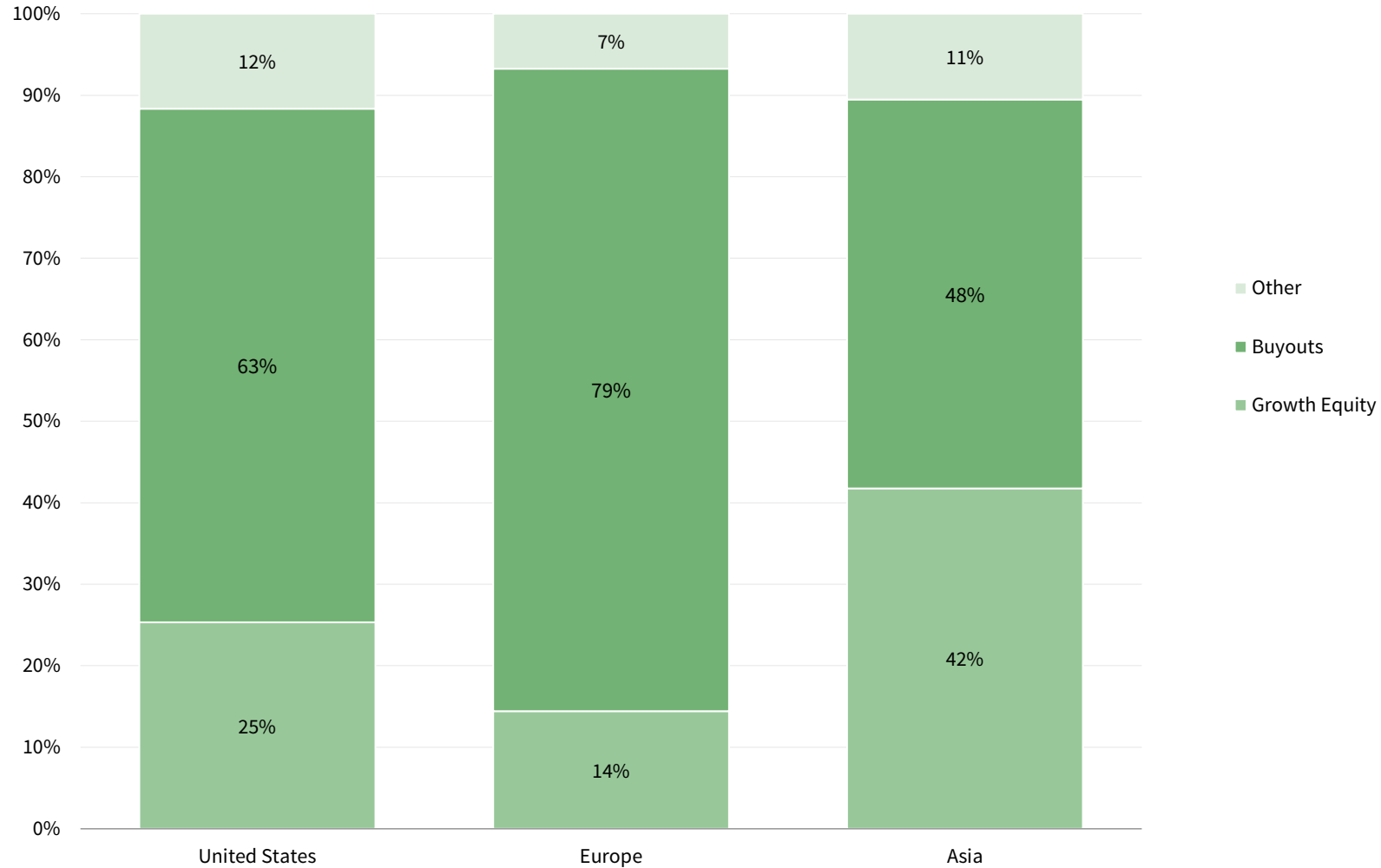
**REGIONAL COMPARISONS:
ASIA, EUROPE, AND THE UNITED STATES**

The European and US samples have remained more heavily weighted toward buyouts

Historically growth oriented, the Asian sample has become more balanced over time

BREAKDOWN OF INVESTMENT STRATEGIES BY REGION

As of December 31, 2022 • Percent (%)

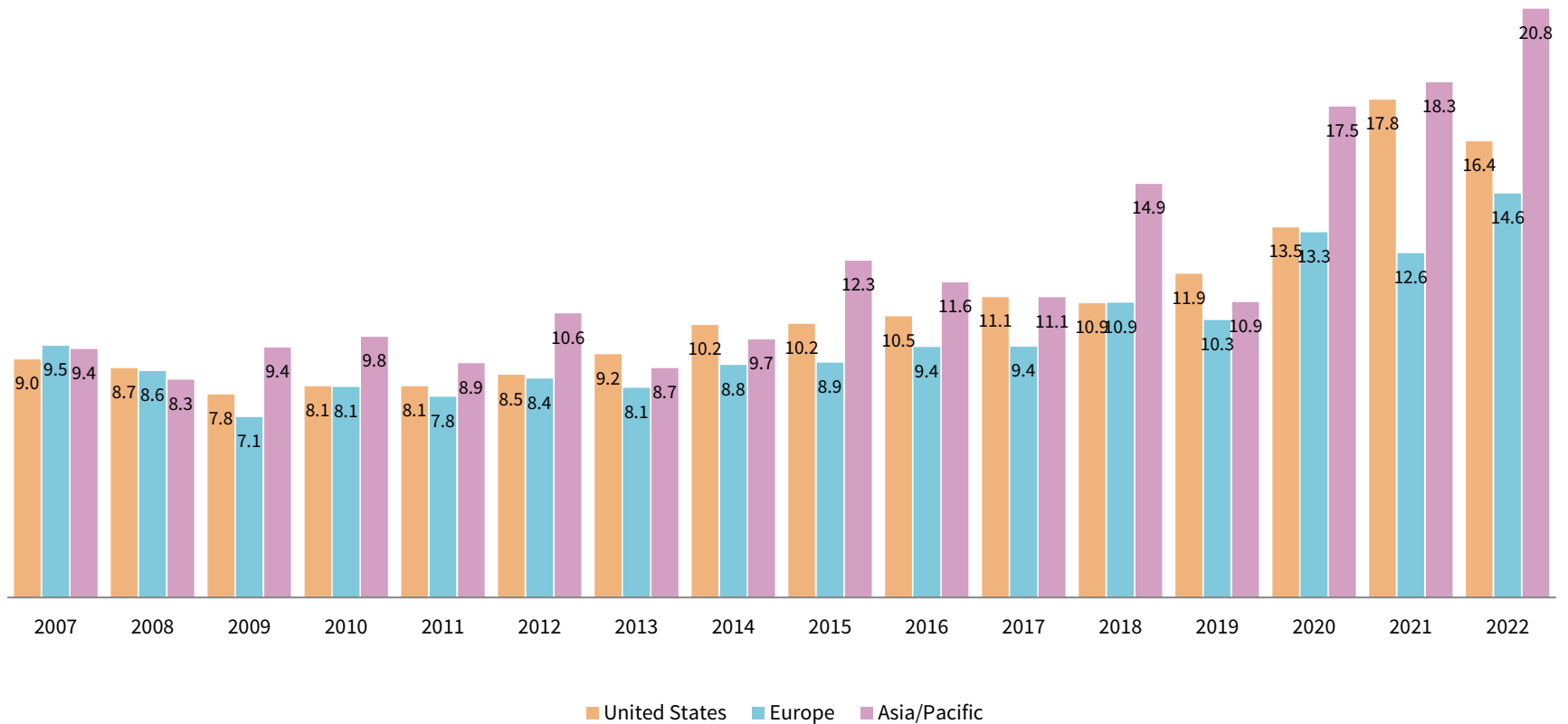


In 2022, PPMs in Asia and Europe continued to climb, while they fell in the United States

One-third of PE acquisitions in Europe in 2022 were IT companies, helping to increase the region's average EBITDA PPMs

AVERAGE EBITDA PURCHASE PRICE MULTIPLES AT ACQUISITION OF PRIVATE COMPANIES BY REGION

As of December 31, 2022 • Enterprise Value/EBITDA

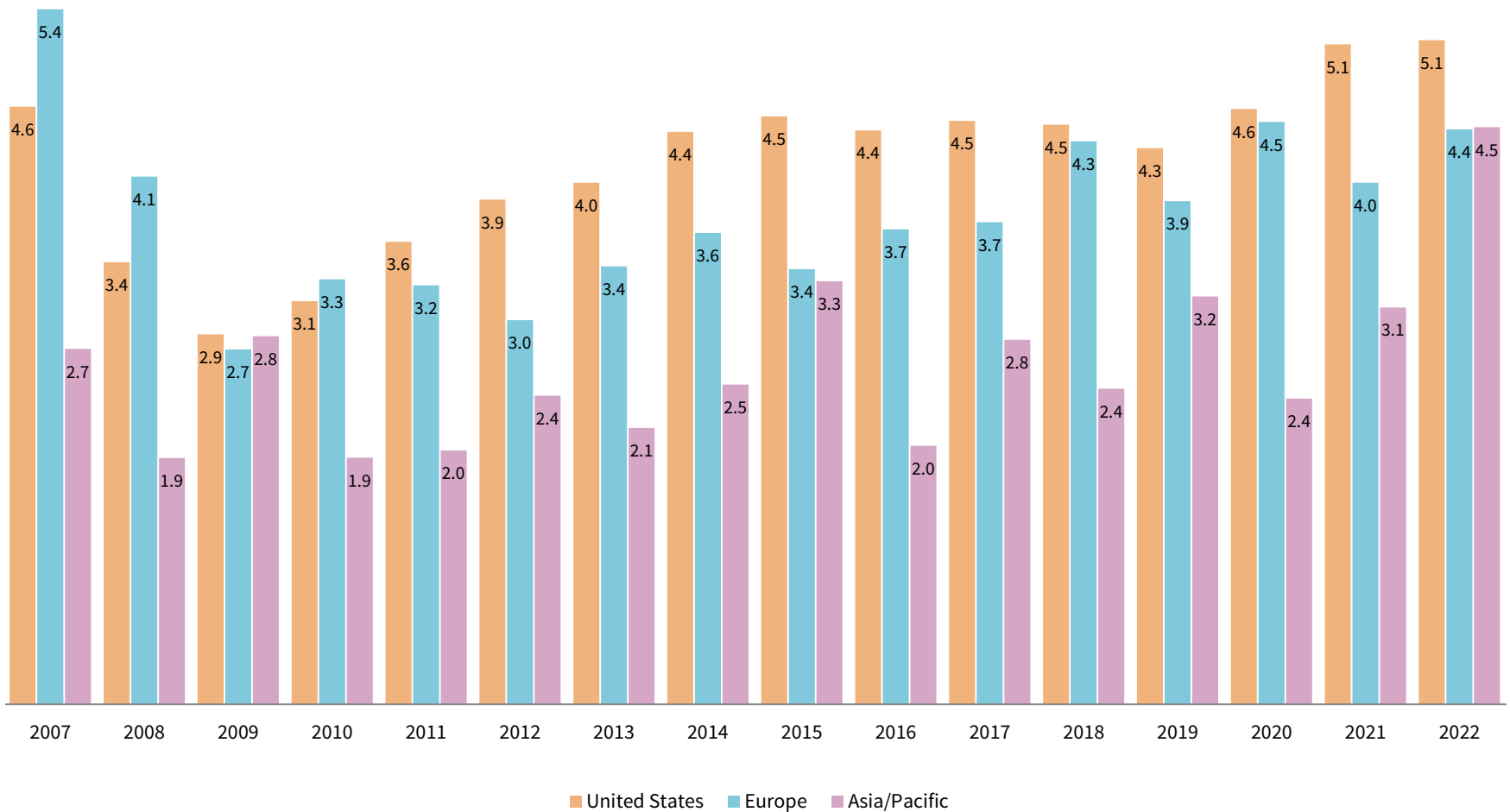


In every year since 2011, US-based acquisitions averaged the highest leverage multiples

Average leverage multiples in Asia approximated those in Europe in 2022, driven at least in part by the higher-than-normal percentage of buyout transactions in the Asian sample

AVERAGE EBITDA LEVERAGE MULTIPLES AT ACQUISITION OF PRIVATE COMPANIES BY REGION

As of December 31, 2022 • Net Debt/EBITDA



From 2021 highs, revenue growth held up the best in Europe and the worst in Asia in 2022

Asia-based companies averaged the highest revenue growth every year from 2008–14 but led in only one year since 2015. Over the full period, revenue growth in Asia and the United States is ~13% and ~9% in Europe

AVERAGE ANNUAL REVENUE GROWTH OF PRIVATE EQUITY-OWNED COMPANIES BY REGION

As of December 31, 2022 • Annual Growth Rate (%)

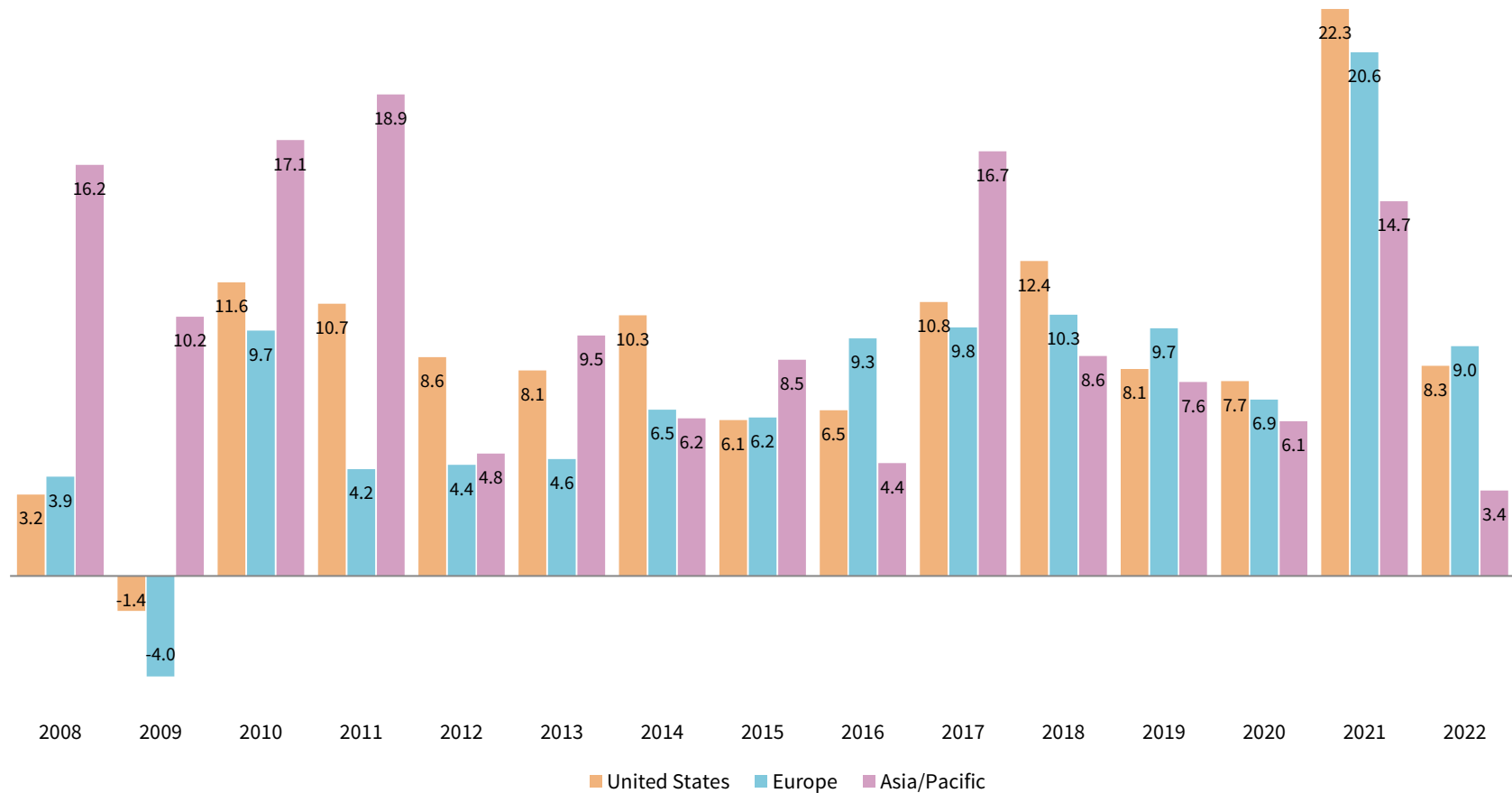


PE-backed US and European companies have averaged higher EBITDA growth than their Asia-based peers every year since 2018

Over the full period, however, Asia has led the other regions, averaging 10% annual growth, followed by the United States (9%) and Europe (7%)

AVERAGE ANNUAL EBITDA GROWTH OF PRIVATE EQUITY-OWNED COMPANIES BY REGION

As of December 31, 2022 • Annual Growth Rate (%)



Over the period analyzed, average margins across regions were approximately 20% per year

US company margins have been the highest the past three years

AVERAGE ANNUAL EBITDA MARGIN OF PRIVATE EQUITY-OWNED COMPANIES BY REGION

As of December 31, 2022 • EBITDA/Revenue (%)

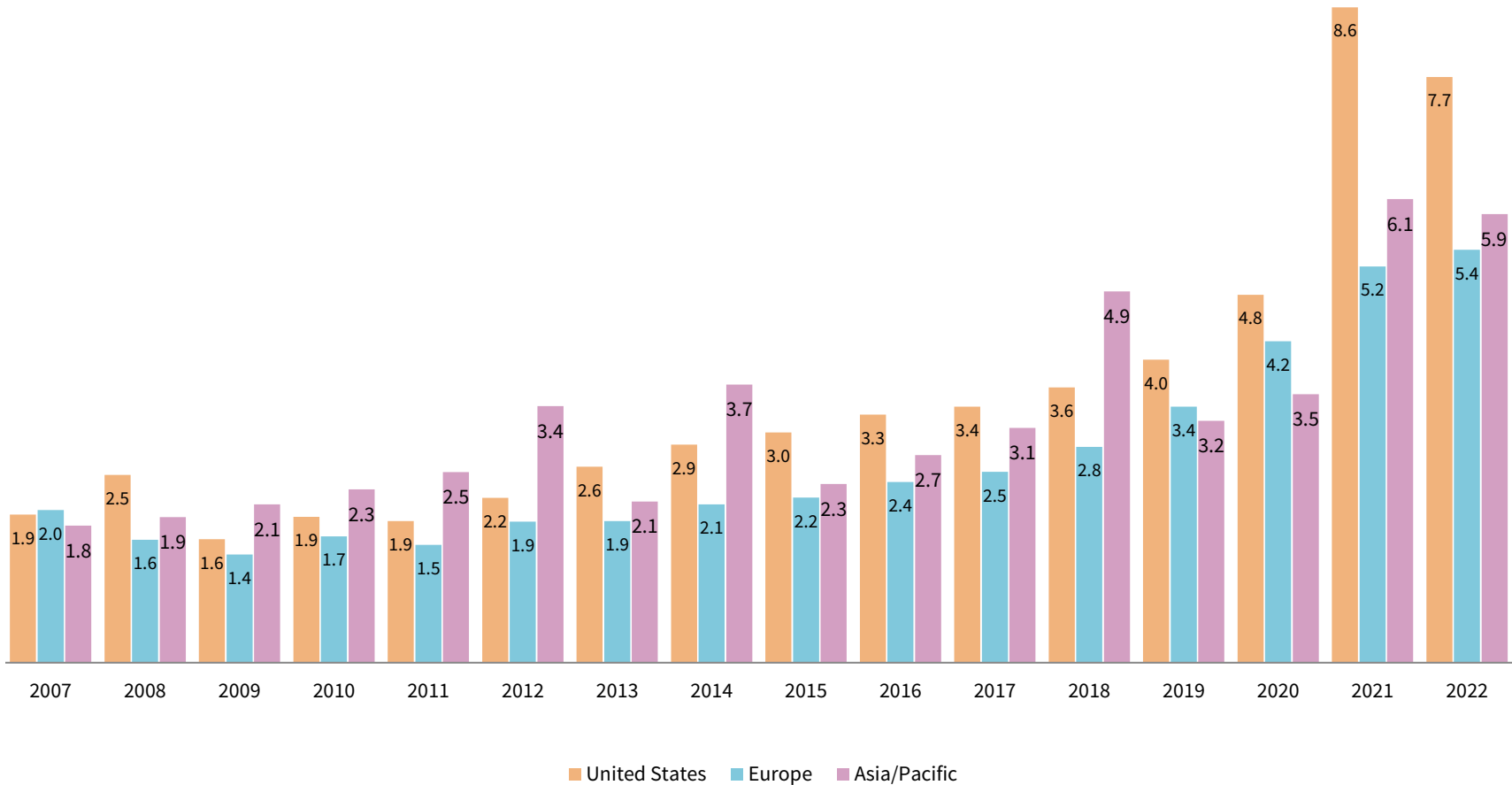


From 2011–20, in all regions, revenue PPMs averaged between 2x and 3x for all regions

In 2021 and 2022, revenue multiples averaged 5x in Europe, 6x in Asia, and 8x in the United States

AVERAGE REVENUE PURCHASE PRICE MULTIPLES AT ACQUISITION OF PRIVATE COMPANIES BY REGION

As of December 31, 2022 • Enterprise Value/Revenue



EUROPEAN PRIVATE EQUITY ANALYSIS

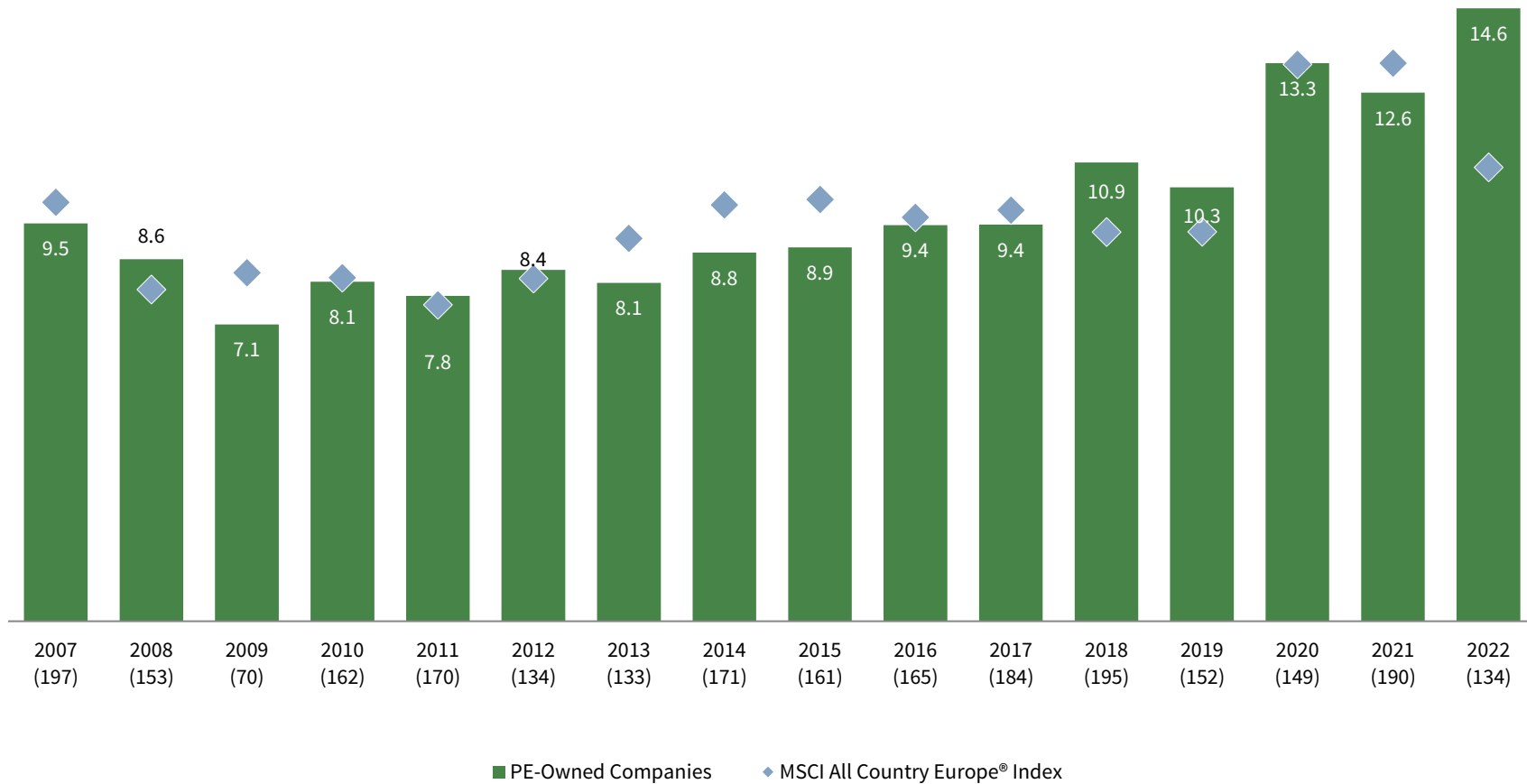
- **Purchase Price Multiple**
- Leverage Multiple
- Revenue Growth
- EBITDA Growth
- EBITDA Margin
- Exit Metrics

PPMs climbed to record highs in 2022 for PE, but dropped meaningfully for public

In 2022, the PE premium to public counterparts was the largest recorded since 2007

AVERAGE EBITDA PURCHASE PRICE MULTIPLES AT ACQUISITION OF EUROPEAN PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Enterprise Value/EBITDA

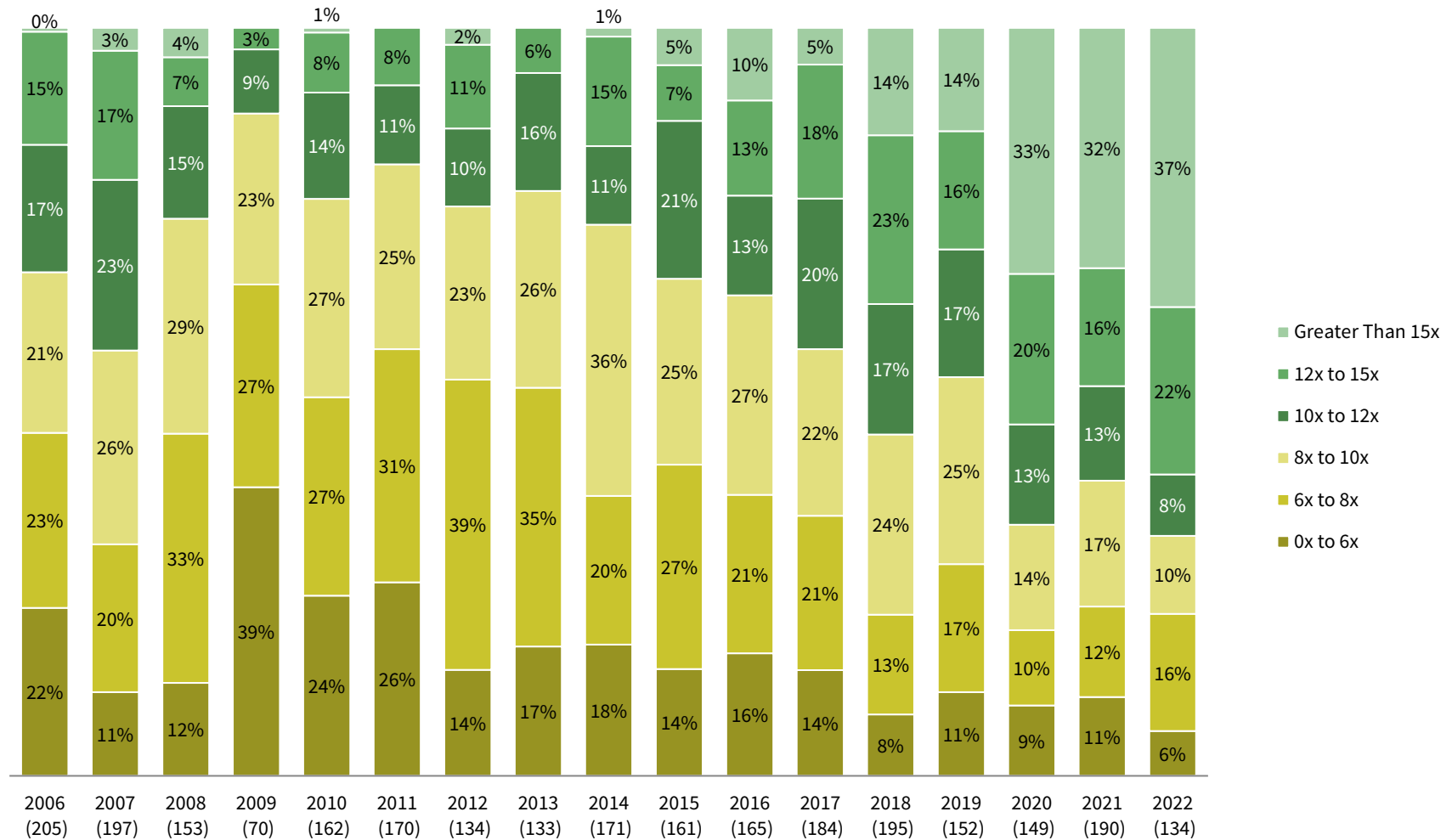


2022 marked the largest percentage of deals (37%) transacted above 15x EBITDA

But based on the number of deals in the 2022 sample, it was a slower year than 2021

AVERAGE EBITDA PURCHASE PRICE MULTIPLE BREAKDOWN OF EUROPEAN PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Enterprise Value/EBITDA

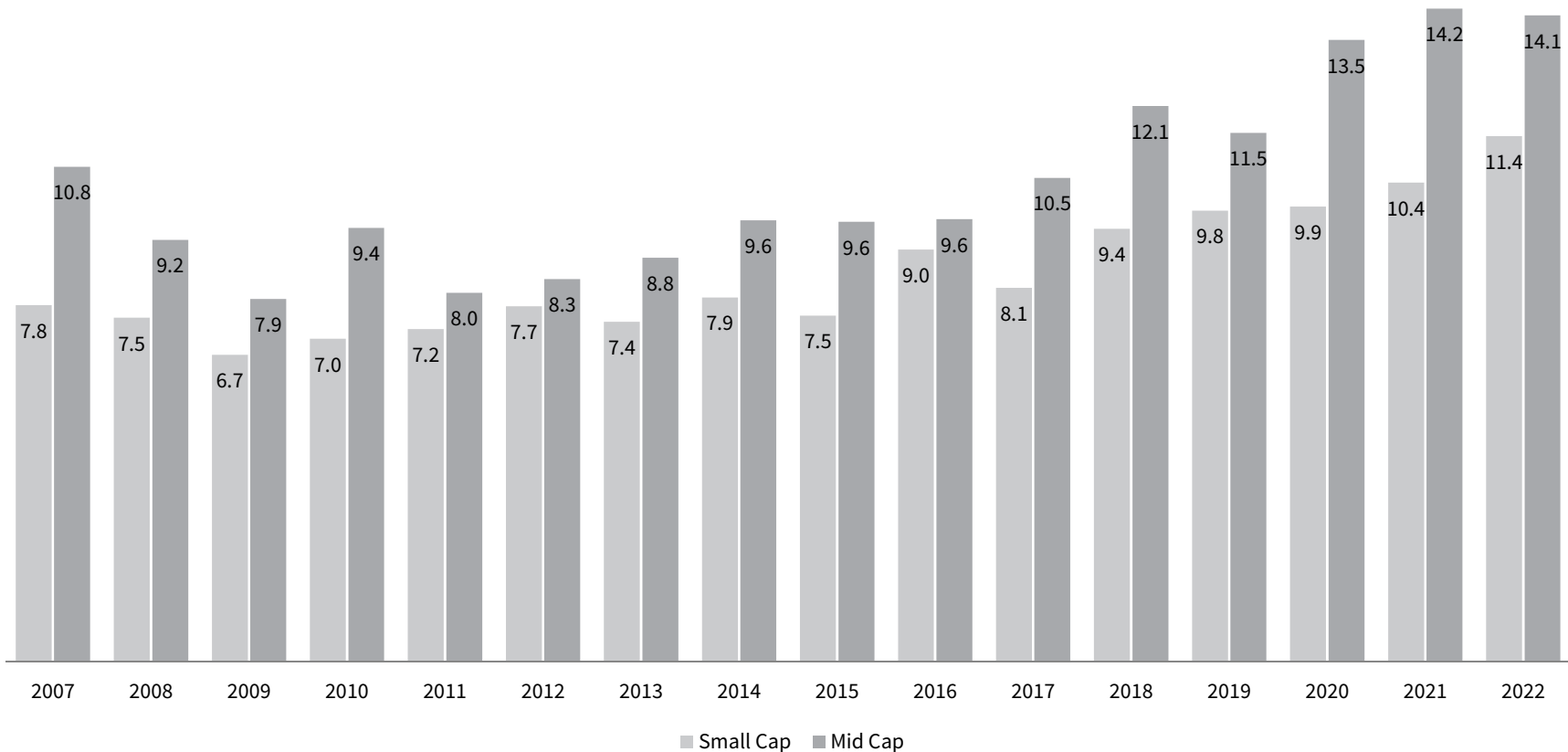


PPMs for small-cap buyouts have increased five years in a row, reaching a new high in 2022

Mid-cap valuations have also been trending higher, and the difference between mid- and small-cap valuations has expanded

AVERAGE EBITDA PURCHASE PRICE MULTIPLES AT ACQUISITION OF EUROPEAN PRIVATE EQUITY BUYOUT COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • Enterprise Value/EBITDA



EUROPEAN PRIVATE EQUITY ANALYSIS

- Purchase Price Multiple
- **Leverage Multiple**
- Revenue Growth
- EBITDA Growth
- EBITDA Margin
- Exit Metrics

After declining in 2021, leverage multiples for PE-backed companies picked back up in 2022

Public company leverage has remained consistent over time and across market cycles

AVERAGE EBITDA LEVERAGE MULTIPLES AT ACQUISITION OF EUROPEAN PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Net Debt/EBITDA

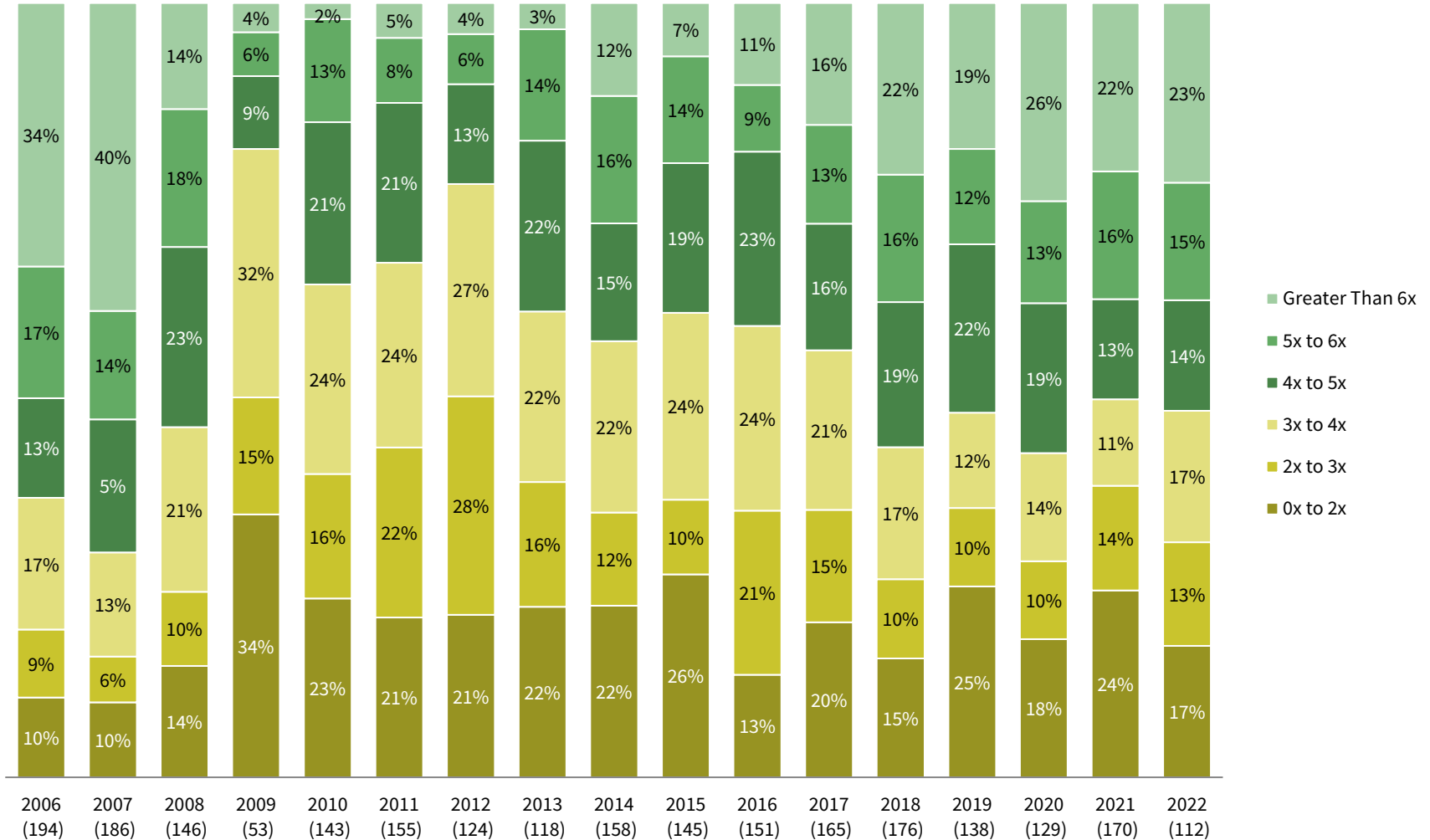


The percentage of deals transacted at leverage multiples of 4x or greater has remained relatively flat for five years

Interest rate hikes in 2022 didn't seem to have an immediate impact on the use of leverage

AVERAGE LEVERAGE MULTIPLE BREAKDOWN OF EUROPEAN PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Net Debt/EBITDA



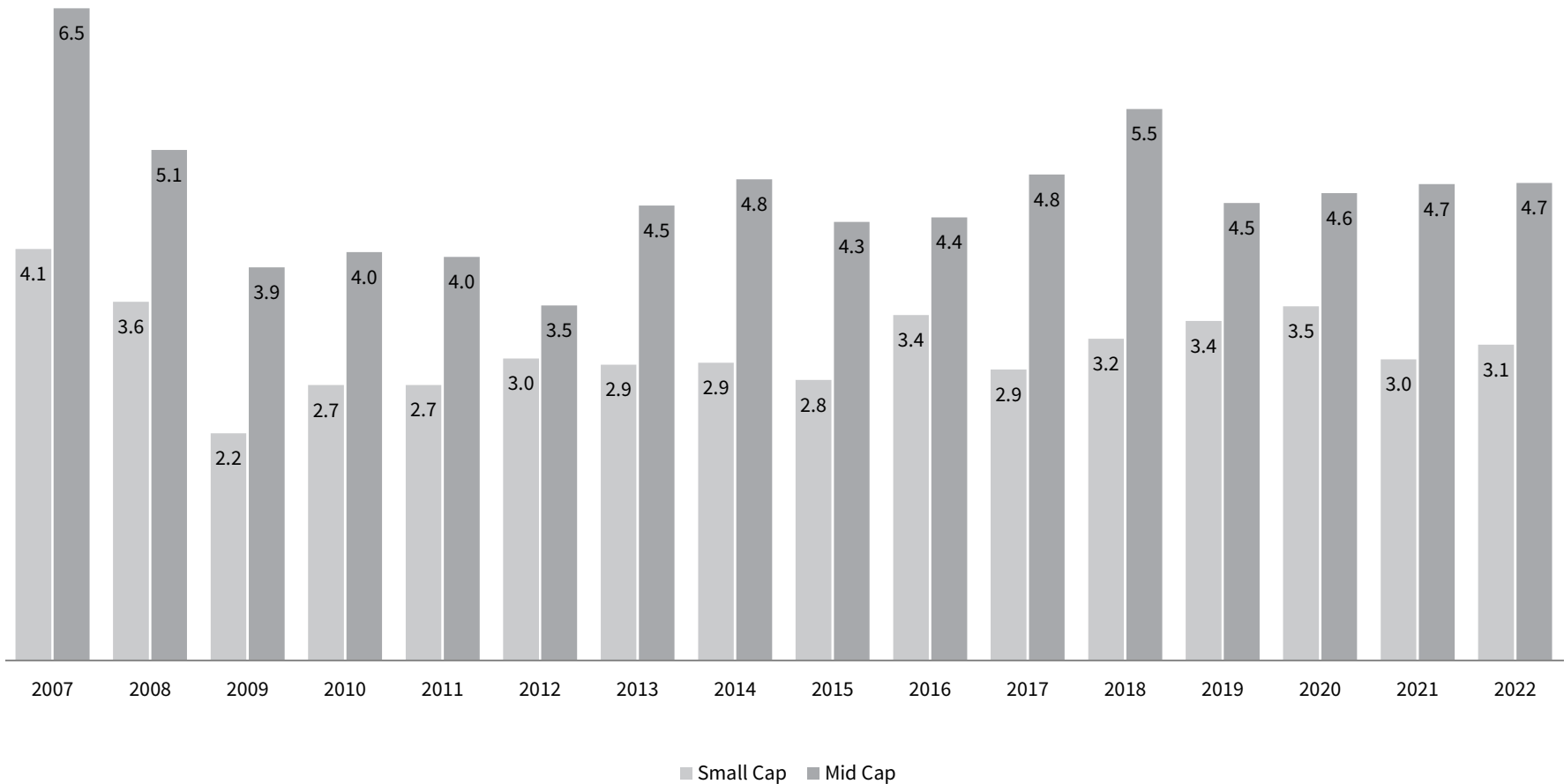
Source: Cambridge Associates LLC Private Investments Database (as reported by investment managers).
 Notes: Outliers were identified and excluded. Numbers in parentheses represent total private companies in a year. Each range includes the lower bound value. For example, the "4x to 5x" range includes companies with reported leverage multiples of exactly 4x. The majority of deals in the European private equity LM sample are buyouts. Due to rounding, totals may not sum to 100%.

Small buyout leverage multiples averaged about a turn and a half lower than mid caps over the full period, at 3.1x and 4.7x, respectively

While not shown, the average for deals larger than \$1B since 2007 was 5.5x

AVERAGE EBITDA LEVERAGE MULTIPLES AT ACQUISITION OF EUROPEAN PRIVATE EQUITY BUYOUT COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • Net Debt/EBITDA



EUROPEAN PRIVATE EQUITY ANALYSIS

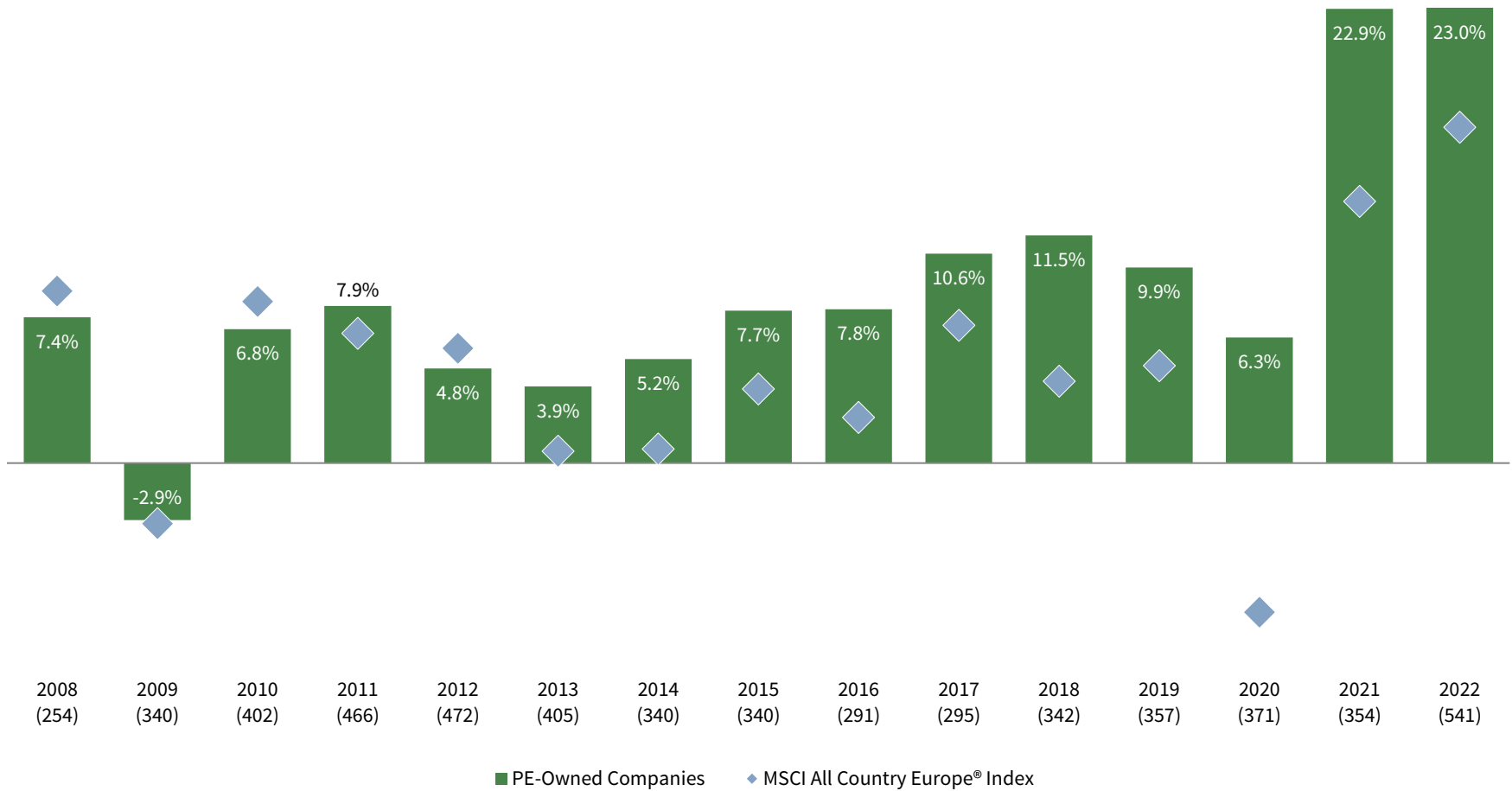
- Purchase Price Multiple
- Leverage Multiple
- **Revenue Growth**
- EBITDA Growth
- EBITDA Margin
- Exit Metrics

2021 and 2022 were banner years for both PE and public revenue growth

In 2022, PE-backed and public companies grew revenue at three times and four times their prior long-term averages, respectively

AVERAGE ANNUAL REVENUE GROWTH OF EUROPEAN PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

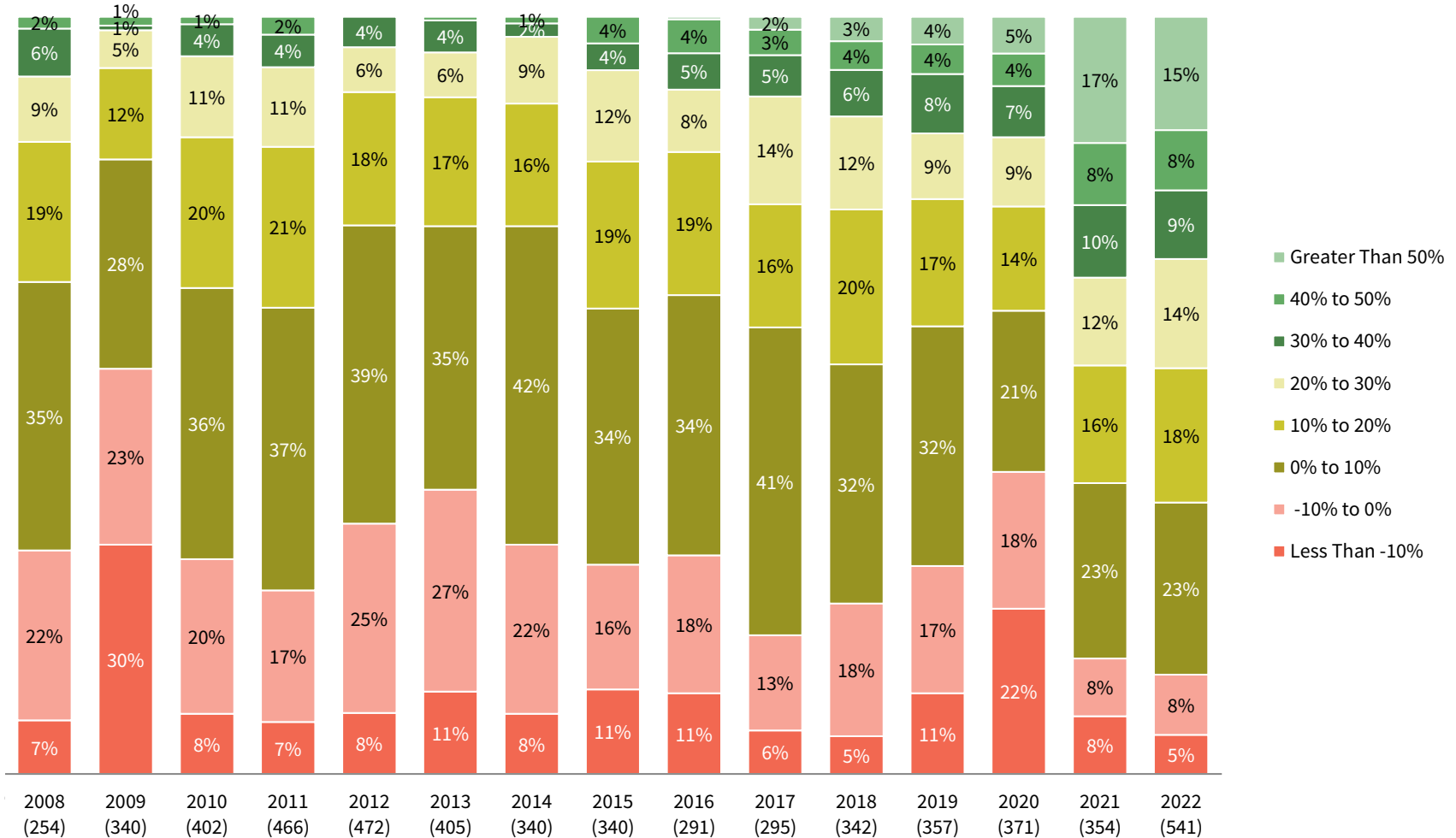


Despite economic headwinds, about one-third of companies grew revenue by 30% or more in 2022

The dispersion overall looked similar to that of the prior year

AVERAGE ANNUAL REVENUE GROWTH BREAKDOWN OF EUROPEAN PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

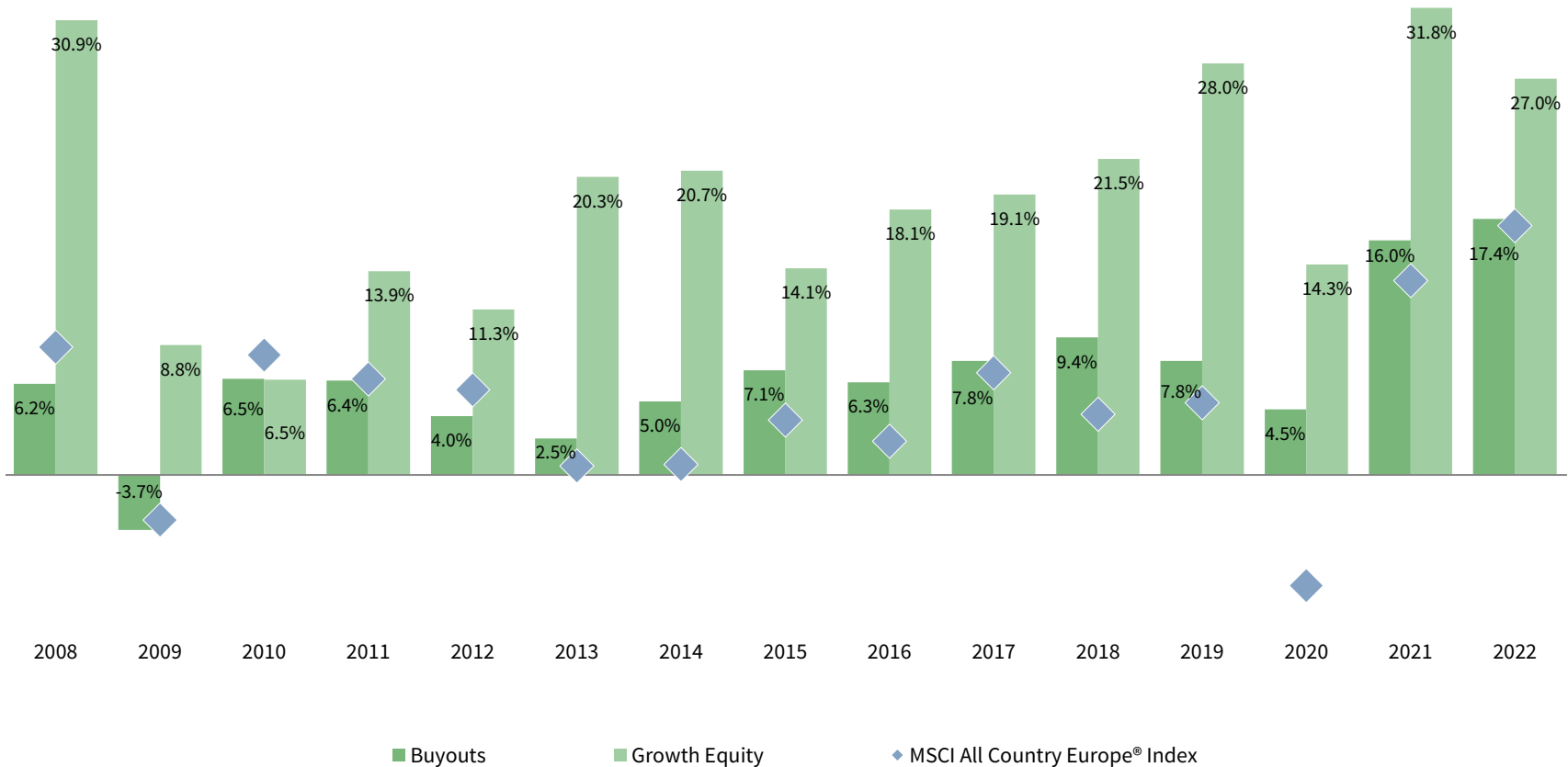


Over time, buyout and public revenue growth have been similar, and both experienced modest increases in 2022

Growth equity revenue growth decreased in 2022, but remained well above (~10%) those of public and buyout companies

AVERAGE ANNUAL REVENUE GROWTH OF EUROPEAN BUYOUT AND GROWTH EQUITY COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

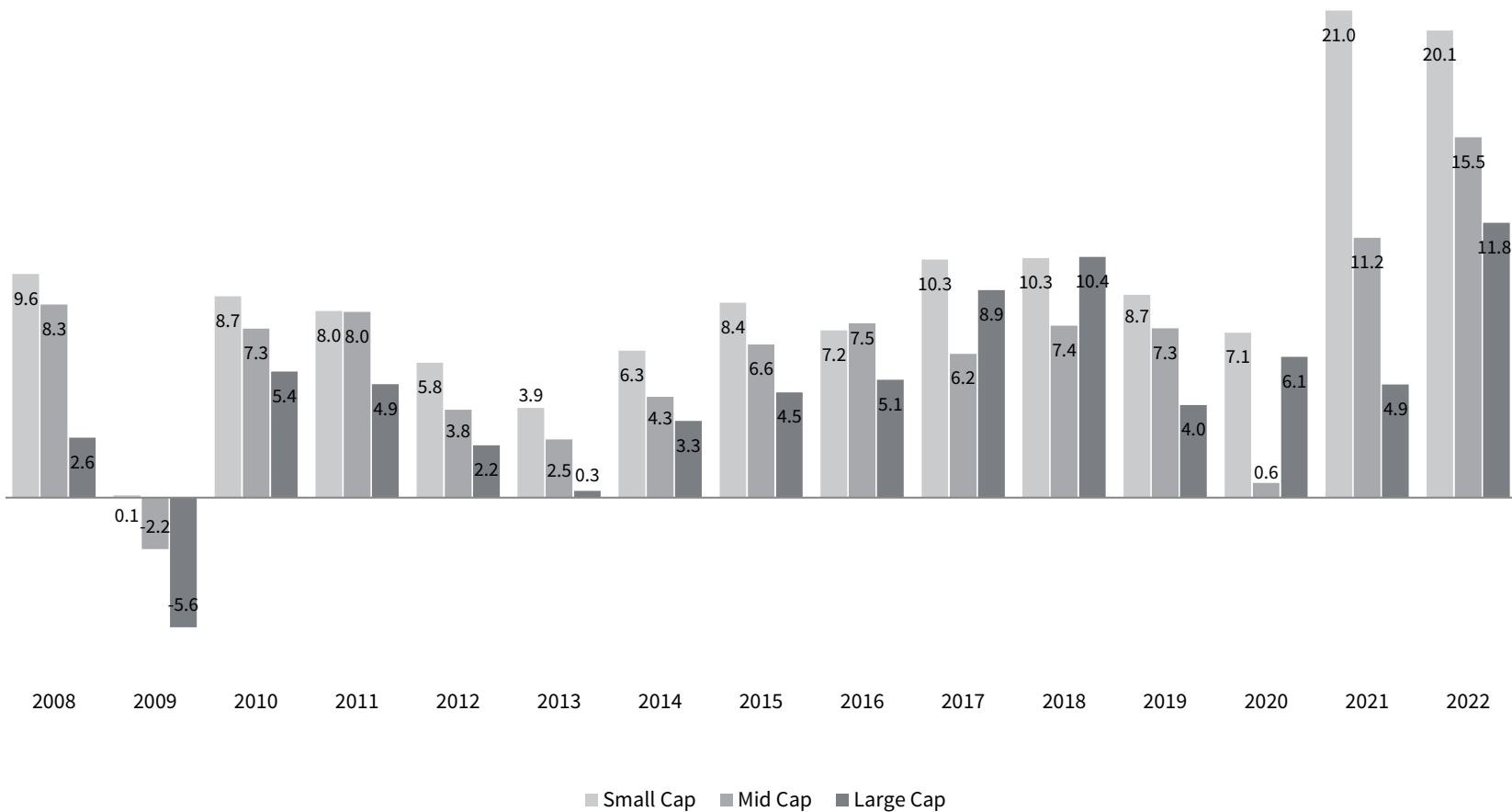


Revenue growth was strong across all buyout size groups in 2022

Mid- and large-cap companies each set records for the period

AVERAGE ANNUAL REVENUE GROWTH OF EUROPEAN PRIVATE EQUITY BUYOUT COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • Annual Growth Rate (%)



EUROPEAN PRIVATE EQUITY ANALYSIS

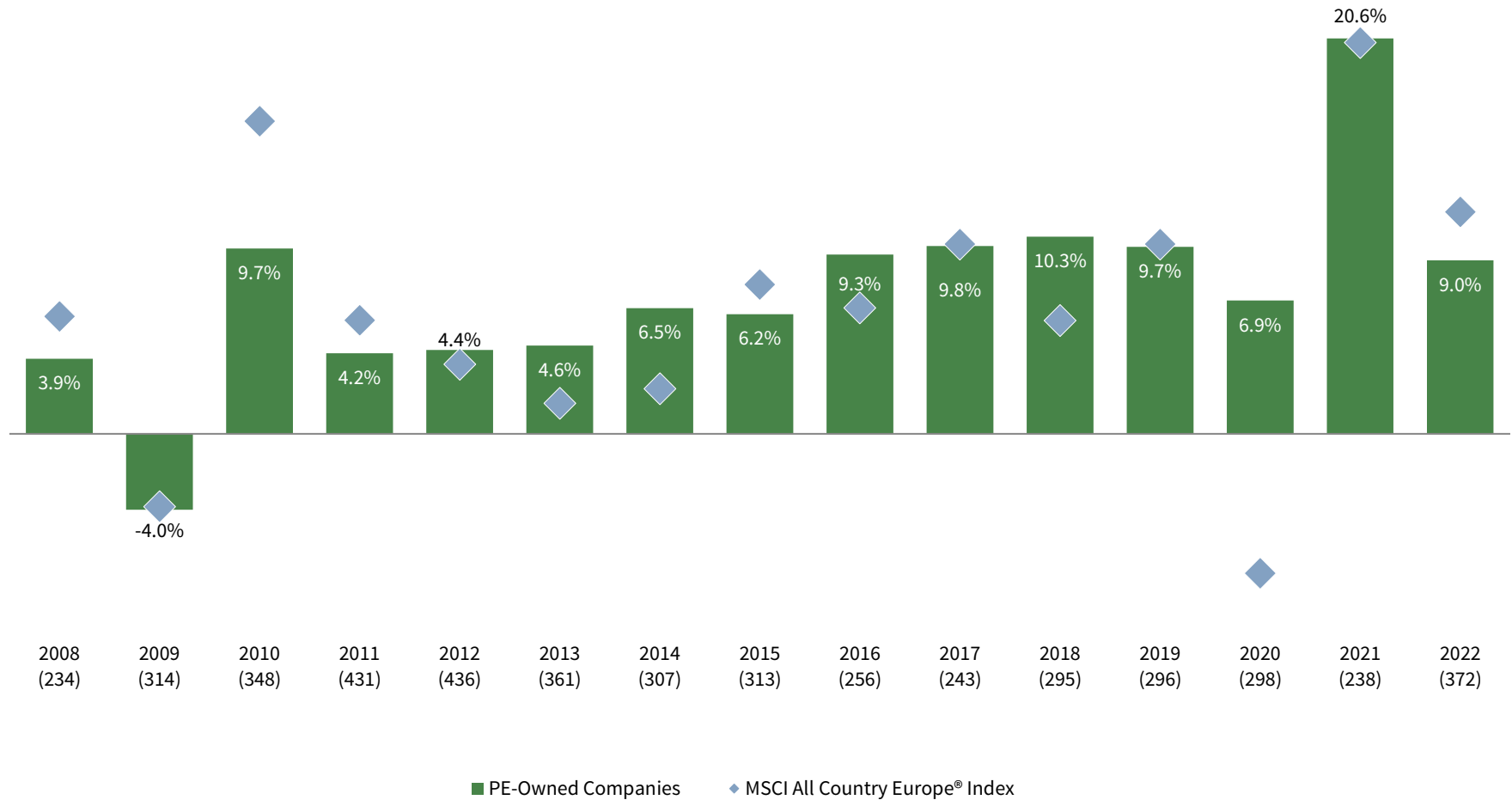
- Purchase Price Multiple
- Leverage Multiple
- Revenue Growth
- **EBITDA Growth**
- EBITDA Margin
- Exit Metrics

Amid rising interest rates and inflation, EBITDA growth declined sharply from the prior year for European PE and public companies

PE companies have tended to grow EBITDA faster than publics, but underperformed in 2022 by the largest amount since 2010

AVERAGE ANNUAL EBITDA GROWTH OF EUROPEAN PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

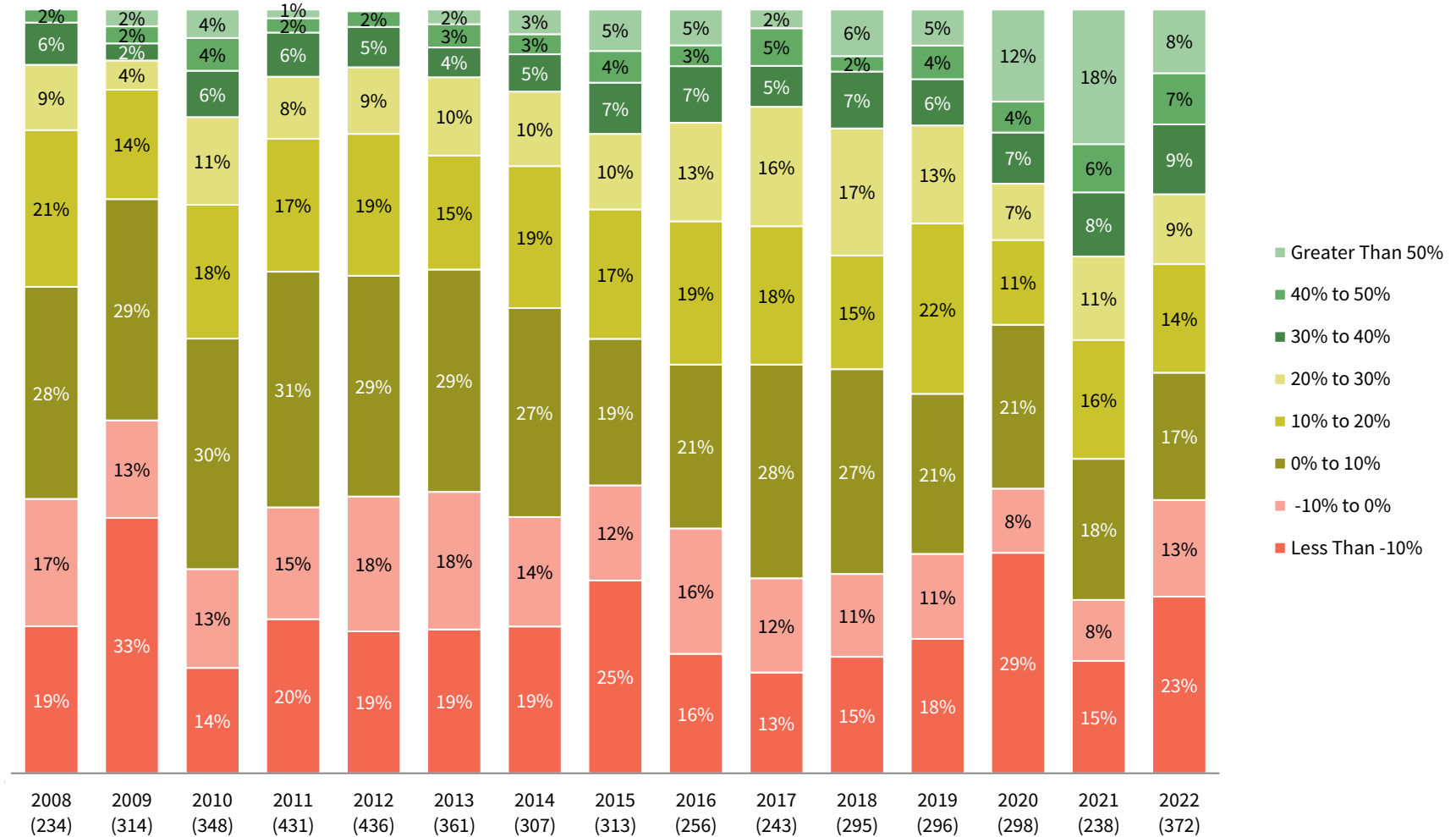


About 36% of companies suffered EBITDA declines in 2022, similar to 2020 when the COVID-19 pandemic dampened growth

Over the long term, just 5% of companies grew EBITDA by more than 50%, which could reflect the buyout tilt in the European PE sample

AVERAGE ANNUAL EBITDA GROWTH BREAKDOWN OF EUROPEAN PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

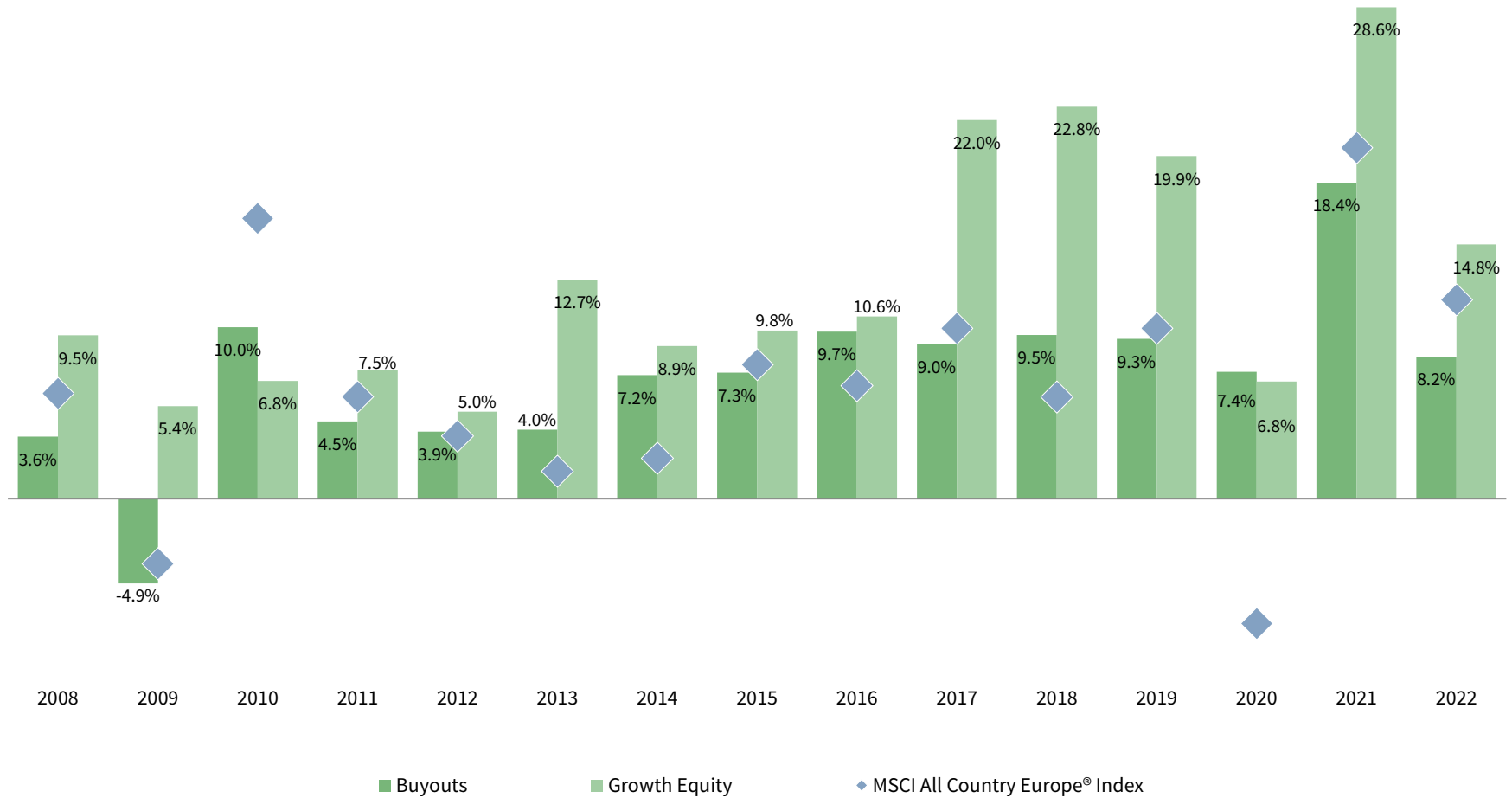


In 2022, EBITDA growth was more in line with long-term averages: 12.7% (growth equity), 6.4% (buyouts), and 6.1% (public)

The year-over-year decrease from 2021 to 2022 was the worst recorded over the period for buyouts and growth equity

AVERAGE ANNUAL EBITDA GROWTH OF EUROPEAN BUYOUT AND GROWTH EQUITY COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

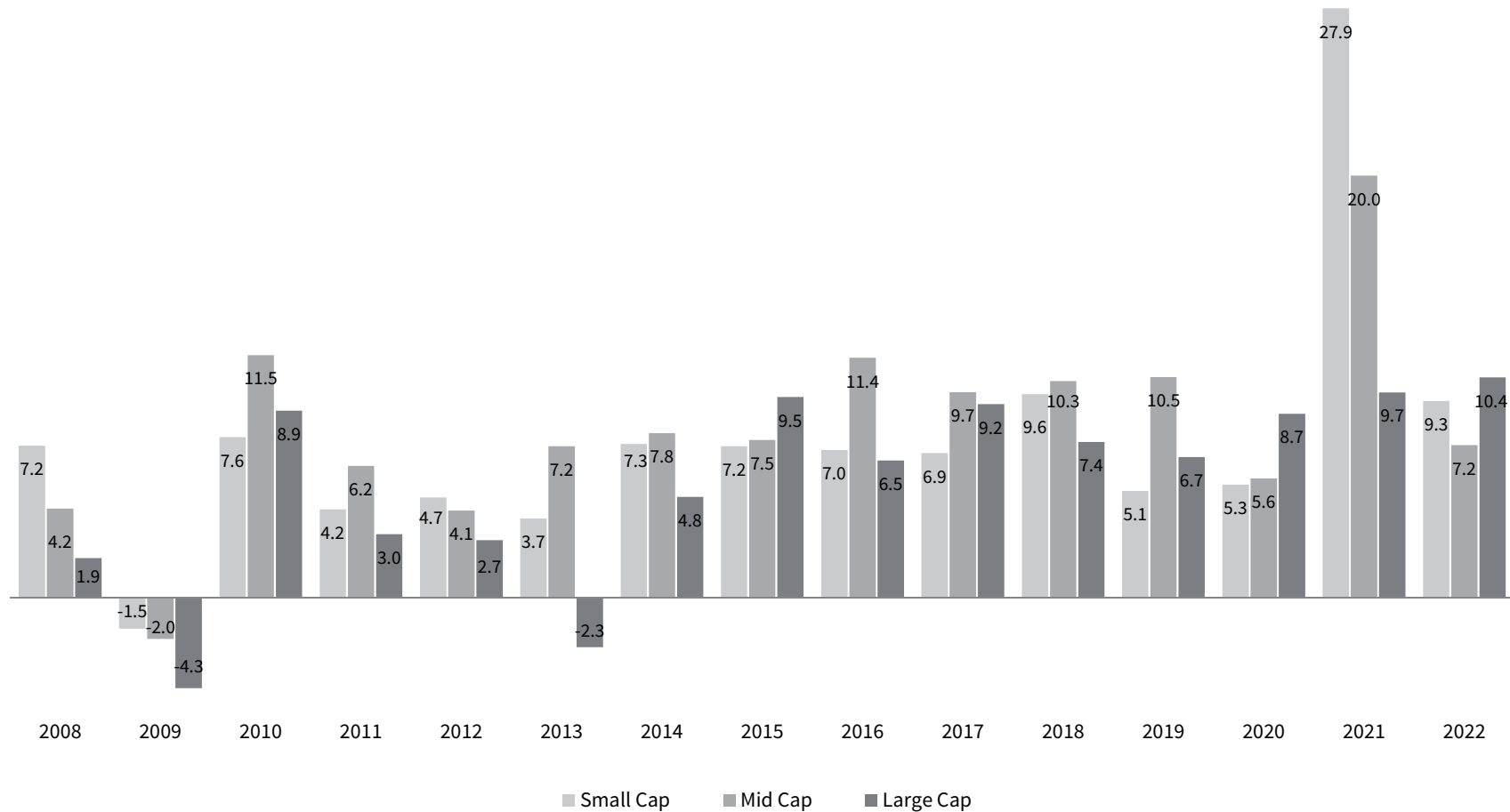


Though in line with long-term averages, small- and mid-cap buyout revenue growth in 2022 was a fraction of what it was in 2021

Large companies, on the other hand, were more profitable and achieved record EBITDA growth over the period

AVERAGE ANNUAL EBITDA GROWTH OF EUROPEAN PRIVATE EQUITY BUYOUT COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • Annual Growth Rate (%)



EUROPEAN PRIVATE EQUITY ANALYSIS

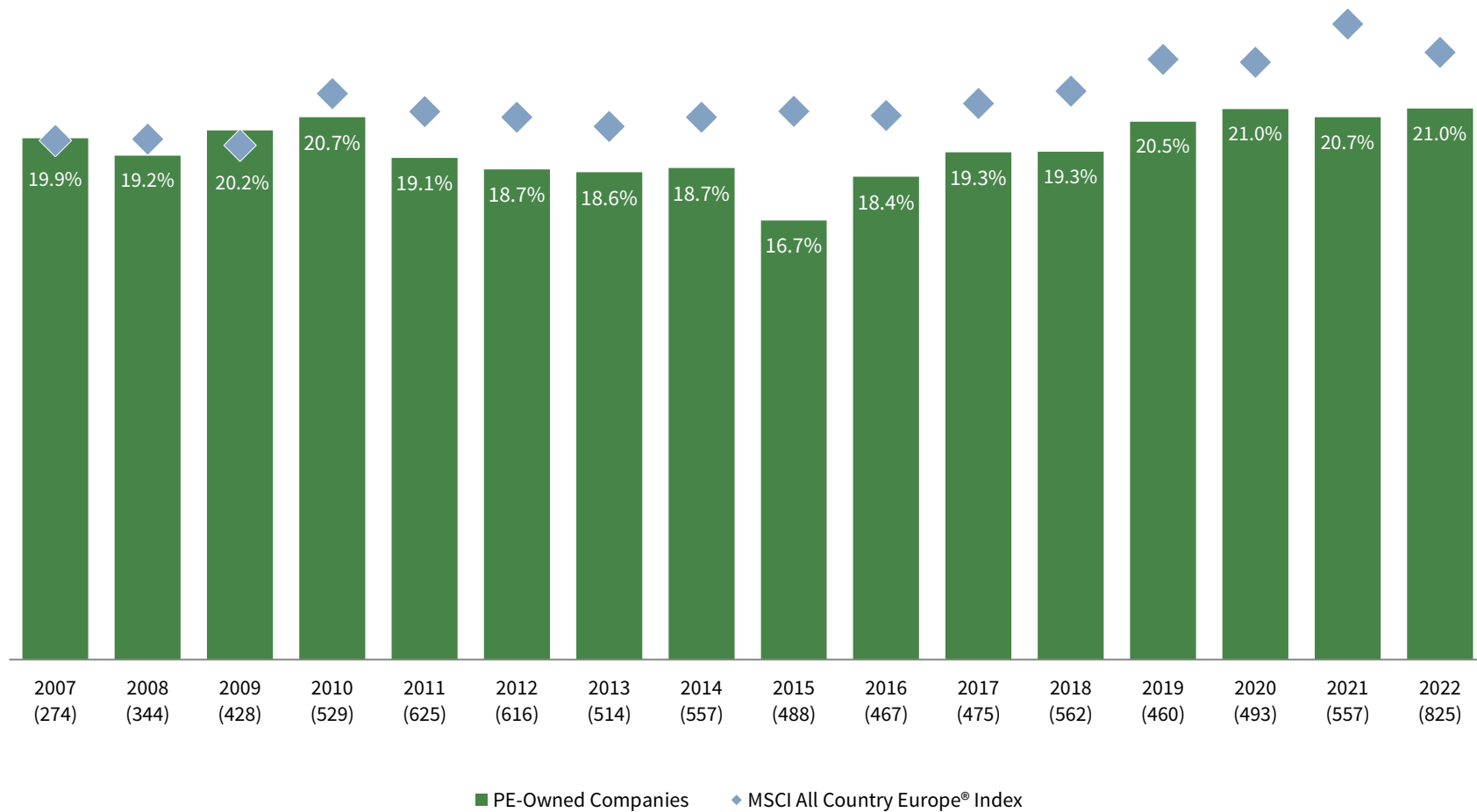
- Purchase Price Multiple
- Leverage Multiple
- Revenue Growth
- EBITDA Growth
- **EBITDA Margin**
- Exit Metrics

PE-backed European companies have operated at margins above 20% for the last four years

Between the two samples, public companies have averaged better margins in the post-GFC period

AVERAGE ANNUAL EBITDA MARGIN OF EUROPEAN PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • EBITDA/Revenue (%)

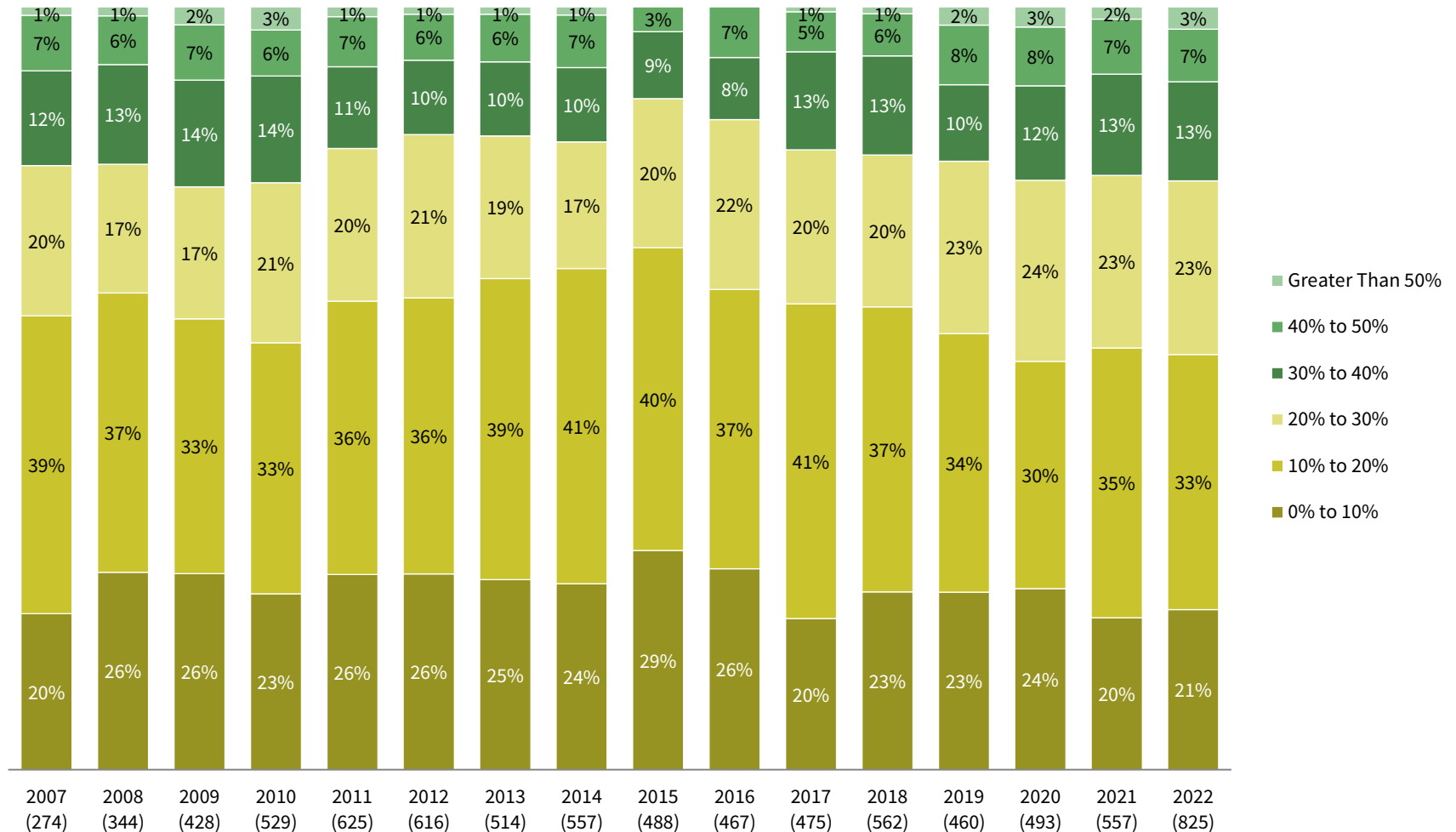


The distribution of operating margins has been consistent over the long term

On average, most operated at margins between 10% and 30%

AVERAGE ANNUAL EBITDA MARGIN BREAKDOWN OF EUROPEAN PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • EBITDA/Revenue (%)

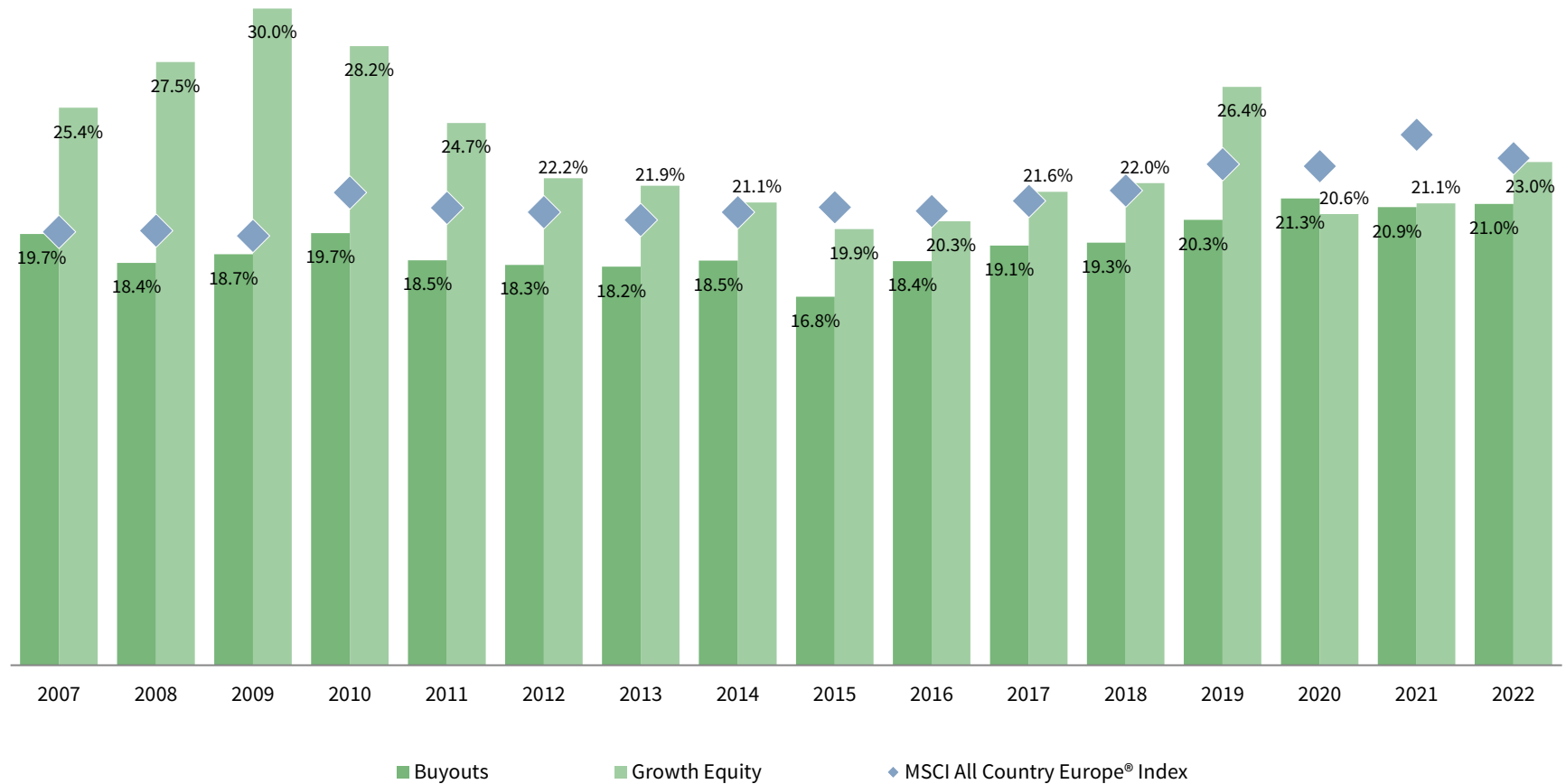


Buyout and growth equity companies in Europe operated at similar EBITDA margins in 2020–22

In 2022, they were in line with public company margins

AVERAGE ANNUAL EBITDA MARGIN OF EUROPEAN BUYOUT AND GROWTH EQUITY COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • EBITDA/Revenue (%)

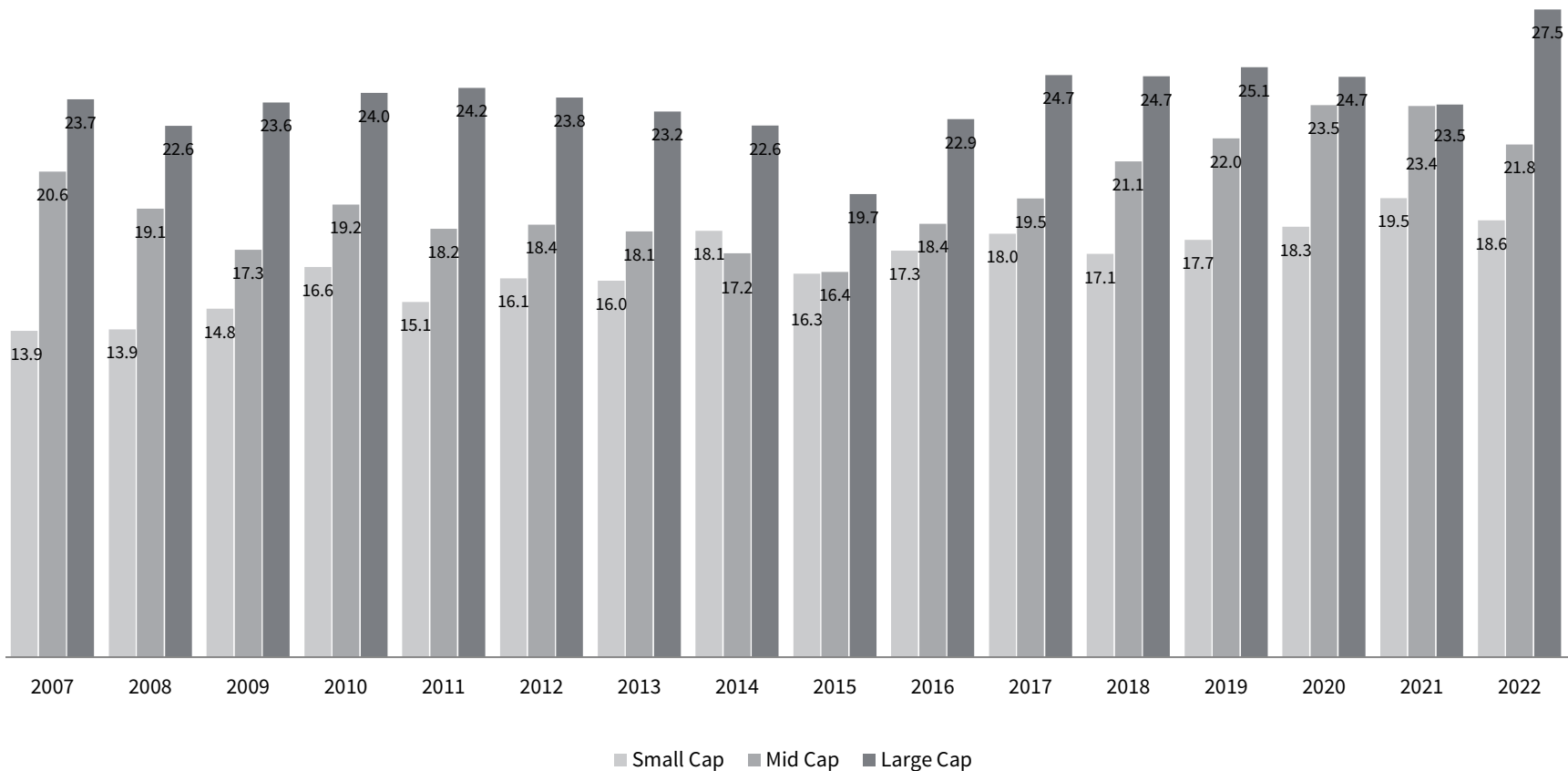


In 2022, large buyouts operated at their highest margins over the full time period

Margins for mid- and small-cap buyouts decreased from the prior year but remained above their historical averages

AVERAGE ANNUAL EBITDA MARGIN OF EUROPEAN PRIVATE EQUITY BUYOUT COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • EBITDA/Revenue (%)



EUROPEAN PRIVATE EQUITY ANALYSIS

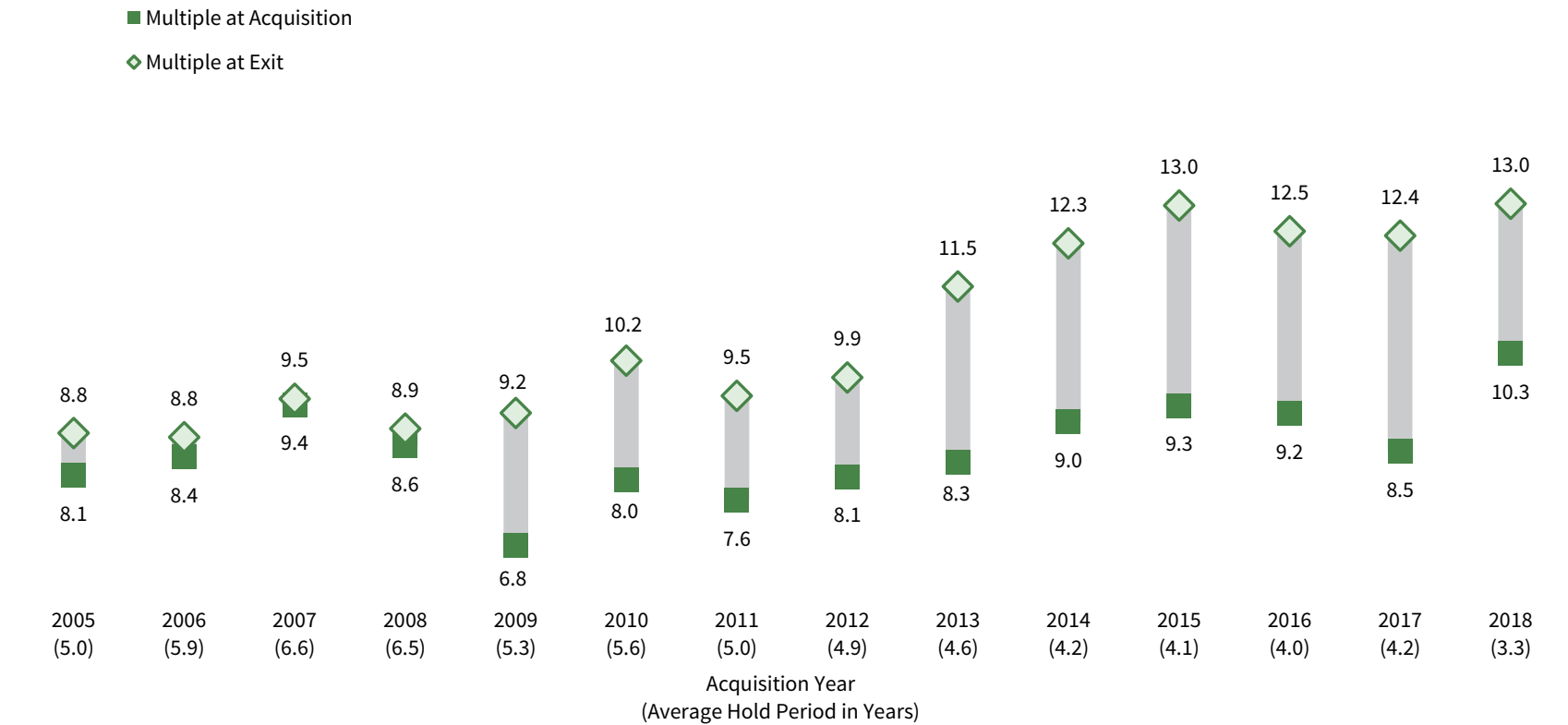
- Purchase Price Multiple
- Leverage Multiple
- Revenue Growth
- EBITDA Growth
- EBITDA Margin
- **Exit Metrics**

Realized companies acquired in 2018 had the highest EBITDA PPMs at acquisition and exit over the full period

Multiple expansion was only 2.7x, however, marking the lowest amount since 2012

MEDIAN EBITDA MULTIPLE EXPANSION OF EXITED EUROPEAN PRIVATE EQUITY-OWNED COMPANIES BY ACQUISITION YEAR

As of December 31, 2022 • Enterprise Value/EBITDA



	Number of Companies														
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
PE-Owned Companies	103	149	139	107	54	121	103	77	79	90	79	61	42	37	



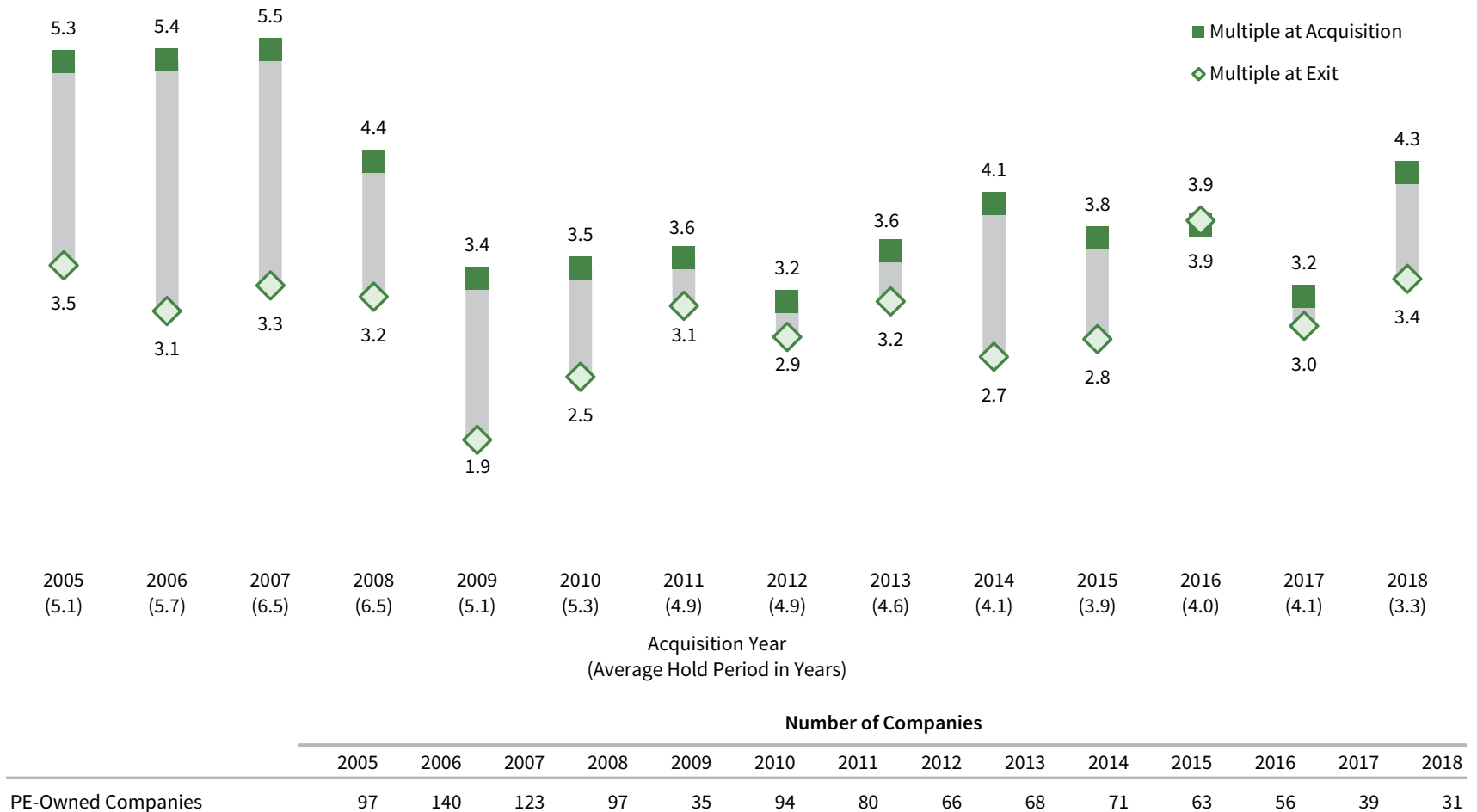
Source: Cambridge Associates LLC Private Investments Database (as reported by investment managers).
 Note: All companies with negative EBITDA and negative enterprise value were excluded from the analysis.

Leverage multiples for realized companies in nine of the 14 acquisition years were at least one turn lower at exit

Across the full period, the median leverage multiple at exit was 3.1x

MEDIAN EBITDA LEVERAGE MULTIPLE COMPRESSION OF EUROPEAN PRIVATE EQUITY-OWNED COMPANIES BY ACQUISITION YEAR

As of December 31, 2022 • Net Debt/EBITDA

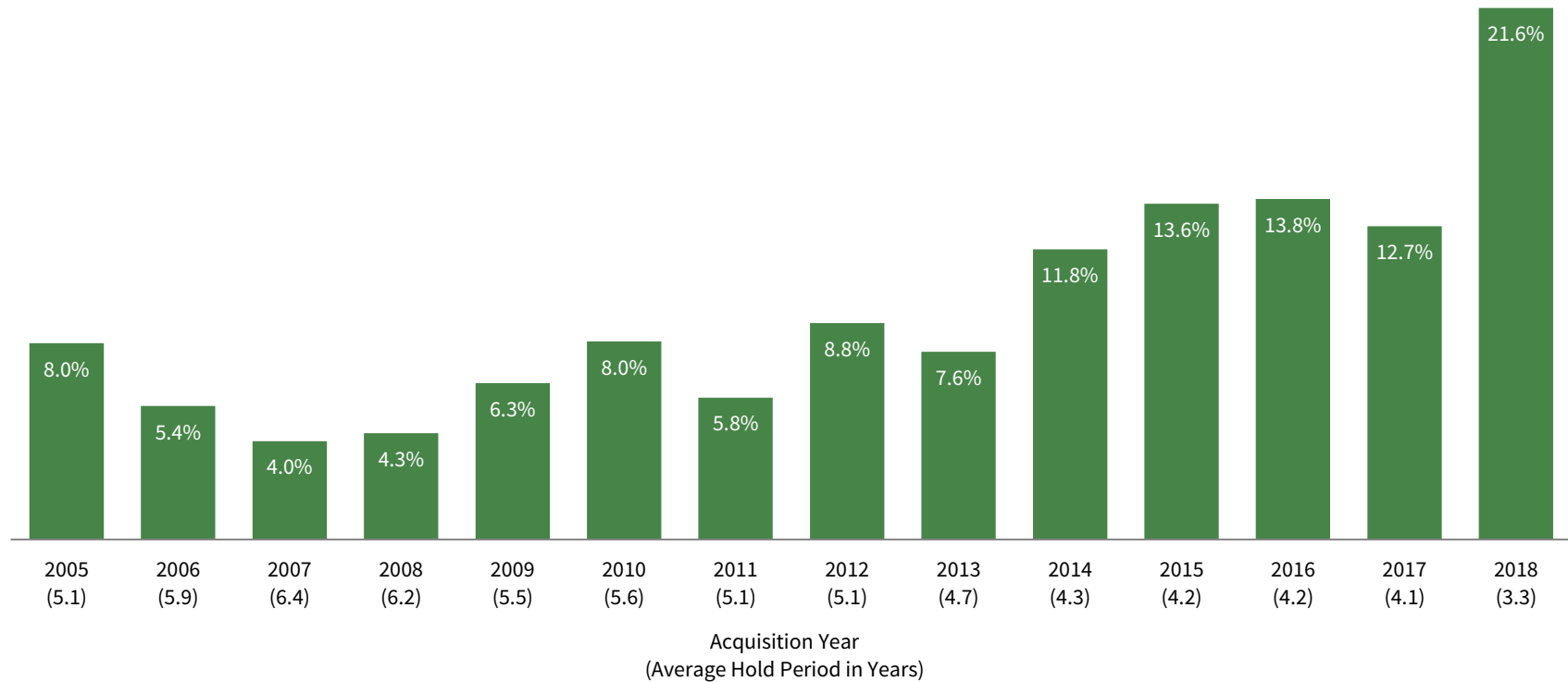


The median revenue CAGR was 6.2% for the first nine acquisition years analyzed and 13.2% for the most recent five years

For realized companies acquired in 2018, the median revenue CAGR was nearly 9% higher than the previous year

MEDIAN REVENUE CAGR OF EXITED EUROPEAN PRIVATE EQUITY-OWNED COMPANIES BY ACQUISITION YEAR

As of December 31, 2022 • Compound Annual Growth Rate (%)



Number of Companies

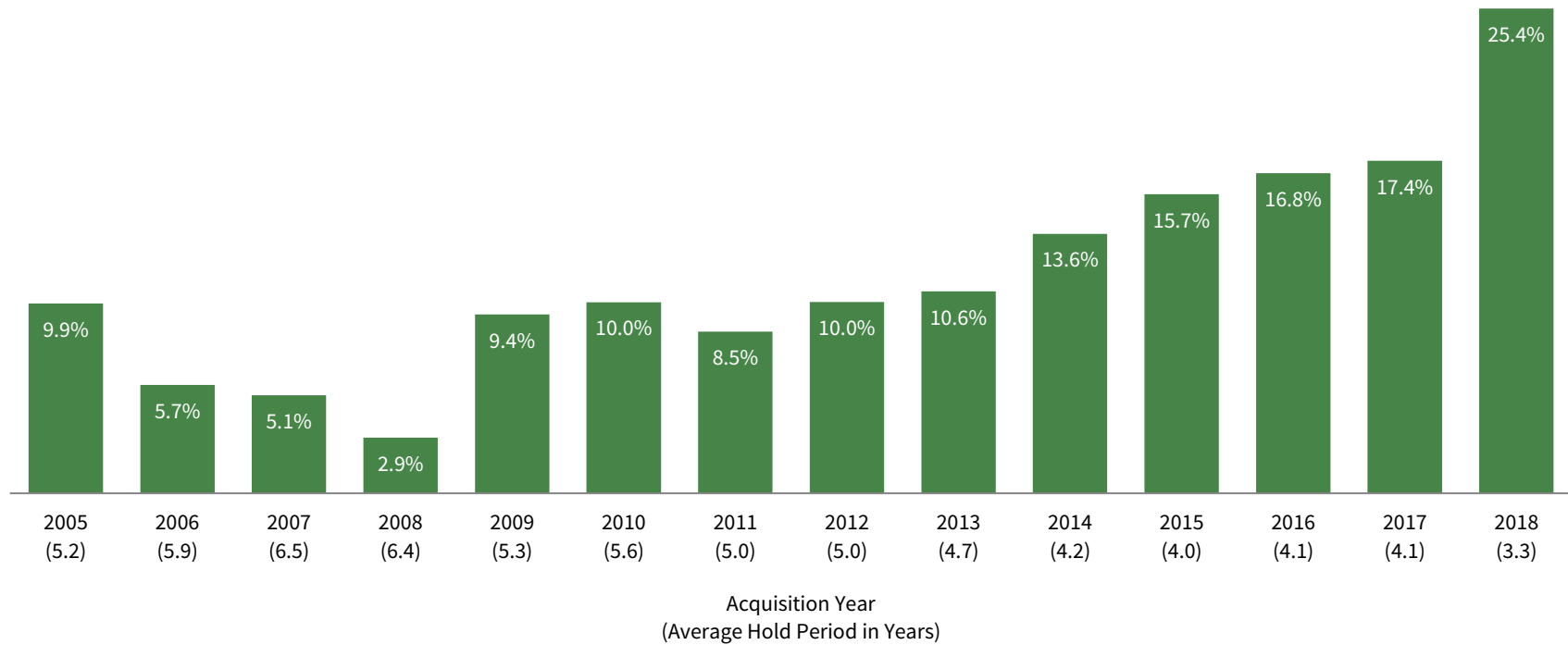
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
PE-Owned Companies	117	156	160	116	57	129	111	88	87	99	93	70	48	41

Since the GFC, realized PE-backed companies had median EBITDA CAGRs above 10% for every acquisition year except for 2011

EBITDA CAGRs spiked for realized companies acquired in 2018, supporting the notion that fast-growing companies are sold more quickly, particularly those sold into the post-pandemic bull market

MEDIAN EBITDA CAGR OF EXITED EUROPEAN PRIVATE EQUITY-OWNED COMPANIES BY ACQUISITION YEAR

As of December 31, 2022 • Compound Annual Growth Rate (%)



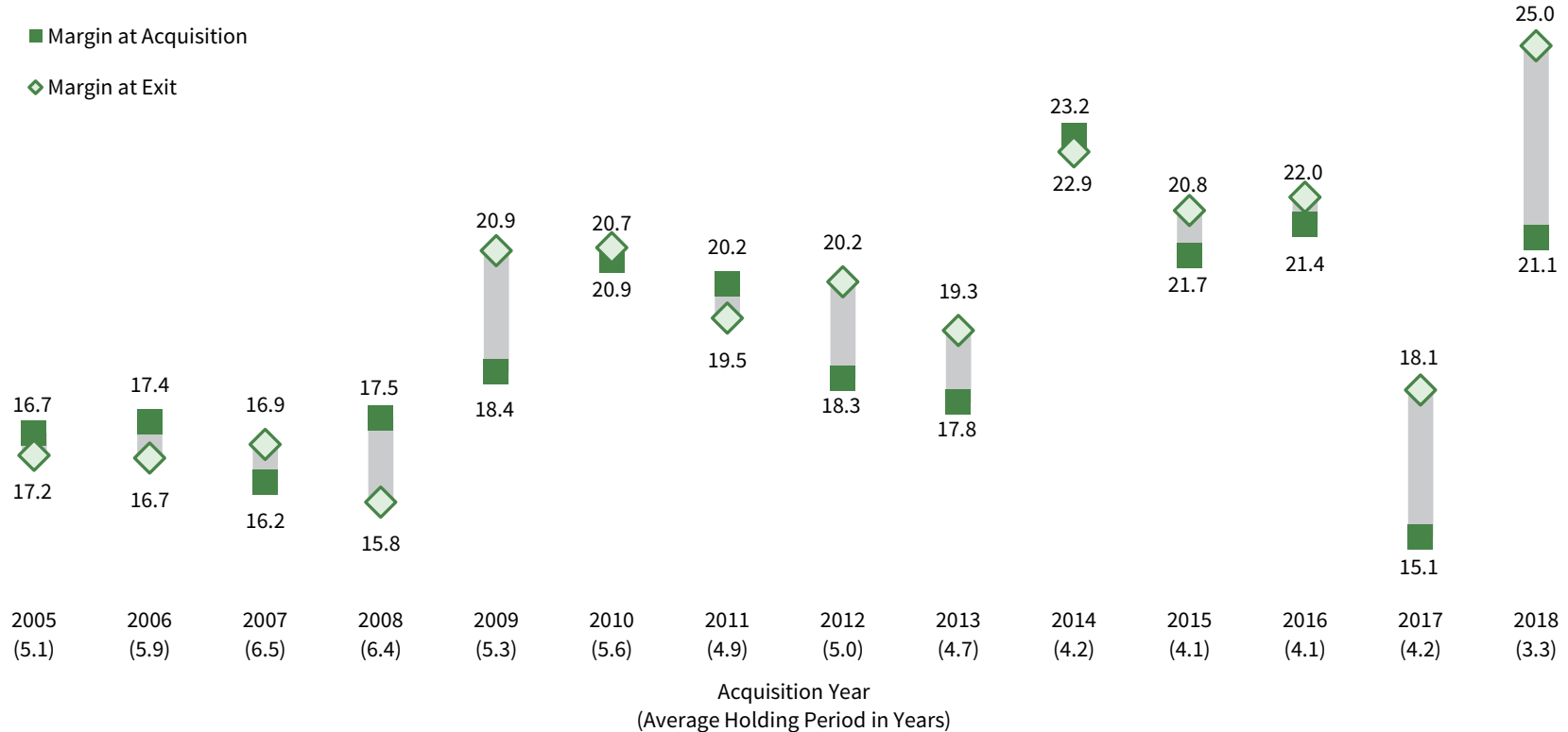
	Number of Companies														
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
PE-Owned Companies	112	153	152	116	55	123	105	80	83	91	81	64	44	37	

Median EBITDA margin at exit reached a sample-wide high for companies acquired in 2018

Median EBITDA margin at acquisition reached a sample-wide low in 2017

MEDIAN EBITDA MARGIN EXPANSION OF EXITED EUROPEAN PRIVATE EQUITY-OWNED COMPANIES BY ACQUISITION YEAR

As of December 31, 2022 • EBITDA/Revenue (%)



Number of Companies

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
PE-Owned Companies	108	147	147	104	52	120	100	78	81	89	82	65	43	36

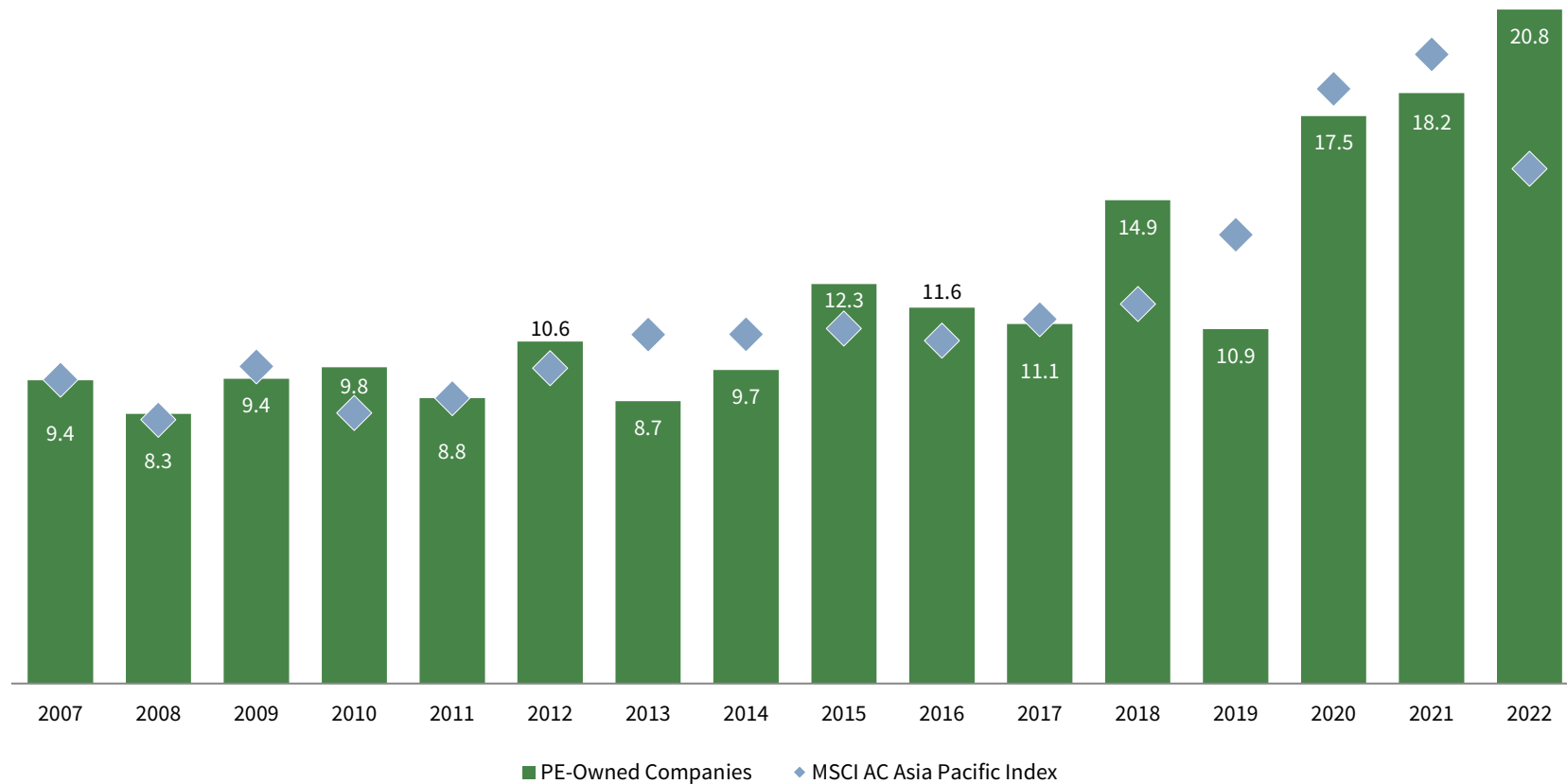
ASIAN PRIVATE EQUITY ANALYSIS

In 2022, PE PPMs hit an all-time period high, albeit in a slower market

Public valuations dropped more than three turns from the prior year after increasing steadily since 2010

AVERAGE EBITDA PURCHASE PRICE MULTIPLES AT ACQUISITION OF ASIAN PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Enterprise Value/EBITDA

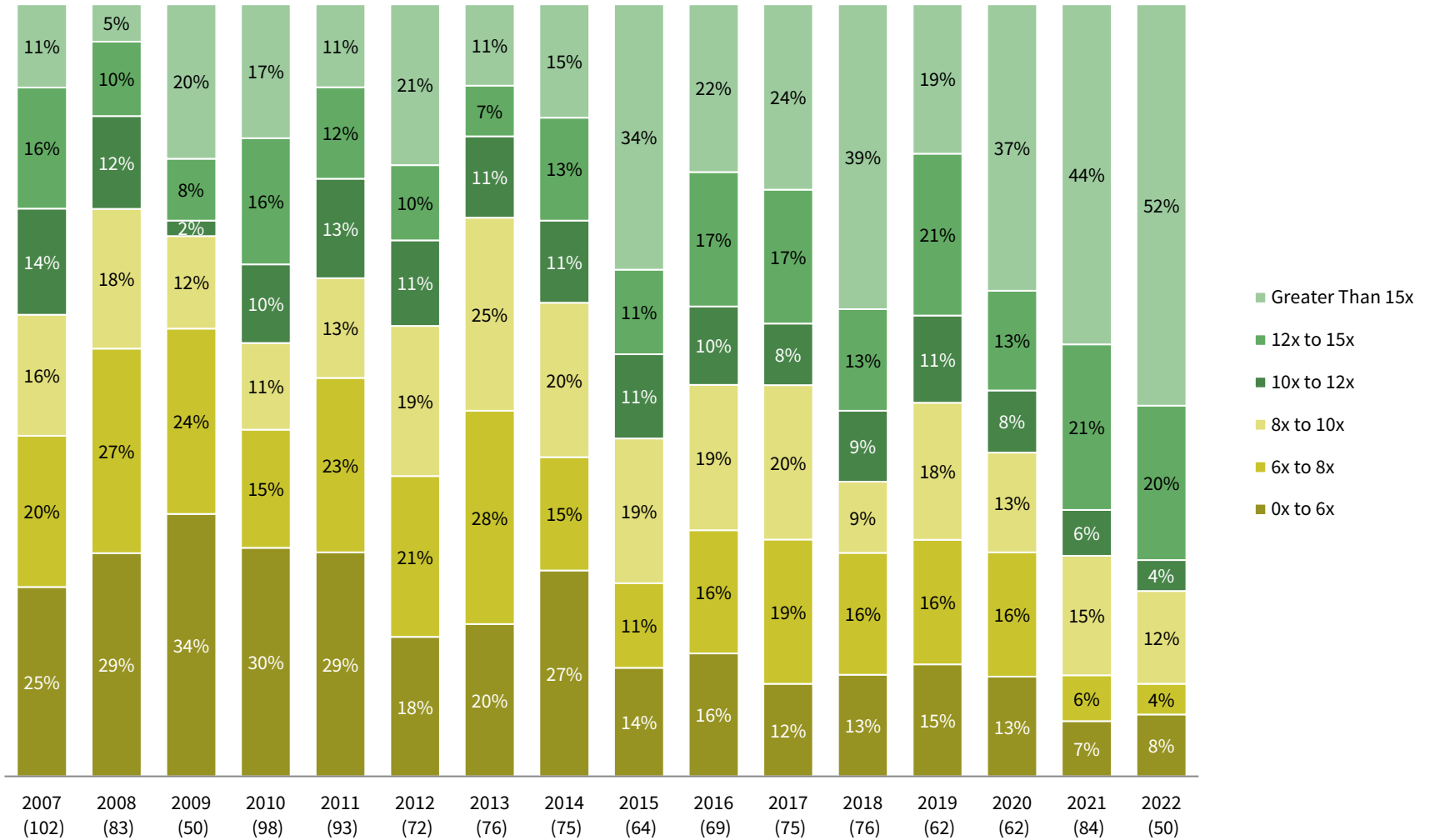


More than half of 2022's deals transacted at PPMs of greater than 15x

Since 2007, only a quarter transacted at those levels

AVERAGE EBITDA PURCHASE PRICE MULTIPLE BREAKDOWN OF ASIAN PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Enterprise Value/EBITDA

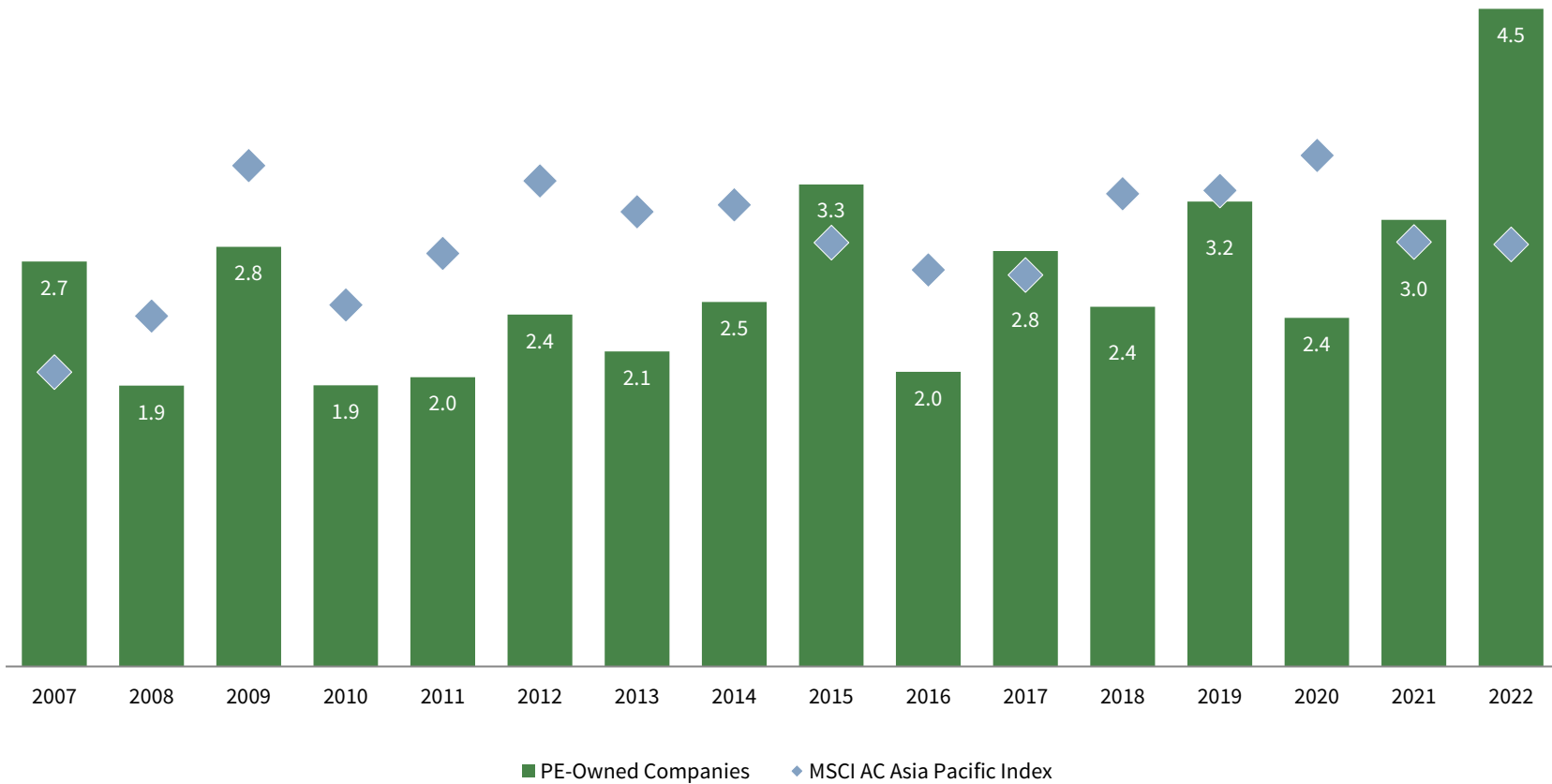


PE leverage multiples hit new heights in 2022

It is worth noting that the 2022 sample is dominated by buyouts in contrast to historical norms

AVERAGE EBITDA LEVERAGE MULTIPLES AT ACQUISITION OF ASIAN PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Net Debt/EBITDA

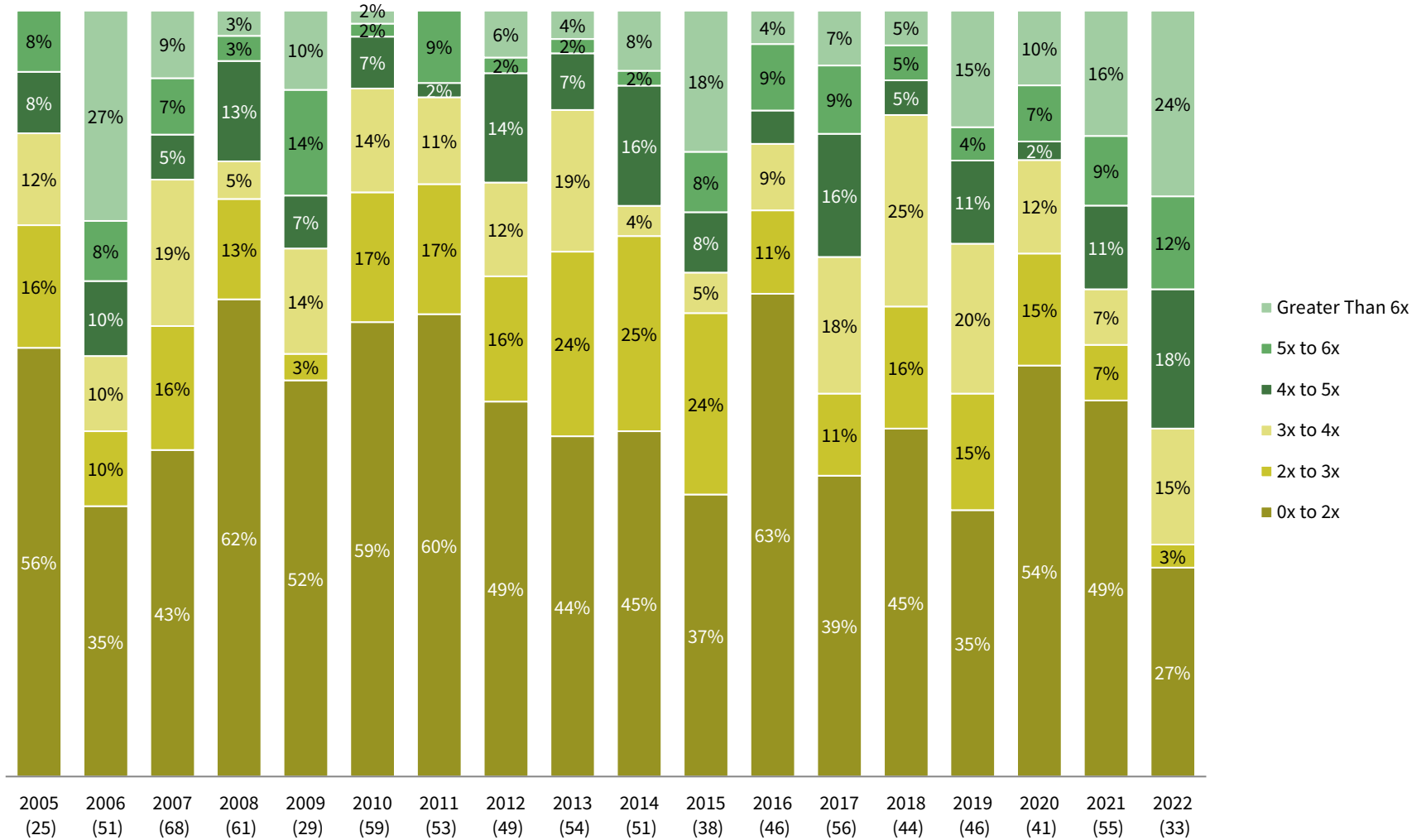


In 2022, the highest percentage of deals over the period were levered at 4x or greater, in line with the buyout tilt in the sample

In prior years, the high percentage of companies acquired with little to no leverage reflects the usual growth equity bias in the sample

LEVERAGE MULTIPLE BREAKDOWN OF ASIAN PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Net Debt/EBITDA

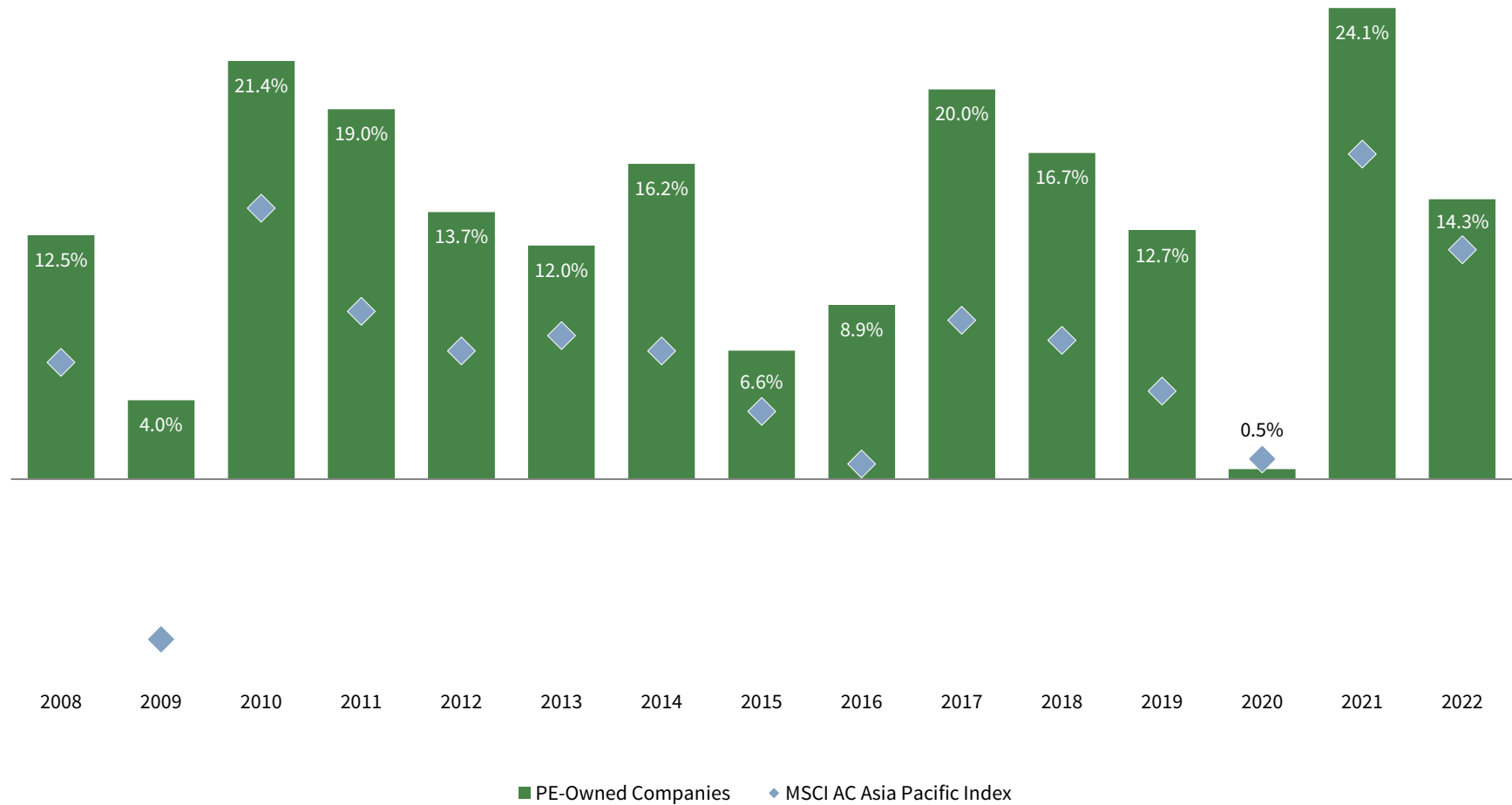


Active PE companies grew revenue in 2022 near the long-term average of 13.4%

Prior to 2022, COVID-era revenue growth was volatile in both PE and public universes

AVERAGE ANNUAL REVENUE GROWTH OF ASIAN PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

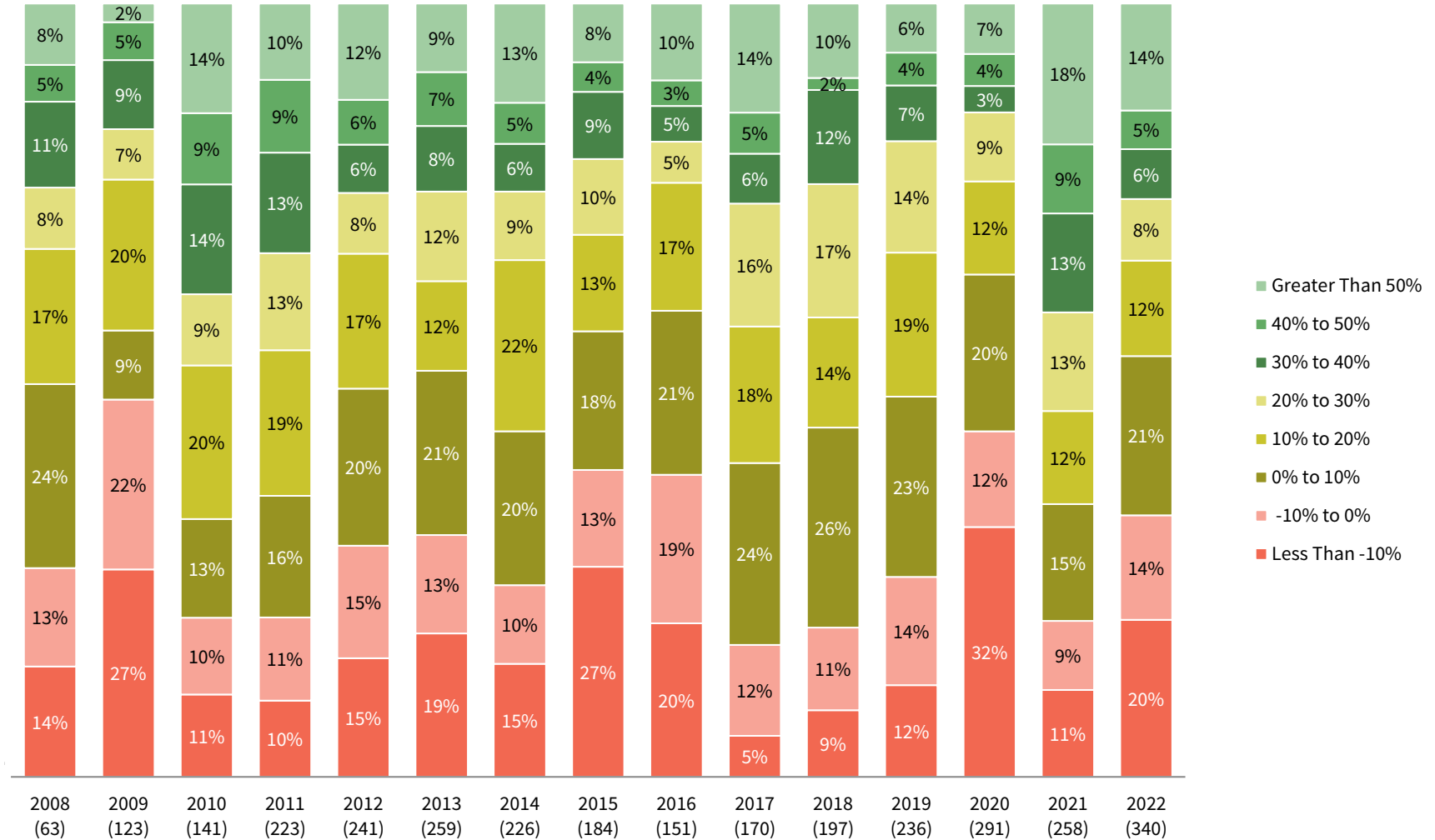


Post-GFC, roughly the same percentage of companies grew revenue by at least 30% and experienced revenue decline

2022 was one of just five years when revenue declined for more than one-third of the sample

ANNUAL REVENUE GROWTH BREAKDOWN OF ASIAN PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)



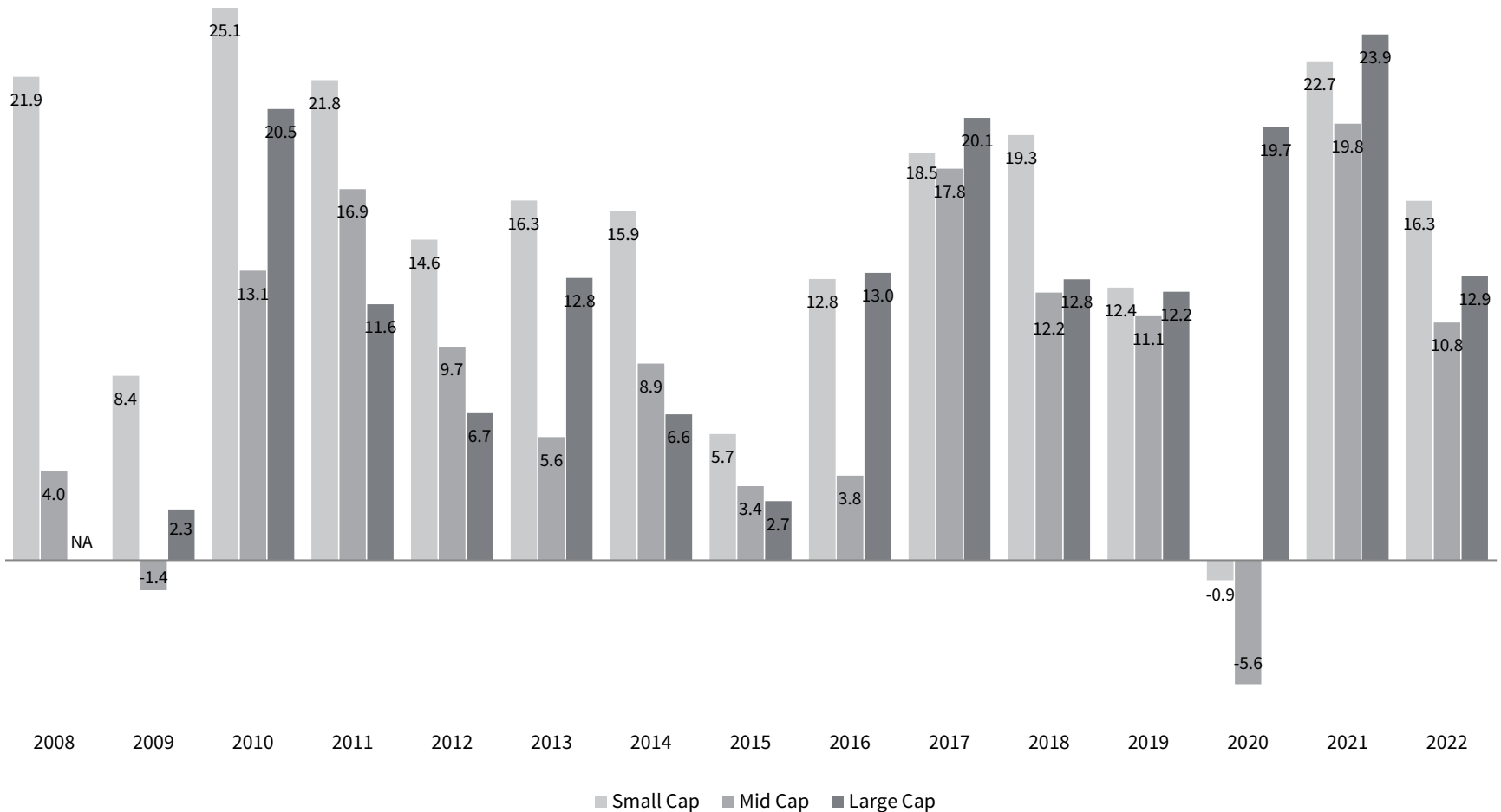
Source: Cambridge Associates LLC Private Investments Database (as reported by investment managers).
 Notes: Outliers were identified and excluded. Numbers in parentheses represent total private companies in a year. Each range includes the lower bound value. For example, the "0% to 10%" range includes companies with reported growth of exactly 0%. Due to rounding, totals may not sum to 100%.

During 2022, small companies grew revenue fastest among the size ranges for the first time since 2019

While companies in all size segments averaged faster revenue growth than long-term norms, mid-cap companies exceeded theirs by the widest margin

AVERAGE ANNUAL REVENUE GROWTH OF ASIAN PRIVATE EQUITY-OWNED COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • Annual Growth Rate (%)

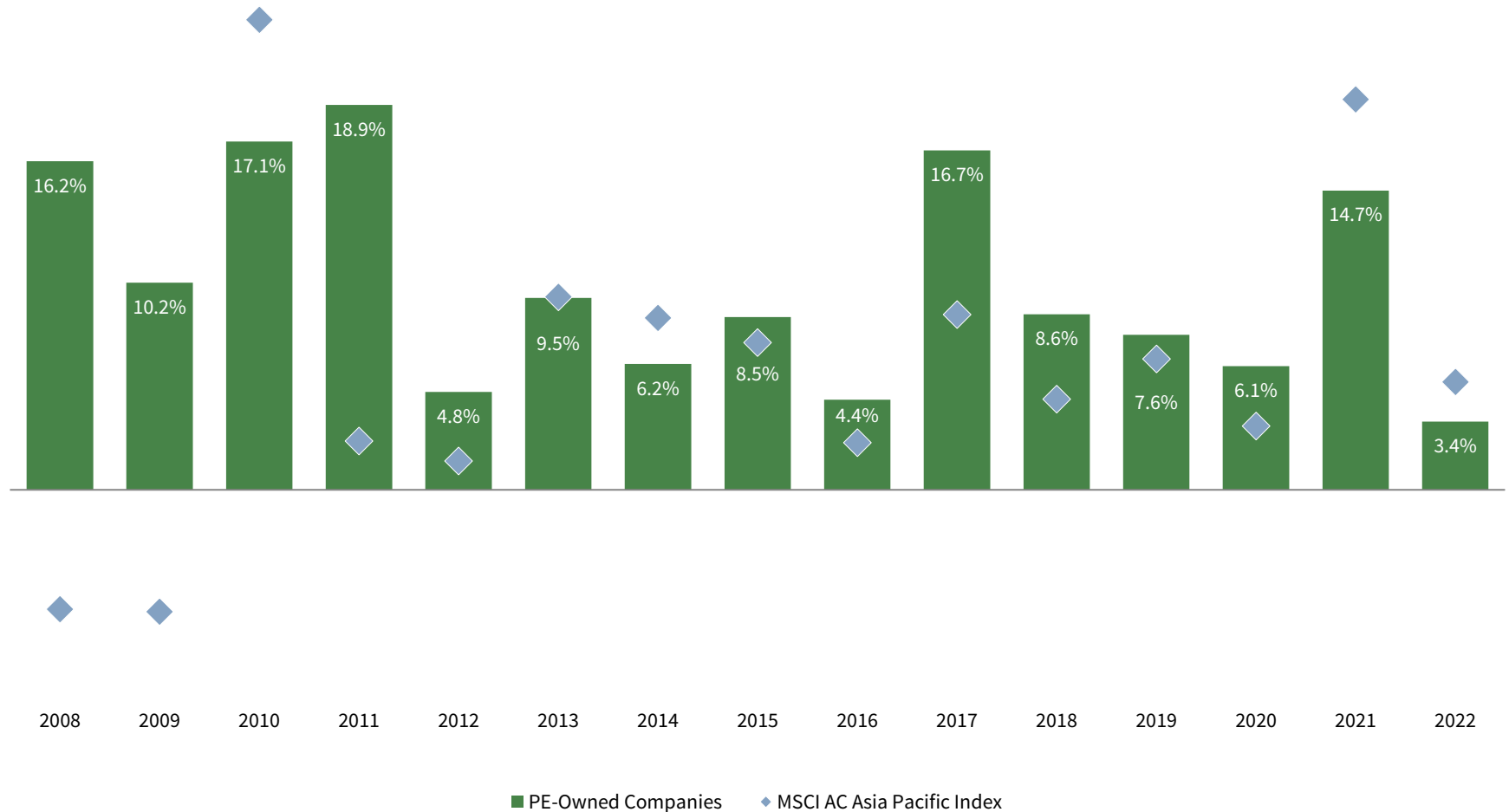


PE-backed companies averaged the lowest EBITDA growth of any year in the sample in 2022

And trailed public counterparts for only the fourth time in 15 years

AVERAGE ANNUAL EBITDA GROWTH OF ASIAN PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)

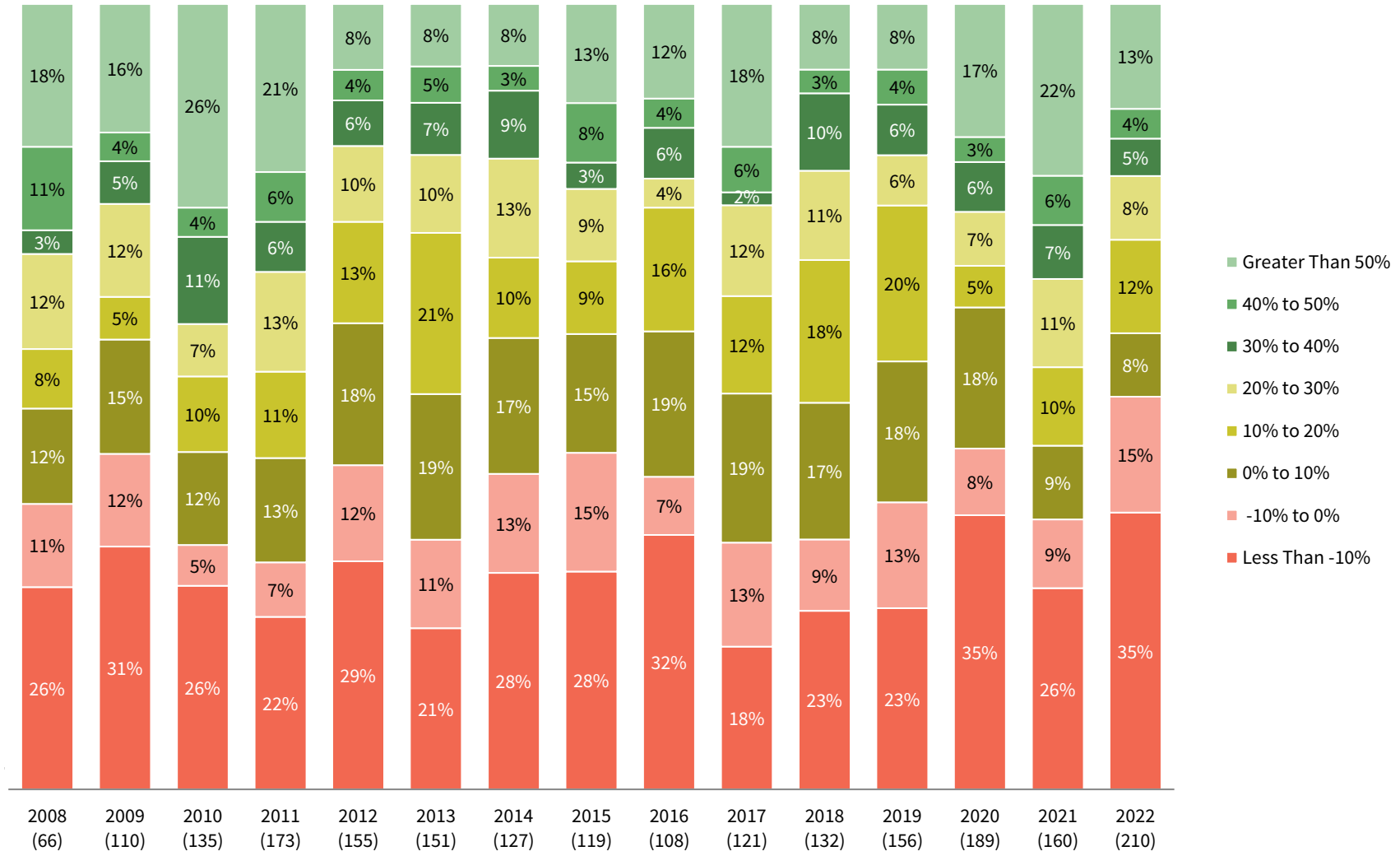


EBITDA declined for half of the PE universe in 2022, the highest percentage of any year in the sample

But the percentage of companies that grew EBITDA by at least 30% was just below the long-term average

AVERAGE ANNUAL EBITDA GROWTH BREAKDOWN OF ASIAN PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • Annual Growth Rate (%)



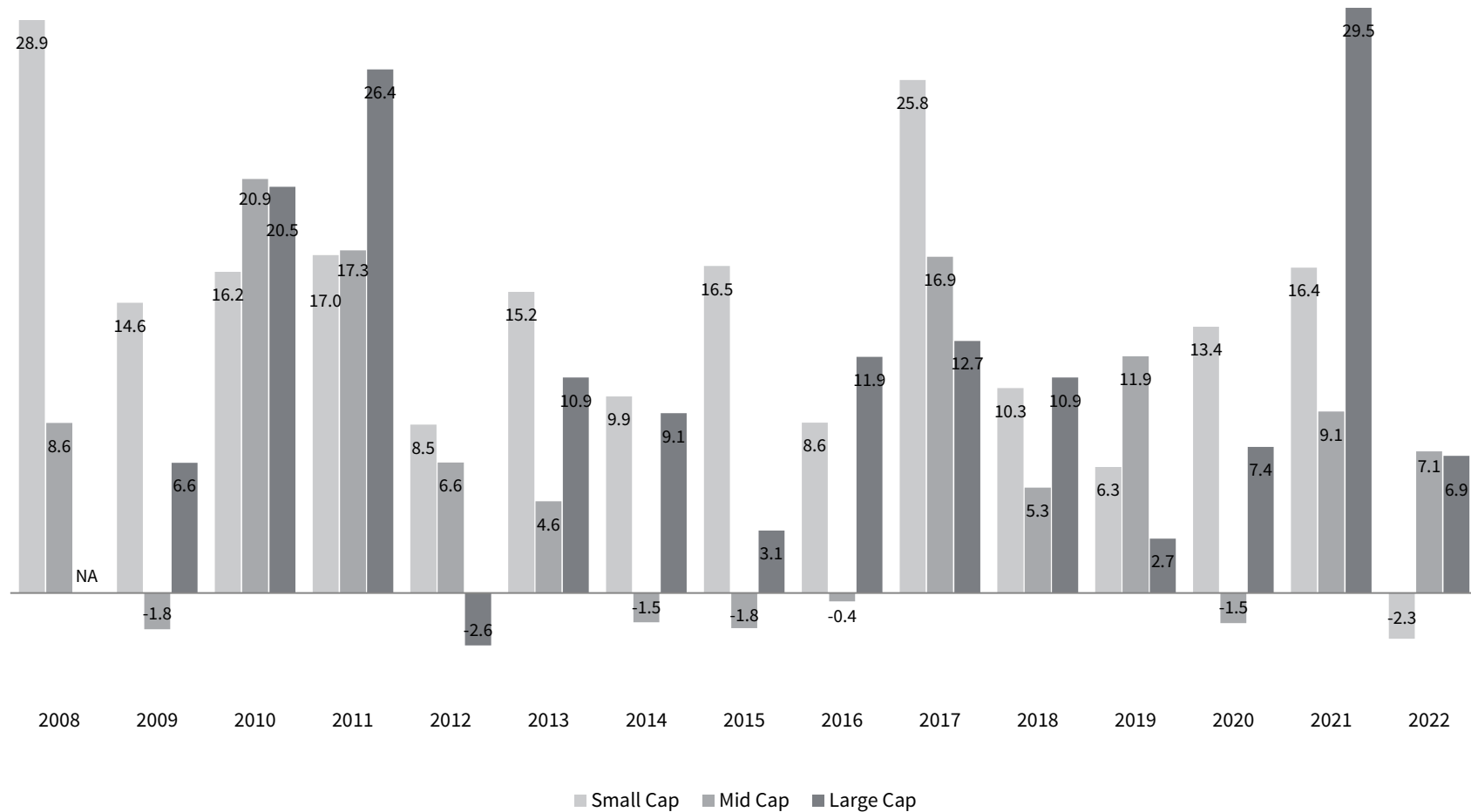
Source: Cambridge Associates LLC Private Investments Database (as reported by investment managers).
 Notes: Outliers were identified and excluded. Numbers in parentheses represent total private companies in a year. Each range includes the lower bound value. For example, the "0% to 10%" range includes companies with reported growth of exactly 0%. Due to rounding, totals may not sum to 100%.

Small companies averaged the worst EBITDA growth of any year in the sample in 2022

Over the full time period, however, small companies averaged the highest annual EBITDA growth than any of the size segments

AVERAGE ANNUAL EBITDA GROWTH OF ASIAN PRIVATE EQUITY-OWNED COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • Annual Growth Rate (%)

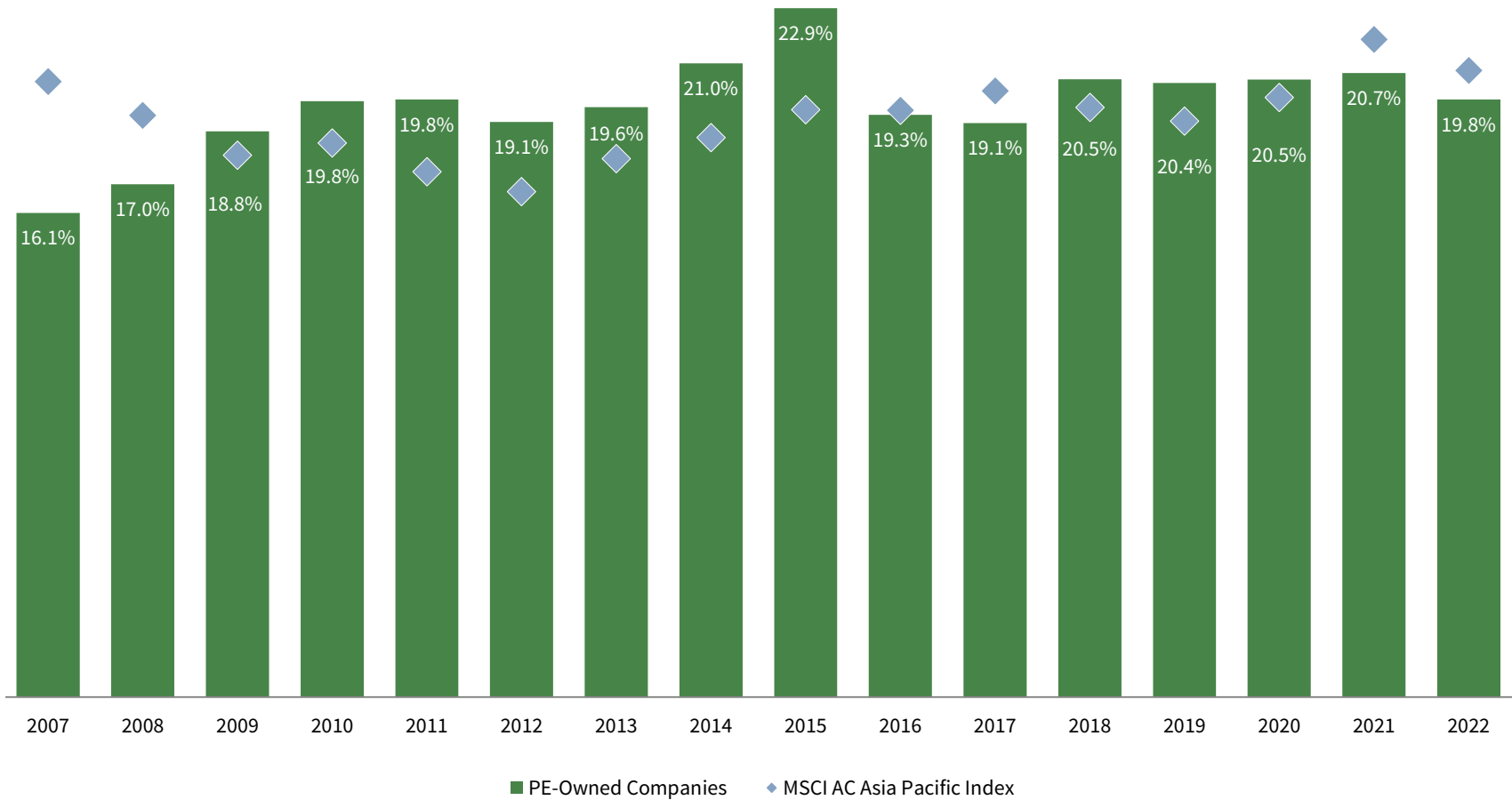


Over the full time period, PE companies operated at the same or higher EBITDA margins than public peers in all but five years analyzed

But in 2021 and 2022, EBITDA margins were higher for public companies

AVERAGE ANNUAL EBITDA MARGIN OF ASIAN PRIVATE EQUITY-OWNED COMPANIES VS PUBLIC COMPANIES

As of December 31, 2022 • EBITDA/Revenue (%)

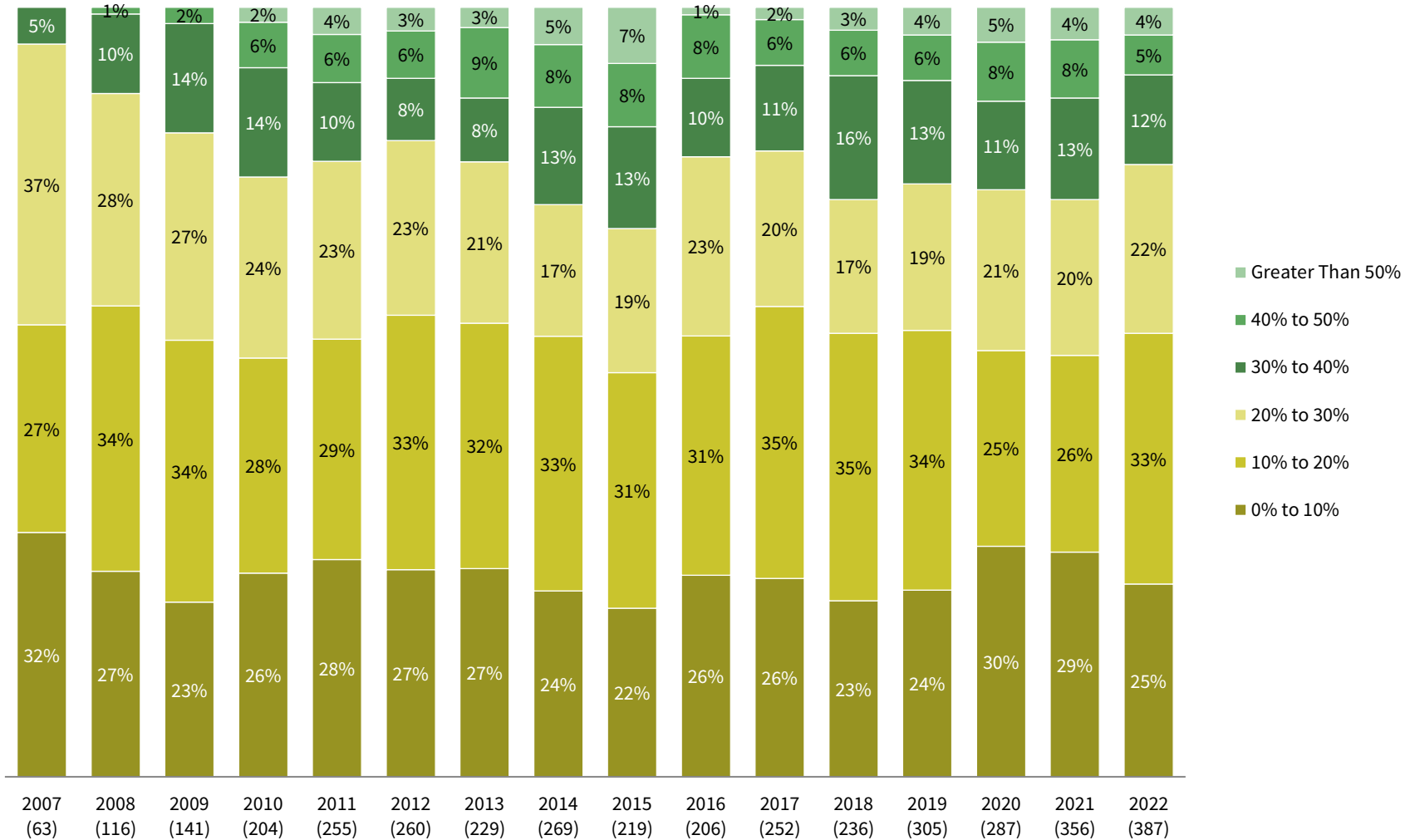


PE company margins have been stable over time

But in 2022, fewer companies operated at margins of 30% or higher than any year since 2017

AVERAGE ANNUAL EBITDA MARGIN BREAKDOWN OF ASIAN PRIVATE EQUITY-OWNED COMPANIES

As of December 31, 2022 • EBITDA/Revenue (%)

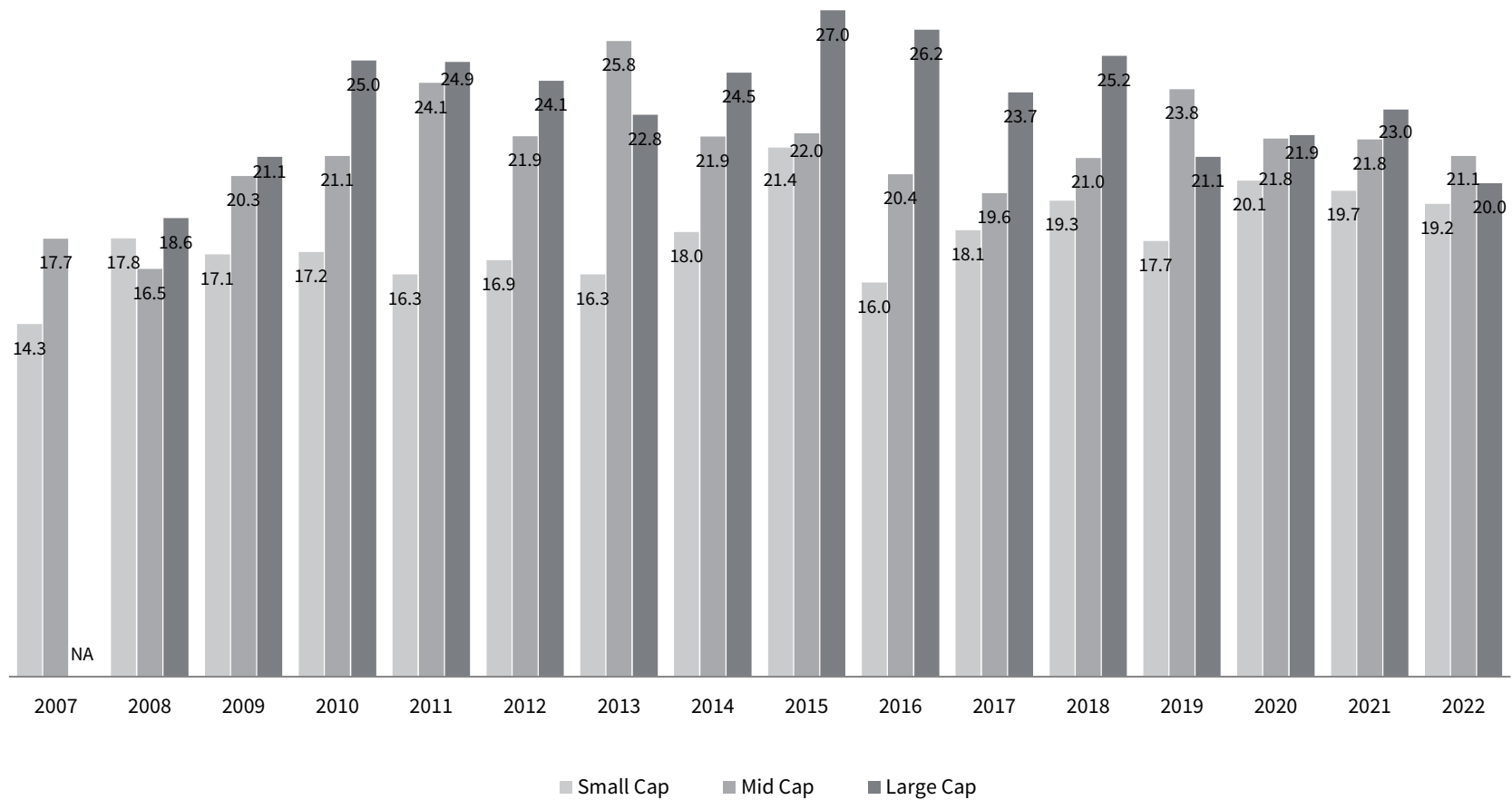


Over the full period, large companies have averaged the highest margins and small the lowest

But the difference among the size segments has been less pronounced since 2020

AVERAGE ANNUAL EBITDA MARGIN OF ASIAN PRIVATE EQUITY-OWNED COMPANIES BY ENTERPRISE VALUE SEGMENT

As of December 31, 2022 • EBITDA/Revenue (%)





CAMBRIDGE
ASSOCIATES

Contributors to this report include Andrea Auerbach, Dan Aylott, Drew Carneal, Keirsten Lawton, Caryn Slotsky, and Wyatt Yasinski.

Copyright © 2024 by Cambridge Associates LLC. All rights reserved.

This report may not be displayed, reproduced, distributed, transmitted, or used to create derivative works in any form, in whole or in portion, by any means, without written permission from Cambridge Associates LLC ("CA"). Copying of this publication is a violation of US and global copyright laws (e.g., 17 U.S.C. 101 et seq.). Violators of this copyright may be subject to liability for substantial monetary damages.

This report is provided for informational purposes only. The information does not represent investment advice or recommendations, nor does it constitute an offer to sell or a solicitation of an offer to buy any securities. Any references to specific investments are for illustrative purposes only. The information herein does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Information in this report or on which the information is based may be based on publicly available data. CA considers such data reliable but does not represent it as accurate, complete, or independently verified, and it should not be relied on as such. Nothing contained in this report should be construed as the provision of tax, accounting, or legal advice. PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE PERFORMANCE. Broad-based securities indexes are unmanaged and are not subject to fees and expenses typically associated with managed accounts or investment funds. Investments cannot be made directly in an index. Any information or opinions provided in this report are as of the date of the report, and CA is under no obligation to update the information or communicate that any updates have been made. Information contained herein may have been provided by third parties, including investment firms providing information on returns and assets under management, and may not have been independently verified.

The terms "CA" or "Cambridge Associates" may refer to any one or more CA entity including: Cambridge Associates, LLC (a registered investment adviser with the US Securities and Exchange Commission, a Commodity Trading Adviser registered with the US Commodity Futures Trading Commission and National Futures Association, and a Massachusetts limited liability company with offices in Arlington, VA; Boston, MA; Dallas, TX; New York, NY; and San Francisco, CA), Cambridge Associates Limited (a registered limited company in England and Wales, No. 06135829, that is authorized and regulated by the UK Financial Conduct Authority in the conduct of Investment Business, reference number: 474331); Cambridge Associates GmbH (authorized and regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht ('BaFin'), Identification Number: 155510), Cambridge Associates Asia Pte Ltd (a Singapore corporation, registration No. 200101063G, which holds a Capital Market Services License to conduct Fund Management for Accredited and/or Institutional Investors only by the Monetary Authority of Singapore), Cambridge Associates Limited, LLC (a registered investment adviser with the US Securities and Exchange Commission, an Exempt Market Dealer and Portfolio Manager in the Canadian provinces of Alberta, British Columbia, Manitoba, Newfoundland and Labrador, Nova Scotia, Ontario, Québec, and Saskatchewan, and a Massachusetts limited liability company with a branch office in Sydney, Australia, ARBN 109 366 654), Cambridge Associates Investment Consultancy (Beijing) Ltd (a wholly owned subsidiary of Cambridge Associates, LLC which is registered with the Beijing Administration for Industry and Commerce, registration No. 110000450174972), and Cambridge Associates (Hong Kong) Private Limited (a Hong Kong Private Limited Company licensed by the Securities and Futures Commission of Hong Kong to conduct the regulated activity of advising on securities to professional investors).