Criteria | Corporates | Industrials:

# Key Credit Factors For The Technology Hardware And Semiconductors Industry

**November 19, 2013**

*(**Editor's Note:** We republished this article on April 1, 2019, following the publication of our updated "Corporate Methodology: Ratios And Adjustments," on April 1, 2019, which supersedes parts of this criteria. See the "Revisions And Updates" section for details.)*

1. This article presents S&P Global Ratings' criteria for the technology hardware and semiconductors industry. This article aims to help market participants better understand the key credit factors in this industry. These criteria are related to "Corporate Methodology") and to "Principles Of Credit Ratings".
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## SCOPE OF THE CRITERIA

3. These criteria apply globally to ratings on technology hardware and semiconductor manufacturers, which include subsectors such as:
   - Semiconductors and semiconductor equipment;
   - Computer hardware, storage, and peripherals; electronic components and equipment; and office electronics;
   - Consumer electronics;
   - Communications equipment;
   - Electronic manufacturing services (EMS); and
   - Technology distributors.
4. IT services and software companies are excluded from the scope of this document. A separate report presents our criteria for these companies (see the Related Criteria And Research section below).

## SUMMARY OF THE CRITERIA

5. This article presents S&P Global Ratings' criteria for analyzing technology hardware and semiconductor manufacturers, complementing S&P Global Ratings' corporate methodology.
6. We view technology hardware and semiconductors as a "moderately high risk" industry under our

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criteria, given their "moderately high risk" cyclicality assessment and "moderately high risk" competitive risk and growth assessment.

7. In assessing technology hardware and semiconductor companies' competitive position, we specifically emphasize their position in emerging technologies, revenue growth, market share, diversification, and economies of scale. The companies' product quality is often standardized and their product positioning is often susceptible to material changes due to frequent and rapid technological changes in the industry.

8. In our assessment of financial risk, we often supplement standard ratios with our evaluation of absolute free operating cash flow (FOCF) generation and the FOCF to debt ratio. This is primarily because many companies in the technology hardware and semiconductors industry have high capital expenditure requirements and exhibit material working capital swings, both seasonally and over the course of the business cycle.

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## METHODOLOGY

## Part I: Business Risk Analysis

## A. Industry Risk

11. Within the framework of S&P Global Ratings' corporate criteria for assessing industry risk, we view technology hardware and semiconductor manufacturers as a moderately high risk industry (category 4). We derive our industry risk assessment from the segment's moderately high risk (4) cyclicality assessment and our view that the industry warrants a moderately high risk (4) competitive risk and growth assessment.

12. In our view, demand for technology hardware and semiconductor manufacturers is highly cyclical and a function of key drivers, such as:

    - GDP growth;
    - Capital and IT hardware spending in key client sectors, such as government, telecommunications, financial services, automotive, and capital goods;
    - Product innovation;
    - Consumer confidence and spending;
    - Availability of consumer credit; and
    - Sales of light vehicles.

13. Semiconductor manufacturers and some technology hardware manufacturers tend to be early-cyclical (i.e., they react to changes in economic activity before other industries). In addition, technology advancements, overcapacity, and demand cyclicality typically result in price declines.

14. Revenues and profits for certain subsectors, including semiconductor equipment, EMS, communications equipment, and technology distributors, vary significantly more than those in other subsectors, such as computer hardware, storage and peripherals, and electronic components.

## 1. Cyclicality assessment

15. We assess cyclicality for technology hardware and semiconductor manufacturers as moderately high risk (4) because the industry has demonstrated higher-than-average cyclicality in both revenue and profitability--two key measures we use to derive an industry's cyclicality assessment. Based on our analysis of global Compustat data, manufacturers experienced an average peak-to-trough (PTT) decline in revenues of about 4% during recessions since 1952. However, PTT revenue declines in the most recent 2000-2002 and 2008-2009 downturns were much more pronounced, at 19% and 18%, respectively. In addition to their exposure to the general economic cycle, semiconductor manufacturers and various other subsectors have experienced technology- and investment-driven boom and bust periods, such as the telecommunications and Internet bubble of the early 2000s, which resulted in PTT semiconductor revenue declines of about 30%-40%.

16. While the average PTT decline in EBITDA margin during recessions since 1952 was 13%, the PTT EBITDA margin decline varied significantly historically and was most pronounced during 2000-2002, at about 42%. In addition, the PTT EBITDA margin declines during the latest recessions (19% during 1989-1992 and 16% during 2007-2009) exceeded the historic average of 13% since 1952.

17. A high proportion of fixed costs (including research and development [R&D]) in many of the technology hardware and semiconductors industry's subsectors results in significant operating leverage, which amplifies margin cyclicality. During severe downturns, it is not uncommon for semiconductor or semiconductor equipment manufacturers to experience one or more quarters of negative EBITDA, even for companies with solid market positions.

## 2. Competitive risk and growth assessment

18. We view technology hardware and semiconductor manufacturers as warranting a moderately high (4) competitive risk and growth assessment. For competitive risk and growth, we assess the following four subfactors as low, medium, or high risk:

- Effectiveness of industry barriers to entry;
- Level and trend of industry profit margins;
- Risk of secular change and substitution by products, services, and technologies from other industries; and
- Risk in growth trends.

## a) Effectiveness of barriers to entry – medium risk

19. Barriers to entry in the technology hardware and semiconductors industry are often limited because most markets--with a few exceptions--are fragmented. Brand equity is also generally limited, with several exceptions for consumer electronics companies or computer hardware, storage, and peripherals makers. However, even established players can quickly lose significant market share due to fast technological and product innovation or rapid changes in consumer needs and preferences.

20. Intellectual property rights, the adoption of proprietary technology and platforms, and process technology, which is particularly critical in semiconductor manufacturing, could provide some

barriers to entry. Nevertheless, process technology advantages have become less prevalent because companies increasingly outsource their production value chain. The cost of licensing key technologies from patent owners can be prohibitive for new entrants, however.

21. Access to capital can be an important differentiator during difficult market conditions that favors larger players, especially in semiconductor production. Factory costs rise significantly with each new generation of semiconductors.

22. The complexity of manufacturing processes, the need for "design wins" with a concentrated client base, and long product lifecycles somewhat protect the most established players in certain segments, such as analog semiconductors.

## b) Level and trend of industry profit margins – high risk

23. Generally, operating margins within the industry are highly volatile as a result of fierce price pressure due to often-fragmented competition, moderate to high fixed operating costs, volatile customer demand that is often difficult to predict, and short product lifecycles (e.g., for handset makers, consumer electronics, or memory chipsets)--particularly for companies that are not at the leading edge in terms of new product developments. However, we expect the industry's overall profitability trends will remain relatively unchanged over future industry cycles, with continuous shifts during product lifecycles as new market leaders arise and profits on legacy products decline.

24. Currency mismatches between costs and revenues can accentuate margin volatility because many semiconductor and technology hardware companies serve global end-markets and frequently price products in U.S. dollars. Fluctuating input costs, such as silicon, precious metals, and energy, can also cause margin volatility. Nevertheless, some companies have outsourced part or all of their manufacturing to specialized companies (such as semiconductor foundries or EMS providers), which has somewhat reduced fixed costs and, therefore, margin volatility. However, this also leads to a concentrated supplier base with more pricing power and risks of supply squeezes and gluts during demand peaks and troughs.

25. Revenue and margin predictability is short-term and typically not supported by significant order books. In addition, revenue and order seasonality can be significant, resulting in profit and working capital swings.

## c) Risk of secular change and substitution by products, services, and technologies from other industries – high risk

26. Technology hardware and semiconductor companies constantly face secular changes, for example:

- Improving production efficiency (e.g., the size of semiconductor wafers has increased to 450mm from 300mm and 200mm);
- Improving performance efficiency (e.g., semiconductor nodes--the shortest link on a chip--continue to shrink, from 90 nanometers (nm) to 45nm to 22nm to 10nm);
- The migration from hardware-based functionality to software-based functionality, which blurs the line between technology hardware and software companies;
- The shift from mobile phones to smartphones; and
- The shift from PCs to laptops and recently to tablets or ultrabooks.

27. Rapid shifts in technology trends, consumer preferences, and form factors (i.e., the physical size and shape of a piece of computer hardware) can trigger quick market share changes. For example, mobile computing and communications and cloud computing are secular changes currently affecting pricing, volume, and market shares across the PC, servers, tablet, handset, smartphone, and semiconductor segments. In addition, we observe frequent product standardization or commoditization over time. Furthermore, government support and subsidies for R&D and manufacturing sites can support the emergence, and to some extent the sustainability, of companies.

### d) Risk in growth trends – low risk

28. While often highly cyclical, technology hardware and semiconductor manufacturers generally enjoy favorable long-term demand dynamics that support revenue growth at or above nominal GDP growth as a result of megatrends such as digitalization, virtualization, miniaturization, cloud computing, electrification, mobile communication, and connectivity or energy savings. We also observe increasing electronics content in key consumer end-markets such as automotive, home appliances, and telecommunications. Furthermore, we note the industry's long-established track record of innovation that leads to efficiency gains, as evidenced by "Moore's law," which states that computing power roughly doubles every 18-24 months. We, therefore, expect semiconductor revenues to outpace GDP growth by 50% over the medium term. In addition, we expect technology hardware revenue growth to at least equal GDP growth, although results will vary meaningfully by segment.

29. Even though companies often significantly increase their product volumes and product performance, high price pressure or the shift from hardware to software functionality meaningfully constrains the sector's overall revenue growth. In addition, product substitution could rapidly diminish revenues for some products (e.g., the substitution of hard disk drives through solid state drives or declining PC and DVD revenues due to substitution by notebooks and tablets, as well as video on demand).

## B. Country Risk

30. Country risk plays a critical role in determining the ratings for companies in a given country. Country-related risk factors can have a substantial effect on a company's creditworthiness, both directly and indirectly. While our sovereign credit ratings suggest the general risk local entities face, they may not fully capture the risk applicable to the private sector. We look beyond the sovereign ratings to evaluate the specific economic, demographic, and other country risks that may affect the entity's creditworthiness. In assessing country risk for a technology hardware and semiconductor manufacturer, our analysis uses the same methodology as with other corporate issuers (see "Corporate Methodology").

31. Our primary measure for determining exposure to country risk is assets. This is because country risk and macroeconomic factors, such as the risk of political or labor unrest, could be important for companies that have a regionally concentrated supplier base or a narrow manufacturing or R&D footprint. In addition, insufficient intellectual property rights protection or product liability lawsuits could turn out to be significant risk factors. Furthermore, demand in the technology hardware and semiconductors sector is often determined more by global product innovation and technology cycles than local macroeconomic factors and country risk considerations.

32. In some cases, we assess country risk exposure through revenues if we believe there is a significant risk deriving from a company's narrow domestic or only regional client base on demand potential.

## C. Competitive Position (Including Profitability)

33. Under our corporate criteria, we assess a company's competitive position as (1) excellent, (2) strong, (3) satisfactory, (4) fair, (5) weak, or (6) vulnerable. For technology hardware and semiconductor manufacturers, we review an individual company's:

- Competitive advantage;
- Scale, scope, and diversity;
- Operating efficiency; and
- Profitability.

34. The first three subfactors are independently assessed as (1) strong, (2) strong/adequate, (3) adequate, (4) adequate/weak, or (5) weak. Profitability is assessed by combining two components: the level of profitability and the volatility of profitability.

35. After separately assessing competitive advantage; scale, scope, and diversity; and operating efficiency, we determine the preliminary competitive position assessment by ascribing a specific weight to each component. The applicable weightings will depend on the company's competitive position group profile (CPGP). The CPGP assigned to most technology hardware and semiconductor manufacturers that we rate is "capital or asset focus"--that is, they require sizeable capital investments and asset outlays to sustain their market position and keep up with innovation. For these companies, we weight the first three subfactors of competitive position as follows:

- Competitive advantage (30%);
- Scale, scope, and diversity (30%); and
- Operating efficiency (40%).

36. We may assign the "service or product focus" CPGP to those few technology hardware companies with an identifiable brand and competitive standing in consumer-oriented segments. These instances are rare, however, because of the short product and technology lifecycle and the typically rapid obsolescence in the industry. The subfactor weighting for companies assigned the "services and product focus" CPGP is as follows:

- Competitive advantage (45%);
- Scale, scope, and diversity (30%); and
- Operating efficiency (25%).

37. Some large technology companies have business lines that fall outside of the technology hardware and semiconductors sector; where applicable, we assess the competitive position of these businesses independently by following the key credit factors relevant for those industries.

### 1. Competitive advantage

38. Our assessment of competitive advantage for a technology hardware or semiconductor company focuses on intellectual property, technology positioning, revenue growth, distribution capabilities, manufacturing or process technology advantages, customer relationships, name or brand recognition, and pricing and bargaining power.

39. A company with a "strong" or "strong/adequate" competitive advantage assessment has a combination of the following characteristics:

- Significant intellectual property, potentially generating meaningful license revenues;
- A strong position on growing and emerging technologies supported by effective and focused R&D spending;
- Consistent above-market-average revenue growth due to product differentiation or the ability to command price premiums;
- Strong distribution capabilities in the addressable markets;
- Sustainable manufacturing or process technology advantages;
- Long-term customer relationships, including R&D co-operations, or particular relationships in a broader supply chain that create barriers to entry or customer switching costs;
- A high degree of name/brand recognition;
- A high degree of leverage with key product manufacturers and vendors/suppliers; and
- Pricing power.

40. A company with a "weak" or "adequate/weak" competitive advantage assessment typically has a combination of the following characteristics:

- Limited or no intellectual property;
- A weak position on growing and emerging technologies or a presence mainly in markets with limited growth prospects;
- Consistent average or below-market-average revenue growth;
- Average or trailing manufacturing process technologies and efficiencies;
- Limited leverage with key product manufacturers and vendors/suppliers;
- A lack of name/brand recognition; and
- A lack of pricing power.

## 2. Scale, scope, and diversity

41. Our scale, scope, and diversity assessment includes our view of:

- Evolution of market shares;
- Supplier and customer concentration;
- Diversity of end-markets, products, and services;
- Relative attractiveness of markets, products, and services (i.e., size, expected growth, intensity of competition); and
- Company- or industry-specific country-related risk factors that are not captured in the "country risk" section above.

42. A "strong" or "strong/adequate" assessment of scale, scope, and diversity for a technology hardware or semiconductor company is generally characterized by a combination of:

- Leading market share that's significantly higher than the second and third players in large but

fragmented markets or a market share that's closely trailing the no. 1 player in large but less fragmented markets;

- A diverse customer or large contract base (i.e., no customer or contract accounts for more than 15% of revenues and the top 10 customers or contracts contribute less than 50% of revenues);
- A track record of repeat business throughout technology generation changes;
- A diverse manufacturing footprint, with limited reliance on single suppliers;
- A broad range of products and services, including a combination of maintenance, spare parts, support, after-sale service, and financing; and
- Serves a broad range of end-markets, none of which exceeds more than one-third of total revenues.

43. A "weak" or "adequate/weak" assessment of scale, scope, and diversity typically is characterized by a combination of:

- No leading market positions apart from niche markets or competition from many peers with similar market shares;
- A concentrated customer or contract base, with one or more customers or contracts accounting for more than 15% of revenues and the top 10 customers or contracts contributing more than 50% of revenues;
- A narrow product focus or a product offering in intensely competitive and/or closely correlated markets;
- Limited recurring revenues from maintenance, spare parts, support, after-sale service, and financing;
- A focus on a particular customer segment, especially a down-scale, more competitive customer; and
- A concentrated supplier base and limited distribution capabilities.

44. We generally view geographic diversity as a less important factor when we assess diversification primarily because many end-markets for the sector have become global and well interconnected, as economic trends often do. Hence, the benefits of geographic diversity often seem to only modestly reduce revenue volatility for many semiconductor and technology hardware companies.

## 3. Operating efficiency

45. A semiconductor or technology hardware company with a high degree of operating efficiency should generate better profit margins during all market conditions. To assess operating efficiency, we primarily track gross margins and selling, general, and administrative (SG&A) costs.

46. For semiconductor companies, provided that the information is available to us, we track and compare with peers the manufacturing operations' capacity utilization, the percentage of outsourced production capacity, and the variance of gross margins relative to capacity utilization levels during the industry cycle.

47. For technology distributors, we also track and compare with peers fixed asset turnover (specifically inventory turns), cash-conversion cycles (specifically days sales outstanding), returns on invested capital, operating margin stability, and free cash flow cycles.

48. For EMS, we also track and compare with peers the manufacturing service mix of low-margin

high-volume production versus higher-margin specialty manufacturing, asset turnover, and service concentration in more cyclical industry verticals, such as telecommunications.

49. "Strong" or "strong/adequate" operating efficiency is characterized by a combination of:

- Economies of scale and efficiencies that lead to above-average profit margins (measured by gross margin, EBITDA margins, and return on capital) compared to peers, taking into account differences in sales mix, capacity utilization, asset intensity, or average selling prices;
- Overhead costs at competitive levels (measured via SG&A as a percentage of revenues) while maintaining effective staff functions;
- R&D efficiency or return on R&D as measured by the R&D/sales ratio and sales growth compared to peers with similar products and market positions;
- Effective and flexible supply chains with a history of limited disruptions or bottlenecks relative to peers when demand is high or following natural disasters, such as the Thai flooding or the earthquake and consequent nuclear accident in Fukushima;
- Flexible cost structures that limit pressure on gross margins during industry downturns; and
- Flexible manufacturing capabilities that allow better-than-industry-average capacity utilization during the industry cycle, as well as efficient and timely product transitions in existing plants.

50. "Weak" or "adequate/weak" operating efficiency is characterized by a combination of:

- Profitability consistently below or more volatile than peers;
- Positive operating margins only during the presence of favorable industry conditions;
- Noncompetitive levels of SG&A or ineffective R&D spending, requiring continuous restructuring;
- Inflexible cost structures due to rigid labor laws or strong unions;
- High capital intensity coupled with highly fixed costs of goods sold and limited outsourcing of production;
- Inflexible or vulnerable supply chains, resulting in inventory build-ups, shortfalls, bottlenecks, or quality issues during the industry cycle; and
- Excess, inflexible, or inefficient manufacturing capacity.

## 4. Profitability

51. The profitability assessment can confirm or modify the preliminary competitive position assessment. The profitability assessment consists of two components: (1) the level of profitability and (2) the volatility of profitability. We combine these two components into the final profitability assessment using a matrix. To evaluate volatility, we require several years of historical data. In cases in which we do not have such historical data, we perform the volatility assessment based on peer analysis. EBITDA margin and return on capital are the primary metrics that we use to evaluate profitability for companies in the technology hardware and semiconductors industry.

### a) Level of profitability

52. We assess the level of profitability on a three-point scale: "above average," "average," and "below average." Tables 1 and 2 outline the guidelines for the commonly used profitability measures and

ranges for assessing the level of profitability for the technology hardware and semiconductors sector's various subsectors.

Table 1

**EBITDA Margin Ranges For Assessing The Level Of Profitability For The Technology Hardware And Semiconductors Industry**

| Subsector | Below average | Average | Above average |
|---|---|---|---|
| Semiconductor equipment manufacturers | <15% | 15%-25% | >25% |
| Semiconductors | <20% | 20%-30% | >30% |
| Consumer electronics | <7% | 7%-12% | >12% |
| Technology distributors | <3% | 3%-6% | >6% |
| Communications equipment | <10% | 10%-20% | >20% |
| Electronic manufacturing services | <10% | 10%-20% | >20% |
| Computer hardware, storage and peripherals, electronic components and equipment, and office electronics | <12% | 12%-18% | >18% |

Table 2

**Return On Capital Ranges For Assessing The Level Of Profitability For The Technology Hardware And Semiconductors Industry**

| | Below average | Average | Above average |
|---|---|---|---|
| All companies | <8% | 8%-12% | >12% |

53. Due to their generally limited value-added contributions, technology distributors have significantly lower EBITDA margins than most other companies in the technology hardware and semiconductors sector. These low margins are indicative of the sector's average levels of profitability, which vary from the low-single digits for narrower-focused PC distributors to the mid-single digits for broader-line firms. Nonetheless, due to the typically high asset turnover, technology distributors are able to achieve similar return on capital.

54. In the case of conglomerates or large groups with operations in several subsectors in the technology hardware and semiconductors sector, we assess EBITDA margins for each subsector--whenever the subsectors' margins are disclosed or can be estimated. Thereafter, we assess the level of profitability on a weighted-average basis and verify the outcome with the level of profitability based on the group's return on capital. If a group does not disclose EBITDA margins for its segments or if a company has a special business model that does not fully fit into the subsectors as outlined in table 1, we primarily use return on capital to assess the level of profitability.

## b) Volatility of profitability

55. We evaluate the volatility of profitability on a six-point scale from "1" (very low) to "6" (very high).

56. In accordance with our corporate criteria, we generally determine the volatility of profitability assessment using the standard error of regression (SER), provided we have at least seven years of historical annual data. We generally use the EBITDA margin as the metric to determine the SER for technology hardware and semiconductor manufacturers. Also in accordance with the corporate methodology, we may--provided certain conditions are met--adjust the SER assessment by up to

two categories better (less volatile) or worse (more volatile). If we do not have sufficient historical information to determine the SER, we follow the corporate methodology to determine the volatility of profitability assessment.

## Part II: Financial Risk Analysis

## D. Accounting and analytical adjustments

57. In assessing a technology hardware and semiconductor company's accounting characteristics, we use the same methodology as with other corporate issuers (see our corporate methodology). Our analysis of a company's financial statements begins with a review of its accounting to determine whether the statements accurately measure the company's performance and position relative to its peers and the larger universe of corporate entities. To allow for globally consistent and comparable financial analyses, our rating analysis may include quantitative adjustments to a company's reported results. These adjustments also better align a company's reported figures with our view of underlying economic conditions. Moreover, they allow for a more accurate portrayal of a company's ongoing business. Adjustments that pertain broadly to all corporate sectors, including this sector, are discussed in "Corporate Methodology: Ratios And Adjustments".

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## E. Cash Flow/Leverage Analysis

60. In evaluating semiconductor and technology hardware companies' cash flow adequacy, our analysis uses the same methodology as with other corporate issuers (see "Corporate Methodology"). We assess cash flow/leverage on a six-point scale--ranging from (1) minimal to (6) highly leveraged--by aggregating the assessments of a range of predominantly cash flow-based credit ratios, which complement each other by focusing attention on the different levels of a company's cash flow in relation to its obligations.

### 1. Core ratios

61. In accordance with S&P Global Ratings' ratios and adjustment criteria, we determine two core credit ratios: FFO/debt and debt/EBITDA. We supplement these core ratios with FOCF to debt for companies with high capital expenditures or material working capital swings seasonally or during the business cycle to derive the adjusted cash flow leverage assessment.

62. We classify many companies in the semiconductors and technology hardware sector as "volatile" or "highly volatile" for our cash flow criteria because we expect that their cash flow leverage assessments will worsen by one or two, or two or three categories, respectively, during periods of stress based on their business risk profile. As a result, we lower the final cash flow leverage assessment for these companies by one or two categories from the previously determined adjusted cash flow leverage assessment, respectively.

63. Table 3 shows our typical volatility adjustment for the cash flow leverage assessments for each subsector in the technology hardware and semiconductors industry. However, we could deviate from these assessments. For example, within the semiconductors subsector, we assess memory chip makers as "highly volatile" but analog chip makers as "stable." We also observed that some consumer electronics makers or distributors could be classified as "stable." In addition,

depending on the degree of revenues generated from software, maintenance, and managed or professional services, communications equipment makers could be assessed as "volatile" or "stable. "

Table 3

**Typical Volatility Assessment Of Cash Flow Leverage Assessments In The Technology Hardware And Semiconductors Industry**

| Subsector | Volatility adjustment |
|---|---|
| Semiconductor equipment | Highly volatile |
| Communications equipment | Highly volatile |
| Electronic manufacturing services | Volatile |
| Consumer electronics | Volatile |
| Technology distributors | Volatile |
| Semiconductors | Volatile |
| Computer hardware, storage and peripherals, electronic components and equipment, and office electronics | Stable |

### 2. Supplemental ratios

64. In addition to our assessment of a company's core ratios, we also consider supplemental ratios to better understand a company's credit risk profile and fine-tune our cash flow analysis. In our view, a semiconductor and technology hardware manufacturer's inability to meet cash interest payments or a debt maturity would be the most likely cause of a cash default during or immediately following an industry downturn. Therefore, we consider as supplemental ratios:

- Absolute FOCF generation and FOCF/debt. In periods of declining sales and orders, inventory liquidation and reductions in account receivables support cash generation; these factors are not captured (apart from the debt or cash amounts) in the FFO/debt or debt/EBITDA ratios, but are better illustrated in FOCF. In addition, working capital requirements at the beginning of an industry recovery, as well as continuous investment needs in new technology and advanced manufacturing equipment, are paramount for many technology hardware and semiconductor manufacturers to maintain their competitiveness and operating margins.
- EBITDA/interest coverage, particularly when the core ratios indicate a preliminary cash flow/leverage assessment of "significant" or weaker.

## Part III: Rating Modifiers

## F. Diversification/Portfolio Effect

65. The diversification/portfolio effect analysis for companies in the technology hardware and semiconductors sector uses the same methodology as for other corporate issuers (see "Corporate Methodology"). This modifier is only active for a small number of companies with significant operations outside this sector because companies in this sector generally tend to be highly focused. For the largest and most diversified groups within the sector, we typically capture diversification in our "scale, scope, and diversity" assessment within competitive position.

## G. Capital Structure

66. In assessing a technology hardware and semiconductor company's capital structure, our analysis uses the same general methodology as with other corporate issuers (see "Corporate Methodology").

## H. Liquidity

67. In assessing a technology hardware and semiconductor company's liquidity, our analysis uses the same general methodology as with other corporate issuers (see "Methodology And Assumptions: Liquidity Descriptors For Global Corporate Issuers").

## I. Financial Policy

68. In assessing a technology hardware and semiconductor company's financial policy, our analysis uses the same methodology as with other corporate issuers (see "Corporate Methodology").

## J. Management And Governance

69. In assessing a technology hardware and semiconductor company's management and governance, our analysis uses the same methodology as with other corporate issuers (see "Corporate Methodology", and "Methodology: Management And Governance Credit Factors For Corporate Entities And Insurers").

## K. Comparable Ratings Analysis

70. In assessing the comparable ratings analysis for a technology hardware and semiconductor company, our analysis uses the same methodology as with other corporate issuers (see "Corporate Methodology").

## REVISIONS AND UPDATES

This article was originally published on Nov. 19, 2013. These criteria became effective on Nov. 19, 2013.

Changes introduced after original publication:

- On July 28, 2014, we republished this article to correct the terminology for the volatility adjustment of our cash flow leverage assessments in paragraph 63 and table 3.
- Following our periodic review completed on June 2, 2016, we updated the contact information, updated criteria references, and deleted outdated sections that appeared in paragraphs 2, 9, and 10, which were related to the initial publication of our criteria and no longer relevant.
- Following our periodic review completed on June 2, 2017, we updated criteria references.
- Following our periodic review completed on May 29, 2018, we updated the contact information and criteria references and renamed the section "Material Related To Initial Publication And Revision History" to "Revisions And Updates."

- On April 1, 2019, we republished this article to make nonmaterial changes. We removed paragraphs 58-59 because they were superseded by "Corporate Methodology: Ratios And Adjustments," published on April 1, 2019 (Ratios and Adjustments). The sector-specific accounting and analytical adjustments previously included in those paragraphs are now included in the Guidance supporting the Ratios and Adjustments criteria. We also updated the criteria references.

## RELATED CRITERIA AND RESEARCH

### Superseded Criteria

- Key Credit Factors: Methodology And Assumptions On Risks In The Global High Technology Industry, Oct. 15, 2009

### Related Criteria

- Corporate Methodology: Ratios And Adjustments: April 1, 2019
- Reflecting Subordination Risk In Corporate Issue Ratings, March 28, 2018
- Recovery Rating Criteria For Speculative-Grade Corporate Issuers, Dec. 7, 2016
- Methodology: Jurisdiction Ranking Assessments, Jan. 21, 2016
- Methodology And Assumptions: Liquidity Descriptors For Global Corporate Issuers, Dec. 16, 2014
- Corporate Methodology, Nov. 19, 2013
- Methodology: Industry Risk, Nov. 19, 2013
- Country Risk Assessment Methodology And Assumptions, Nov. 19, 2013
- Key Credit Factors For The Technology Software And Services Industry, Nov. 19, 2013
- Methodology: Management And Governance Credit Factors For Corporate Entities And Insurers, Nov. 13, 2012
- Principles Of Credit Ratings, Feb. 16, 2011

### Related Research

- Guidance: Corporate Methodology: Ratios And Adjustments, April 1, 2019

These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as S&P Global Ratings' assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.

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