

Rating Methodology

Moody's Global Corporate Finance

Table of Contents:

Summary	1
Industry Definition	2
About the Rated Universe	3
Industry Overview	4
Key Rating Issues going into the next decade	7
About This Rating Methodology	7
The Key Rating Factors	10
Other Rating Considerations	23
Final Consideration	25
Appendix 1 – Rating Grid	26
Appendix 2 – Consolidated Factor Mapping Results	28
Moody's Related Research	29

Analyst Contacts:

Frankfurt	49.69.707.30.700
Christian Hendker, CFA	
Johannes Wassenberg	
London	44.20.7772.5454
Niel Bisset	
Monica Merli	
Eric de Bodard	
Andrew Davison	
New York	1.212.553.1653
George Meyers	
Paul Aran	
Dan Gates	
Bart Oosterveld	
Sydney	61.2.9270.8100
Ian Lewis	
Peter Fullerton	
Tokyo	81.3.5408.4000
Kyosuke Kaji	
Emiko Otsuki	
Hong Kong	852.2916.1121
Clara Lau	
Chris Park	

October 2007

Global Construction Methodology

Summary

The primary goal of this rating methodology is to help issuers, investors and other participants in the industry understand how Moody's assesses risk in the global construction industry and to enable our constituents to be able to gauge a company's rating.¹ This methodology is not an exhaustive treatment of all factors reflected in Moody's ratings, but it should enable the reader to understand the key considerations and financial ratios used by Moody's in the final rating determination.

There are five key factors that Moody's uses to examine credit risk and assign ratings in the construction sector. Each of these encompasses a number of sub-factors. These five rating factors, which will be closely examined in this report, are as follows:

1. Scale and Stability
2. Business Profile
3. Operating Efficiency
4. Capital Structure and Liquidity
5. Financial Strength

A number of other generic factors such as quality of management or corporate governance can also have a meaningful impact on ratings assigned to construction companies.

¹ Moody's will also apply this methodology in developing estimated ratings for unrated construction companies where these are required inputs for other Moody's methodologies, e.g. Moody's Request for Comment "Construction Risks in Privately-Financed Public Infrastructure Projects" (#98409). Such estimated ratings may be conservative relative to formal published ratings due to the limited information available to inform the rating assessment.



Global Construction Methodology

Highlights of this report include:

- An overview of the key risk factors for the global construction industry
- A description of the rating methodology and the key factors that drive rating quality
- Discussion of "outliers" - companies whose rating for a specific factor differs significantly from what its actual rating would otherwise imply
- An explanation of other rating considerations
- A summary of our results and their weightings

In the Appendix of this report, we have also provided a detailed rating grid, which maps each key rating factor, including sub-factors and financial metrics, to specific letter-ratings. The purpose of this rating grid is to provide issuers, investors and other participants with a reference tool when comparing credit profiles within the construction sector. We would nonetheless caution that a company will not necessarily match exactly each letter-rating dimension of the grid; the rating output of the grid will therefore be a balance of all the factors that have been identified. Furthermore, it must be recognised that ratings are prospective opinions on future relative credit risk.

Industry Definition

The construction industry includes companies which generate more than 50% of their total revenues or operating cash flows as general contractors or subcontractors in the construction or refurbishment of:

- Buildings for commercial purposes (e.g. offices) or public purposes (e.g. hospitals)
- Civil infrastructure e.g. tunnels, roads, bridges, harbours
- Industrial infrastructure, including groundwork for plant construction, dams, hydro, thermal and nuclear power stations or oil & gas processing facilities.

Moody's definition of the sector also includes companies that provide specialised engineering and maintenance services on a contract basis for completed construction projects, e.g. not just construction but also maintenance of electrical and mechanical systems in facilities.

This methodology does neither cover building materials companies, which deliver the raw material inputs for construction projects and are covered in Moody's Building Materials Methodology, nor companies focused on homebuilding for private customers, covered in Moody's Homebuilding Methodology. In addition, real estate development companies are not included, since they are focused on generating profitability by buying, developing and selling land or properties, where normally construction companies (which are covered in this methodology) are engaged to pursue the development phase. Companies focused on the production and installation of heavy equipment and machinery for industrial users and utilities, which are also providing operation, maintenance and service of equipment sold, are covered in Moody's Heavy Manufacturing Rating Methodology.

Across the globe, construction companies are increasingly diversifying their business profile and the ownership or operation of projects, in particular roads and other transport infrastructure, has been predominant among such diversification strategies. Companies predominantly active (more than 50% of revenues) in the ownership or operation of constructed projects (e.g. roads, bridges, tunnels, hospitals, schools etc.) are more likely to be covered by other methodologies such as Moody's Toll Roads Rating Methodology or the draft methodology for Operating Risk in Privately Financed Public Infrastructure (PFI/ PPP/ P3) Projects.

Debt levels of those construction companies who are also operating constructed projects tend to be substantially higher, with a significant level of limited-recourse debt issued to fund the investment of the constructed project. The existence of limited-recourse debt points to the recognition by the investors of high-quality sustainable ring-fenced cash flows² available to service limited recourse debt. For the purpose of this methodology, we consider consolidated financial statements including both recourse and limited-recourse debt

² See Special Comment: Covenants and Ring-Fencing for Wholly-Owned Subsidiaries, # 102983

Global Construction Methodology

given the limited ability of publicly available data to separately analyse operating performance and capital structures of construction and project operation divisions. However, the ultimate decision as to whether limited-recourse debt should be considered in the rating assessment of a construction company will be determined on a case-by-case basis by the rating committee.

About the Rated Universe

Moody's publicly rates 16 construction companies globally with an aggregate of around USD 4.5 billion of rated debt. 1 private company that does not file public statements is excluded from this publication. See the table below for a complete list of publicly traded companies in this sector.

Global Construction Companies As per October 2007

Global Construction Industry Ratings 16 Issuers with USD4.5bn of Rated Debt

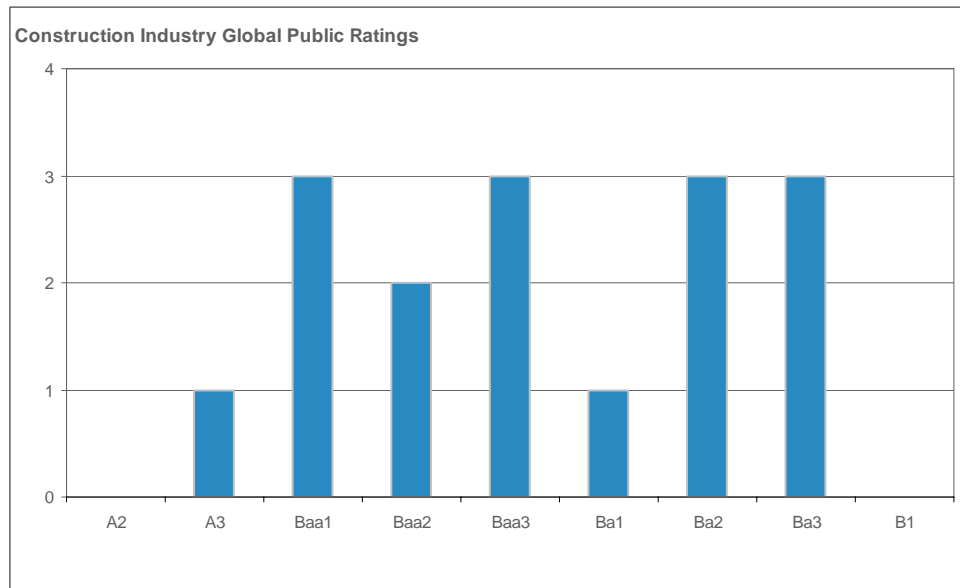
Company	Public Rating	Rating Outlook	Domicile	LT Rated Debt (\$ US MM Face Amount)
Fluor Corporation	A3	Stable	U.S.	330
Kajima Corporation	Baa1	Stable	Japan	216
Leighton Holdings Limited	Baa1	Stable	Australia	173
GS Engineering & Construction	Baa1	Stable	Korea	-
Taisei Corporation	Baa2	Positive	Japan	87
Larsen & Toubro Limited	Baa2	Stable	India	-
Lend Lease Corporation Limited	Baa3	Stable	Australia	1,087
Maeda Corporation	Baa3	Positive	Japan	70
Obrascon Huarte Lain	Baa3	Stable	Spain	987
EMCOR Group, Inc.	Ba1	Positive	U.S.	-
Dycom Industries, Inc.	Ba2	Stable	U.S.	150
Penta-Ocean Construction Co., Ltd.	Ba2	Stable	Japan	-
The Shaw Group Inc.	Ba2	Positive	U.S.	850
MasTec, Inc.	Ba3	Stable	U.S.	150
Foster Wheeler LLC	Ba3	Positive	U.S.	450
Quanta Services, Inc.	Ba3	Stable	U.S.	-
Total				4,549

Geographically,

- 6 % of the rated issuers (and 22% of rated debt) are based in Europe,
- 44 % in the Americas (and 42% of rated debt)
- 50 % in Asia Pacific (and 36% of rated debt)

44 % of the universe is rated below investment grade.

Global Construction Methodology



Industry Overview

Although the universe consists of issuers of varying size focused on different customer industries with a differing scope of construction services, rated issuers do exhibit similar business fundamentals and face many common credit considerations.

Companies in the construction industry share a number of key features that have an impact on their credit profiles:

Construction industry is highly cyclical

The patterns of general economic cycles and specific industry cycles are a primary driver of demand for construction and refurbishment activity which influence the revenue growth rates of construction companies. Besides the exposure to certain geographical areas, the customer mix of a construction company determines the correlation of a company's operating performance volatility with the cycles of specific economies or industries. From a broader customer segmentation perspective, on the one hand private commercial customers and on the other hand public customers including governments or local communities show varying contracting behaviour through the cycle. **Private commercial sector** customers, whose contracts are normally of higher profitability than public contracts (Japan is an exception: in Japan Public-sector contracts have historically often been more profitable than private sector contracts), may delay or cancel new projects when the economy slows, but could shift towards demand for refurbishment projects depending on their specific financial condition and investment policies. **Public-sector** contracts on the other hand, which are typically less profitable, are highly correlated to a government's fiscal policy or spending plans - which are not necessarily linked to the stage of an economical cycle in a specific country. Public-sector spending could even show anti-cyclical spending patterns, to stimulate the economy through the construction sector.

In addition, over the last few years governments' need to reduce their fiscal deficits and commitment to lowering the cost of public projects have further negatively affected the profitability of public-sector contracts.

Given these fundamental differences in contracting behaviour and also profitability levels between private and public sector customers, Moody's analyses the current and anticipated customer structure of a construction company (Factor 2: Project/Customer Concentration). This analysis is an important starting point to estimate the operating performance and hence credit metrics of a construction company through the cycle.

Global Construction Methodology

Industry is characterised by relatively low and volatile earning levels

As a result of the cyclical nature of the construction industry, profitability and cash generation levels are highly volatile. The magnitude of volatility does however depend on the level of operating flexibility of a construction company. Low industry profitability levels compared to those of the manufacturing industry are often a result of extensive levels of subcontracting, which reduce the value added and hence profitability for the company but on the other hand substantially increase the level of operating flexibility through the cycle. In order to offer a complete solution package, many construction companies have become "general contractors", who coordinate resources from various "subcontractors" and execute their work on a project-by-project basis, but general contractors retain the responsibility for project completion. Subcontracting of work allows them to limit fixed costs and ensure flexible cost structures relative to other manufacturers, but on the other hand operating profitability could be extensively reduced - depending on the volume of subcontracting. Since the general contractor bills the whole project, he will recognise the full revenues but pass on part of the profit to the subcontractors. However, the selection of reliable partners and tight control of delivery schedules and service quality are critical to the success of a project.

Another determining factor for operating margins and earnings volatility (captured in Factor 3 Operating Efficiency) is the dominant type of construction contracts agreed. While "**fixed-price**" contracts offer a relatively high margin potential, the likelihood for cost overruns in particular for contracts with a long contract duration is much more severe than for "**cost-plus** contracts" or "fee for service contracts", where the construction company does not bear the risk of cost overruns. Therefore these "cost-plus" contracts offer a higher level of earnings stability (see discussion of "quality of orders" under Factor 1) but provide lower margin potential.

Profitability levels in the industry are also burdened by time-consuming competitive tender procedures for order awards, leading to aggressive bidding by construction companies. In highly competitive markets or in cyclical downturns, companies may relax margin standards in order to win tenders and fill capacity with the knowledge that variable costs - but not all fixed costs - will be covered. This can lead to (temporary) operating losses and cash flow deficits. Public contracts in particular are normally secured through these tender procedures and are generally linked to greater risk and reduced margins given the focus on price compared to more profitable referral work from commercial customers.

Recent trends are putting additional pressure on margins as (1) public orders are declining as most public authorities battle with their budget deficits; (2) some construction companies are bidding aggressively for large regional projects in growing emerging markets, which bear unique risks due to relatively difficult circumstances in the regulatory and operating environment; (3) rising raw material and payroll costs could result in cost overruns in particular in long term fixed price contracts. Given these trends, Moody's attributes great importance to the analysis of order quality and composition (see discussion of quality of orders under Factor 1). While the quality of orders is not an explicit rating factor for this methodology, the analysis provides important insights into a contractor's medium-term profitability and cash generation levels.

Effective risk management is essential to protect profit generation

Construction companies are characterised by a project-oriented work flow. The timing throughout the lifetime of a project of cash flows generated, costs occurred and revenues reported may vary, depending on the accounting method applied (Percentage of Completion or Completed-Contract-Method). As a consequence, final profitability and cash flow levels of current projects cannot be assessed before completion of a project.

There are multiple variables i.e. risks which determine a project's lifetime profitability and cash generation:

- One of the key drivers for a project's profitability is the bidding process. The majority of construction companies underline that they will not bid on projects below cost; however, the competitive nature of the bidding process drives companies to be aggressive. Because there are many variables in a cost calculation, e.g. estimates of price concessions from suppliers or subcontractors, the extent of add-on orders or the cost of warranty obligations, adverse surprises could occur. The complexity is exacerbated due to the fact that large companies are increasingly prepared to take on risks that historically have been avoided in order to differentiate their offerings and win major projects. For example, more companies are now willing to finance customers, invest in the projects or even run them for a certain time period.

Global Construction Methodology

- The construction contract, based on individual agreements or as a result of an initial tender process provides the legal framework of a project and heavily influences a project's lifetime profitability, in particular the agreement of "fixed-price" contracts or "cost-plus contracts". The contractual framework is the basis for potential legal risks due to contractual disputes which could include scope interpretation, delays and damages or changed contract pricing. Often, a contractor needs to provide performance bonds or letters of credit guaranteed by third-party institutions to function as an assurance for project completion.
- Project construction risks³ are among the risks which require substantial amounts of observation. Project construction i.e. completion risk include the risks of (1) cost overruns above an initial construction budget, which are in particular a threat in the case of fixed-price contracts, as compared to cost-plus contracts; and (2) time overruns in the case of delayed completion, which could be a result of general unreasonable construction schedules or a project's significant construction complexity. The complexity of a contractor's construction project is another important consideration which is not explicitly covered in this rating methodology given disclosure limitation of a contractor's order book, but which could be a fundamental part of the rating assessment in the construction industry (see section "Project Complexity" in other considerations). A higher level of complexity, e.g. the construction of complex civil infrastructure like tunnels compared to the construction of standard office buildings increases the threat of time or cost overruns for a construction company. Besides the construction complexity, project construction risks depend on the experience/track record of the contractor with the particular type of project being undertaken, reliance on new or unproven technologies and the degree to which local economic conditions around the project site will affect the cost and the availability of labour and materials over the construction period. Large projects could be exposed to regulatory or political risks if started in countries whose political, economic and/or legal systems are evolving.
- Customer credit risk: order parties of a construction project with a relatively weak credit profile or parties located in emerging countries lacking access to the international capital markets might need financial support during the project construction phase. Advance payments from customers are an important component since they signal the liquidity and solvency of the customers, thereby reducing the credit risk exposure for the construction company.

Information for contractor's ongoing projects are normally not publicly available, reducing the possibility of assessing a company's project risks on a comparable basis. While Moody's rating assessment does not include an extensive review of these risk elements on a project-by-project basis, Moody's aims to understand a company's risk management system. An effective risk management system has become one of the most important issues in recognising and managing risk and be rewarded for doing so. Effective risk management systems involve numerous independent controls operating at each stage of the project life cycle, with procedures on securing, managing and delivering projects, managing contract risk, pricing properly as well as, beyond project management, the independent monitoring of operation and business risk as well as fraud.

Substantial working capital needs require sound financial flexibility

While the construction industry is capital intense, the capital intensity is lower compared to other industries. However, due to the inevitable time difference between project construction and payment settlement, working capital fluctuations are often major components of cash flow from operations for both large and small construction companies - resulting in the need for sound financial flexibility. Smaller contractors in particular can be subject to major demands on cash from working capital needs because of delayed payments from major customers and/or increases in raw material costs and work in progress due to sudden, large changes in project schedules.

In most jurisdictions, revenues and profits on long-term construction contracts are accounted for over the life of the project using the percentage of completion method, albeit with varying thresholds depending on the measurement of project completion. Hence, a construction company's reported operating performance shows a constant deviation between "reported" profitability and cash generation, due to profit recognition methods which do not necessarily reflect payment streams of the projects workflow.

³ See Moody's Request for Comment, "Construction Risk in Privately-Financed Public Infrastructure Projects", August 2006, # 98409.

Global Construction Methodology

The construction industry sees large working capital swings not only due to payments received upon completion of major milestones for long-term projects but also due to the utilisation of a complex array of advance payments made by the customer. The ability to extract advance payments from customers is, however, related to the degree of customisation of the project. Large projects are usually designed for a particular purpose, which would make it difficult to find another user in the event of a customer default. Hence, contractors expect order parties to demonstrate their commitment to a project by pre-funding its construction. These payments and obligations can appear on balance sheet as deposits, payments in excess of costs and often in other liabilities. Advance payments also signal the liquidity and solvency of the customers, thereby reducing the customer credit risk exposure for the construction company.

Key Rating Issues going into the next decade

As business models shift beyond pure construction this provides revenue diversification but also brings new risks

In order to reduce the volatility of their business models, the majority of the global construction companies have developed their models over the past few years beyond construction services, mostly into pre- and post-construction valued-added services. The most popular segments added are (1) real estate development; (2) project operations and project finance, (3) asset management and (4) facility management. While activities in these sub-segments could produce more diversification and more predictable cash flow streams than lumpy construction orders, they can also require substantial investments and hence funding needs.

- **Real Estate development:** covers the purchase of 'raw' land, pursuing construction activities but also covering commercial risk of the disposal of realised construction projects. Hence real estate development requires higher funding needs to finance the time period between land purchase, construction, operation and disposal, but also introduces a new set of risks and adds to the cyclical vulnerability of such companies.
- **Project Operations, Project Finance:** Project operations and Project Finance have been increasingly popular. **Public Private Partnerships** have been used extensively to finance the construction and operation of public infrastructure in the UK, Australia, Canada, and increasingly in Europe and Japan. These projects are usually distinguished from traditional government procurement arrangements by the fact that they are designed to shift certain financing, construction and operating risks for public infrastructure projects to the private sector, in particular to construction companies. They feature fixed-price, fixed-term construction contracts and incorporate a requirement to operate the completed facilities pursuant to pre-agreed performance standards over a long-term concession agreement. While these offer additional revenue and earning sources, they are not without ongoing risk and it is possible that the balance of risk and reward may fluctuate significantly over the life of any underlying project.
- **Asset management** is also of growing importance. Lend Lease for instance transfers a number of completed projects (mostly retail centers) into their managed funds portfolio, providing the company with the control over the transfer process and a strategic stake in the funds going forward with benefits of relatively stable funds and property management fee earnings stream. Most of the Asian construction companies have also built up sizeable cross shareholdings in industrial companies, providing them with a source of order intake but also with a good source of alternate funding.
- **Facility management** requires general service and maintenance networks with a substantial amount of fixed costs that need to be spread across a large number of customer contracts with similar service needs. Key benefit of facility management contracts is a relatively stable and reliable revenue stream over a long term time period.

About This Rating Methodology

This methodology does not provide an explanation of every rating element considered in every instance, but it should enable the reader to understand the factors and financial ratios that weigh the most in this industry.

Global Construction Methodology

In addition to the five major factors discussed in this report, Moody's considers other qualitative factors which either cannot be quantified or, at best, not in a meaningful manner. These factors, however, may represent important and in some cases overriding considerations. They are explained in the "Other Considerations" section. Significantly, this report does not elaborate on non industry-specific factors (for example, corporate governance and event risk) which, while important to our ratings, apply to nearly all rated corporations. These factors are discussed in separate publications in more depth.

Moody's approach to rating companies in the construction industry, as outlined in this global rating methodology, incorporates the following steps:

1. IDENTIFYING THE KEY RATING FACTORS

Moody's rating committees for construction companies focus on a number of key rating factors, which we identify and quantify in this report. A change in one or more of these factors, depending on its weighting, is likely to influence a company's overall business and financial risk. These are the key factors that Moody's considers to be major drivers in determining a rating for a company in the global construction industry:

1. Scale and Stability
2. Business Profile
3. Operating Efficiency and Cost Position
4. Liquidity and Capital Structure
5. Financial Strength

Each of the five factors contains between two and four sub-factors, which comprise the components viewed as most important in assessing the credit quality of construction issuers.

2. MEASURING THE FIVE KEY RATING FACTORS

We next identify the metrics ("sub-factors") by which we measure performance on each of the five factors. In total there are 18 sub-factors. Any change in one or more of these factors is likely to influence the overall business and financial risk assessment incorporated in a rating.

Moody's ratings are forward-looking and attempt to rate through the industry's expected earnings volatility. The rating process does, however, make extensive use of historical financial statements. Historical results help us to understand the pattern of a company's results and how the company compares to its peers. They also allow both the company's and Moody's projections to be viewed in the context of past performances. While the rating process makes use of both historical and anticipated financial results, this document makes use only of historical financial data, and does so solely for illustrative purposes. Please note that for company-specific results listed in this publication we rely solely on public information, whereas actual rating decisions will also incorporate non-public data as applicable.

All of the quantitative measures incorporate Moody's standard adjustments to income statement, cash flow statement, and balance sheet amounts for (among others) off-balance sheet accounts receivable securitization programs, under-funded pension obligations, and recurring operating leases.⁴

3. APPLYING THE RATING METHODOLOGY / OUTLIER DISCUSSION

After identifying the measurement criteria for each factor, we match the performance on each factor and sub-factor to one of Moody's broad rating categories (Aaa, Aa, A, Baa, Ba, B and Caa). Each company is mapped to a rating for each of the 5 factors and for each of the 18 sub-factors. It is observed that a company may perform higher or lower on a specific factor than its actual rating level would otherwise indicate. These

⁴ Rating Methodology: Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations - Part I & II & III.

Global Construction Methodology

companies are identified as “outliers” for that factor. A company whose performance on a specific factor is two or more rating categories higher than its rating is deemed a positive outlier for that factor. A company whose performance is two or more rating categories below is deemed a negative outlier. This document provides discussion of the general reasons for such outliers for each factor.

4. DETERMINING THE FINAL RATING

To determine the overall rating, each of the 18 assigned sub-factor ratings is converted into a numeric value based on the following scale:

Aaa	Aa	A	Baa	Ba	B	Caa
1	3	6	9	12	15	18

Each sub-factor's numeric value is multiplied by an assigned weight and then summed. The sub-factor weights are as shown in the table below, and add up to 100%.

Factor Weighting			
Rating Factors	Factor Weighting	Relevant Sub-Factor	Sub-Factor Weighting
Scale and Stability	20%	Total Revenue	10%
		Revenue Variability	4%
		Order Backlog	6%
Business Profile Assessment	25%	Market Position & Barriers to Entry	6%
		Geographic Diversity	4%
		Segment Diversity	8%
		Project Concentration	7%
Operating Efficiency	15%	EBITA - Margin	4%
		Return on Assets	4%
		Earnings Volatility	7%
Liquidity and Capital Structure	20%	Debt / Book Capital	5%
		Debt / EBITDA	4%
		Liquidity Assessment	7%
		Change in Working Capital / Cash From Operations	4%
Financial Strength	20%	EBITA to Interest Expenses	8%
		Retained Cash Flow / Net Debt	4%
		(Retained Cash Flow - Capex)/Debt	4%
		Cash From Operations / Debt	4%
Total	100%		100%

Global Construction Methodology

The total sum of the factors is then mapped to the ranges specified in the Exhibit below, and the indicated alpha-numeric rating is determined based on where the total score falls in the range.

Factor Numerics			
Composite Rating		Sub-Factor Rating	
Indicated Rating	Aggregate Weighted Total Factor Score	Indicated Rating	Factor Score
Aaa	x < 1.5	Aaa	1
Aa1	1.5 < 2.5		
Aa2	2.5 < 3.5	Aa	3
Aa3	3.5 < 4.5		
A1	4.5 < 5.5		
A2	5.5 < 6.5	A	6
A3	6.5 < 7.5		
Baa1	7.5 < 8.5		
Baa2	8.5 < 9.5	Baa	9
Baa3	9.5 < 10.5		
Ba1	10.5 < 11.5		
Ba2	11.5 < 12.5	Ba	12
Ba3	12.5 < 13.5		
B1	13.5 < 14.5		
B2	14.5 < 15.5	B	15
B3	15.5 < 16.5		
Caa1	16.5 < 17.5		
Caa2	17.5 < 18.5	Caa	18
Caa3	18.5 < 19.5		

The Key Rating Factors

RATING FACTOR 1: SCALE AND STABILITY (20% Weighting)

Why it Matters

Scale – Total Revenues

The scale of a construction company's core business segments is considered to be a determinant of i) relative market strength, ii) operating flexibility and in particular of iii) the ability and expertise to undertake large, long-term, complex contracts with a broad level of variety. These criteria underpin a company's competitive position and its construction expertise that in turn helps it to win bids for major construction projects. The size of a business in the construction industry should also have a positive bearing on other key rating factors, such as geographic and product diversification, or the ability to manage and fund long-term turnkey projects.

Large construction companies also typically maintain relationships with a more diverse set of customers, which not only serves to enhance the company's market credibility (and, by extension, its sales) but also enables the company to establish its reputation as an organisation that can accommodate a broad range of construction needs. On the other hand, size provides the ability to build and maintain a sizeable network of subcontractors - a key competitive advantage in the industry. In general contracting, larger-scale Tier 1 companies agree to

Global Construction Methodology

supply a turnkey project as a general contractor, but many of the project phases are done by Tier 2 subcontractors while the remaining share of the construction volume done by the Tier 1 contractors may actually be small.

On the one hand a high level of subcontracting reduces the profitability potential to be generated by Tier 1 contractors. On the other hand, subcontracting provides benefits by increasing operating flexibility and hence operating performance stability through the cycle, considering the greater flexibility to adjust the construction capacity by changing the volumes subcontracted. Nevertheless profitability levels of Tier 1 contractors remain exposed to the full construction completion risk they bear, albeit with recourse to subcontractors.

Revenue Variability

In a business where regional cyclical swings in demand heavily influence revenues, it is considered that those construction companies showing only low geographic diversity and a low degree of segmental and project diversity will show higher revenue volatility than more diversified companies. Higher volatility could also reflect varying success in tender-bidding activity. Moreover, a high level of revenue variability may be the result of high revenue growth. While the benefits of a profitable revenue growth are reflected in the sub-factor scale or profitability, the sub-factor revenue variability measures the general risks to manage the growth on a sustained basis, in particular the challenge to match the benefits from a rising output volume with the changes of a company's cost base. Exceptionally strong revenue growth may be a sign of aggressive acquisition activity, which would bear integration risk and therefore score negatively on this ratio. Also companies with higher exposure to rapidly growing emerging markets are likely to show comparatively high revenue growth patterns but are also more exposed to higher volatility.

Order backlog

Order trends, particularly if steady, give an indication about the sustainability of a company's business volumes and its ability to secure workload. The order backlog figure provides medium-term revenue visibility, reflecting unrecognised revenues to be realised from uncompleted construction contracts.

Quality of Order Backlog / New Order intake

Although the ability to gain new orders as measured with the rating factor "order backlog" is essential in the project-oriented construction industry to determine medium-term volumes i.e. revenues, an assessment of the **quality of order** is decisive in determining a contractor's medium-term profitability levels. The quality of order intake is not an explicit rating factor for this methodology due to the limited public disclosure requirements of a contractor's order book; however, the profitability impact could affect Moody's estimates of forward-looking financial metrics.

While Moody's looks at order quality e.g. by assessing customer concentration (Factor 2) to determine order- (i.e. project) concentration risks, we also aim to look at (1) the percentage of business secured through competitive bidding or referral work from existing relationships; (2) the margin content of the order backlog, which is considered as far as possible in expected financial ratios; (3) the proportion of fixed-price to cost-plus contracts and the likelihood of budget overruns; (4) project duration; and, in particular, (5) the raw construction risk in a company's order book which is associated with the project's complexity (see "other considerations" P. 25 for a description of construction complexity levels). Nevertheless, we note that the impact of raw construction risk is dependent on a number of other factors: the contractual framework, the feasibility of a construction schedule, the quality of subcontractors involved, the contractors' experience, application of new technologies or processes on existing known construction spaces (e.g. road extension) or green-field sites or if construction is to take place in a challenging environment.

How We Measure it

Scale – Total Revenues: We use the most recent annual revenues in US dollars.

Revenue Variability: Revenue volatility over the past five years measured as the standard deviation of five years of revenues in local currency divided by the average of five years' revenues.

Order Backlog: Reported total backlog divided by revenue in the construction segment.

Global Construction Methodology

Criteria for Mapping Factor 1: Scale and Stability
(Weighting 20%)

	Sub-Factor	Sub-Factor Weighting	Aaa	Aa	A	Baa	Ba	B	Caa
1- SCALE AND STABILITY (Weighting 20%)	Total Revenues	10.0%	> 12	10-12	8-10	5-8	3.5-5	1.5-3.5	< 1.5
	Revenue variability	4.0%	<5%	5-7.5%	7.5-10%	10-20%	20-30%	30-40%	>40%
	Order Backlog	6.0%	>3	2.3-3.0	1.6-2.3	1.0-1.6	0.8-1.0	0.5-0.8	<0.5

Results of Mapping Factor 1 - Scale and Stability

	Current Rating	Mapped Score for Scale and Stability	Total Revenues	Revenue variability	Order backlog
Factor Weighting			10%	4%	6%
Fluor Corporation	A3	A	Aaa	Ba	Baa
Kajima Corporation	Baa1	Aa	Aaa	Aa	Baa
Leighton Holdings Limited	Baa1	Baa	A	B	Baa
GS Engineering & Construction	Baa1	Baa	Baa	Ba	Aa
Taisei Corporation	Baa2	Aa	Aaa	Aaa	Baa
Larsen & Toubro	Baa2	Baa	Ba	Ba	A
Obrascon Huarte Lain	Baa3	Baa	Ba	Ba	A
Maeda Corporation	Baa3	Baa	Ba	Aaa	Baa
Lend Lease Corporation Limited	Baa3	A	Aa	Baa	Baa
EMCOR Group, Inc.	Ba1	Baa	Baa	A	B
Penta-Ocean Construction Co., Ltd.	Ba2	Ba	B	Baa	Baa
The Shaw Group Inc.	Ba2	Baa	Ba	Ba	A
Dycom Industries, Inc.	Ba2	B	Caa	Ba	Baa
Foster Wheeler LLC	Ba3	Ba	B	Ba	Baa
MasTec, Inc.	Ba3	Baa	Caa	Aa	Baa
Quanta Services, Inc.	Ba3	B	B	Baa	B
Positive Outlier					
Negative Outlier					

Observations and Outliers

Kajima and Taisei are positive outliers for the Factor Scale and Stability, in particular as a result of their absolute scale and a good level of revenue stability. While these credits score favorably under this factor, the ratings are constrained by relatively high leverage levels (see Outlier discussion for Factor 4 and 5). The Japanese construction companies score all relatively high under the sub-factor Revenue variability, which reflects their ability to generate a constant level of orders through the cycle. On the other hand, these companies have a low sub-factor rating for Profitability (see Outlier discussion for Factor 3), which somewhat reflects the intense competitive environment in the Japanese construction market.

Global Construction Methodology

RATING FACTOR 2: BUSINESS PROFILE (25% Weighting)

Why it matters

The business profile is an important indicator of credit quality in the highly cyclical and competitive construction industry. A company's market position and barriers to entry, geographical, segmental and project diversification, are therefore expected to lead to stability in cash flow and margins despite the generally cyclical patterns in the construction industry.

There are four sub-factors which are mapped to a specific rating:

Market Position & Barriers to Entry

The rather qualitative assessment of a contractor's market position and barriers to entry is of importance to assess the sustainability and defensibility of a contractor's business model. A strong market position and barriers to entry in a regional market or segment implies more robust contract pricing power against customers and purchasing power against subcontractors and increases the likelihood of winning tenders for new contracts.

Diversification

The impact of cyclicity in any given market can be mitigated by diversification across regions, segments or projects i.e. customers. The prime benefits of a large and diversified business mix should be captured by low revenue volatility and solid profit margins. Revenue volatility is addressed in Rating Factor 1; operating efficiency and profitability are discussed in Rating Factor 3.

- **Geographical diversification** is viewed a positive factor because it reduces: (i) the company's vulnerability to the vagaries of a single region, (ii) the impact of economic cyclicity in individual regions, and (iii) the impact of regional regulatory, environmental or safety issues. Geographic diversity is usually a plus in that it may smooth volatility by balancing slower and higher growth markets, regional economic swings, and seasonal or weather-related fluctuations in cash flows. Benefits from scale generated from a high level of geographical diversification are rather limited for construction companies compared to manufacturing companies (which explains the relatively low weighting (4%) of this sub-factor compared to other Industry Rating Methodologies), given that unique local circumstances, e.g. unique regulatory requirements or the need to build up a local subcontractor network, limit the potential for economies of scale. Only a limited number of construction companies have been ultimately successful to organically diversify their operations into new markets. In particular diversification activities towards emerging or riskier markets is often a negative factor for the ratings because of the greater volatility and, sometimes, economic and currency risks associated with these markets as well as varying degrees of regulation. We generally expect companies operating predominantly in emerging markets to have stronger franchise characteristics and financial metrics than those operating in more stable markets for the same rating level.
- **Segmental diversification** balances and offsets exposure to the volatility of demand and price competition in particular segments. However, the effectiveness of segmental diversification has to be carefully analysed with regard to the correlation of individual segments. In particular, segments outside the construction business could be very effective, as evidenced by the number of contractors which have evolved their business model outside the cyclical construction industry, e.g. towards facility management. We note that the definition of business segments may differ from one company to the next, according to strategic focus or construction services groupings; this sometimes hinders Moody's ability to compare data. While the number of business segments cited in annual reports usually serves as a good indicator of segmental diversity, it is at the analyst's discretion to define virtual segments based on the level of correlation.

Global Construction Methodology

- Project/Customer diversification** measures the degree to which a company relies on a single customer or project in its orders on hand. Large projects or customers that make up a meaningful share of a company's business volume create significant concentration risks. Since these projects are often tailored to a particular customer's needs, the specific and unique construction can result in material cost overruns. This risk is increased if a company acts as a general contractor and is ultimately liable for a subcontractor's contribution.

Broad project diversification is important to lower the effect of project completion risks and to minimise the impact of earnings volatility (covered in Factor 3), considering the threat of cost overruns for fixed price contracts.

Broad customer diversification from a forward-looking perspective reduces the dependence on the order flow from individual customers. It also lowers the threat of customer credit risk - the default of an important customer can seriously impair the financial flexibility of a contractor. In such cases, the value of the uncompleted project is usually much lower than the receivable from the customer and a substantial loss can be expected. In this context, public customer contracts are often of lower margin but lower credit risk, whereas private customer contracts provide higher margins but also a higher default risk. Besides the assessment of customer concentration, customer credit risk is another important rating consideration which is not reflected as a separate rating factor in this methodology.

How We Measure It?

Market Position & Barriers to Entry: This factor includes the analysis of the relative market share in key markets and segments as well as an assessment of barriers to entry. There are several characteristics which provide barriers to entry in the construction sector. The three characteristics used to measure barriers to entry are:

- Market position as a general contractor, since the market is more concentrated and hence more stable for general contractors than for sub-contractors;
- Good track record for on-time and on-budget project management; and
- reputation for managing longer-term projects with a high degree of complexity and technological competence.⁵

In some markets, the need for regulatory qualifications by local authorities could function as another important barrier to entry.

Geographic revenue mix: The highest level is when no single region generates more than 40% of a group's revenues. The lowest category would be local players in a market of relatively small size. We define markets either as countries that are somewhat homogeneous in terms of economy, regulatory environment, weather/geography, or as smaller regions with similar characteristics within larger, or more diverse countries (as the US or Russia).

Segmental diversification: Number of segments. A segment is defined as a business line that represents more than 10% of revenues. Large corporations tend to group more diverse products in one segment to avoid reporting burdens and often also to group stronger and weaker operations for a positive segment performance. Smaller companies may present more narrowly defined segments to imply diversification. To mitigate this effect, we count only segments that account for more than 10% of group revenues.

Project Concentration: Percentage of revenue of the top three customers or contracts, whichever number is larger. Scorings are based on Moody's estimates for companies which do not disclose project or customer concentration information.

⁵ A definition of Project Complexity is covered in the section "other industry considerations".

Global Construction Methodology

Criteria for Mapping Factor 2: Business Profile Assessment (Weighting 25%)

Sub-Factor	Sub-Factor Weighting	Aaa	Aa	A	Baa	Ba	B	Caa
Market Position & Barriers to entry. (Barriers to entry: 1) Market Position as General Contractor, 2) Good Project Management Reputation, 3) Complex Projects	6.0%	#1 or # 2 in majority of segments in key markets. Majority of revenues protected by 3 Levels of barriers to entry.	#1 or # 2 in majority of segments in key markets. Majority of revenues protected by 2 Levels of barriers to entry.	Among Top 3 in core markets/ segments. Majority of revenues protected by at least 2 Levels of barriers to entry.	#3-5 in fragmented markets/ segments. Revenues somewhat protected by at least two barriers to entry.	#3-5 in fragmented markets/ segments. Revenues somewhat protected by at least two barriers to entry or well protected by at least one.	Niche player. Revenues may be somewhat protected by one barrier to entry.	Niche player. No barriers to entry.
Geographic diversity	4.0%	<40% sales to one major market country or region	40-50% sales to one major market country or region	50-60% sales to one major market or region	60-80% sales to one major market or region	>80-90% sales to one major market or region	>90% sales to one major market or region	>90% sales to one region of relative small absolute size
Segment diversity (Segments with > 10% of revenues)	8.0%	4 balanced, profitable core segments	3 balanced, profitable core segments	3 segments, varying in size or profitability	2 balanced and profitable segments.	2 segments, but heavily reliant on 1 segment (>80% of revenues generated in this segment)	2 segments, but heavily reliant on 1 segment (>90% of revenues generated in one segment)	1 segment
Project Concentration	7.0%	top 3 customers/ projects/ contracts: < 3% of "construction related" revenues	top 3 customers/ projects/ contracts between 3-5% of revenues	top 3 customers/ projects/ contracts between 5-10% of revenues	top 3 customers/ projects/ contracts between 10-15% of revenues	top 3 customers/ projects/ contracts between 15-20% of revenues	top 3 customers/ projects/ contracts between 20-25% of revenues	above 25% of construction revenues normally based on 3 contracts and or customer

Results of Mapping Factor 2 - Business Profile Assessment

Company Name	Current Rating	Mapped Score for Business Profile Assessment	Market Position & Barriers to Entry	Geographic Diversity	Segment Diversity	Project Concentration
Factor Weighting			6%	4%	8%	7%
Fluor Corporation	A3	A	A	Aaa	A	A
Kajima Corporation	Baa1	A	Aaa	Ba	A	A
Leighton Holdings Limited	Baa1	A	Aa	Ba	Aa	Baa
GS Engineering & Construction	Baa1	Baa	A	Ba	A	B
Taisei Corporation	Baa2	A	Aaa	Ba	A	A
Larsen & Toubro	Baa2	Baa	Aa	B	A	Ba
Obrascon Huarte Lain	Baa3	A	Baa	A	A	A
Maeda Corporation	Baa3	Baa	Baa	B	Baa	Baa
Lend Lease Corporation Limited	Baa3	Baa	Baa	Aa	Baa	Baa
EMCOR Group, Inc.	Ba1	Baa	A	A	Baa	Baa
Penta-Ocean Construction Co., Ltd.	Ba2	Baa	Baa	Ba	Baa	Baa
The Shaw Group Inc.	Ba2	Baa	A	Baa	Baa	Ba
Dycom Industries, Inc.	Ba2	Ba	Baa	Ba	Ba	Caa
Foster Wheeler LLC	Ba3	Baa	A	A	Baa	Ba
MasTec, Inc.	Ba3	Ba	Baa	Ba	Ba	Caa
Quanta Services, Inc.	Ba3	Baa	A	Baa	Ba	Baa
Positive Outlier						
Negative Outlier						

Global Construction Methodology

Observations and Outliers

The Factor Business Profile Assessment does not show any outlier. On a sub-factor basis, the majority of the companies are positive outliers for Market Position and Barriers to Entry. The majority of Japanese Construction Companies show a weak positioning under the sub-factor Geographic Diversity, reflecting their concentration on the Japanese construction market. This weakness is somewhat mitigated by their relatively strong market position.

RATING FACTOR 3: Operating Efficiency (15% Weighting)

Why it matters

Given the industry's cyclical character, a company's ability to manage its overall cost structure and operating efficiency is a critical factor in the rating analysis. Factors that measure costs and operating efficiency help in assessing a company's ability to operate through economic downturns and its ability to service its debt.

In the context of construction companies, the stability of operating performance measures is exposed to project cost overruns or the economic impact of time overruns, apart from being also exposed to the top-line development (captured in the sub-factor revenue variability). In addition, if the company substantially fails to achieve certain performance standards as a standard of quality, it may be held responsible for costs resulting from such failure – often supported by performance guarantees provided for the benefit of its customers.

There are three sub-factors that Moody's focuses on when analysing the cost efficiency and profitability of construction companies:

- EBITA Margin
- Return on Assets
- Earnings Volatility

EBITA Margin

The EBITA margin is an important indicator of a company's ability to generate operating profit after the costs of capital asset replacements, as represented by its annual depreciation but before the amortization of goodwill and intangibles which do not need to be replaced to generate the same business volume in the future. EBITA includes income from associates and investments which most of the time reflect a construction-related income stream, as well as gross interest income. The latter is an important component of return since it reflects the income from invested advance payments received. Considering that customer prepayments function as pre-financing for certain projects and its interest potential is factored into the contract price, the interest earned can be considered an add-on to operating profit. EBITA includes recurring "other" income and expenses and excludes non-recurring "other" income and one-time charges.

Return on Assets

Return on assets provides a view of the efficiency of capital retained by the company. Asset efficiency needs to be closely monitored in comparison to revenue efficiency as indicated by the EBITA margin, in particular to understand structural differences - which could be for instance a result of differing levels of vertical integration of construction companies. Typically, a high level of subcontracting could result in relatively low EBITA-margin levels but on the other hand provides benefits of relatively high operating flexibility and asset efficiency due to lower capital invested.

Earnings Volatility

Earnings for construction companies are typically more volatile than for other industries. In relatively short periods of time, such volatility can materially change a company's level of profitability, cash generation capacity, financial flexibility and debt service capacity. Key sources of earnings volatility are revenue volatility as such, inability to pass on rising input costs on fixed price contracts, project completion delays, write-downs

Global Construction Methodology

on projects/concessions or project disputes as a result of performance deviations. Earnings volatility provides insight into a company's general business volatility but also provides an assessment about a company's operating flexibility and management's ability to manage volatility.

How We Measure it

EBITA Margin: A three-year average of annual EBITA divided by annual revenue.

Return on Average Assets: In each of the last three years, where available, EBITA is divided by the average of the current and last year's assets and the resulting group of ratios is averaged into a single metric.

Earnings volatility: Trend of yearly percentage change in absolute EBITA over the last 5 years or occurrence of EBITA – losses.

Criteria for Mapping Factor 3: Operating Efficiency (Weighting 15%)

Sub-Factor	Sub-Factor Weighting	Aaa	Aa	A	Baa	Ba	B	Caa
EBITA-Margins	4.0%	>12%	10-12%	8-10%	6-8%	2.5-6%	1-2.5%	<1%
Return on Assets	4.0%	>12%	10-12%	8-10%	6-8%	2.5-6%	1-2.5%	<1%
Earnings Volatility	7.0%	EBITA increase of at least 10% every year	EBITA increase of at least 5% every year	EBITA increased between 0-5%	EBITA remains flat or increases with no more than 1yr decline of 20% or less	EBITA remains flat or increases with no more than a 1yr decline between 20%-30%	EBITA decline in 2 or more years with < 30% in any 1 year or 1 year of EBITA losses	EBITA decline in 2 or more years with > 30% in any 1 year, or 2 years of EBITA losses

Results of Mapping Factor 3 - Operating Efficiency

Company Name	Current Rating	Mapped Score for Operating Efficiency	EBITA-Margins	Return on Assets	Earnings Volatility
Factor Weighting			4%	4%	7%
Fluor Corporation	A3	Baa	Ba	A	A
Kajima Corporation	Baa1	Ba	Ba	Ba	Baa
Leighton Holdings Limited	Baa1	Baa	Ba	Aa	Baa
GS Engineering & Construction	Baa1	Baa	Baa	A	Baa
Taisei Corporation	Baa2	Ba	Ba	Ba	B
Larsen & Toubro	Baa2	Aaa	Aaa	Aaa	Aaa
Obrascon Huarte Lain	Baa3	Aa	A	Baa	Aaa
Maeda Corporation	Baa3	B	Ba	B	Caa
Lend Lease Corporation Limited	Baa3	Ba	Ba	Baa	Ba
EMCOR Group, Inc.	Ba1	B	B	Ba	Caa
Penta-Ocean Construction Co., Ltd.	Ba2	B	Ba	Ba	Caa
The Shaw Group Inc.	Ba2	Ba	Ba	Ba	B
Dycom Industries, Inc.	Ba2	Baa	Baa	Aa	B
Foster Wheeler LLC	Ba3	Ba	Baa	A	B
MasTec, Inc.	Ba3	B	Ba	Ba	Caa
Quanta Services, Inc.	Ba3	Ba	Ba	Ba	B
Positive Outlier					
Negative Outlier					

Global Construction Methodology

Observations and Outliers

Larsen & Toubro is a positive outlier for the Factor Operating Efficiency, reflecting its highly profitable growth generated over the last years and movement into higher margin sectors, however the current rating is constraint due to the potential for margin pressure as competition intensifies in key markets, particularly from international competitors.

Obrascon Huarte Lain is a positive outlier for the Factor Operating Efficiency, considering its good profitability levels and its low level of earnings volatility i.e. constant earnings growth, particularly recognizing the contributions of its portfolio of concession assets. While the profit contributions from OHL's concession business are supportive to the rating outcome, the high level of investment is reflected in a substantial rise in net non-recourse debt over the last years which is captured in rating factor 4 "Capital Structure".

On the other hand, Maeda is a negative outlier due to its volatile earnings track record but also its low EBITA Margins and Return on Assets.

RATING FACTOR 4: CAPITAL STRUCTURE AND LIQUIDITY (20% Weighting)

Why it matters

The financial policies of a construction company with respect to managing its capital structure and liquidity are significant to the rating outcome, as they provide insight into management's philosophy regarding the financial risk under which the company is willing to operate. A company's appetite for financial risk is considered in light of its specific business risk profile as well as the stability of its business model, both of which have been assessed in the previous factors (Factors 1-3).

Financial leverage is a key indicator of credit risk as it measures the degree to which a company has borrowed against future cash flow. In particular, analytical focus will be placed on actual and targeted capital structures. For example, the more modest a company's debt levels, the greater the financial flexibility it has for coping with the industry's cycles. Moody's closely analyses the type of debt, i.e. whether it is Recourse- or Non-recourse, with the specific tolerance levels being higher for non-recourse debt subject to the decision of the rating committee. The methodology uses two leverage ratios:

- **Debt to Capitalisation:** Debt to capitalisation is a simple way to compare the capital structures of companies operating within an industry. It also provides some insight into a company's financial policies and shareholder strategies, including its tolerance for debt levels. It is an important indicator for the cyclical construction industry in that it provides a snapshot of overall debt in the capital structure and, therefore, a window into a company's ability to ride out a downturn in performance.
- **Debt to EBITDA** is a measure that balances the debt to capitalisation ratio with the measurement of how debt exceeds the earnings generation capability of the company, as indicated by EBITDA.

Liquidity provides a measure of financial flexibility and hence the cushion that a company has to quickly meet known and unknown demands on cash, in particular highly volatile working capital needs but also in light of the company's debt maturity profile. A management's decision to hold cash and other reliable sources of liquidity, such as committed credit lines, may be an indication of liquidity planning and providing for unexpected liquidity needs which is supportive to the rating outcome. Liquidity is evaluated based on a qualitative assessment of the ability to manage liquidity needs and by analysing the key source of liquidity needs of construction companies, the volatility of working capital:

- **Liquidity Assessment:** Management of liquidity needs is important in the construction industry. Moody's looks at the quantity and quality of available liquidity sources versus annual, seasonal and medium-term liquidity needs to cover operational cash outflows, investment cash outflows, dividend payouts or maturing debt. Liquidity sources are cash available on hand, committed credit facilities or alternate sources. Moody's notes that construction companies' cash balances are typically characterised by management's tendency to hold high liquid reserves in different markets where the company operates to cover outflows due to

Global Construction Methodology

project risks, but in particular to offset potential volatility in working capital requirements which are highly affected by customer advance payments (which are however not considered to be a liquid, readily available source of cash for liquidity and debt repayment purposes). While Moody's neither deducts advance payments received from cash positions, nor adjusts these as financial debt, the quality of a company's liquidity is generally assessed as relatively weaker in case of a high proportion of a company's on-balance-sheet cash position being funded with advance payments received.

An investment-grade company will typically have access to a range of liquidity sources including credit facilities, commercial paper programmes and non-core assets, which could also consist of popular cross-shareholdings as seen for Japanese construction companies or concession assets, e.g. Obrascon Huarte Lain's Toll road investment. Non-investment-grade companies are more likely to evidence an increased reliance on a narrower set of conditional sources of liquidity, a lower covenant cushion and limited access to capital markets. In emerging markets, where committed credit facilities are not usual, maintenance of an adequate cash position is looked for by Moody's.

Bonding Capacity:

An assessment of a contractor's bonding capacity is another important element to determine a contractor's financial flexibility. Customers often require contractors to obtain advance payment guarantees from banks as well as insurance bonds for completion and/or performance on the project. Therefore, a contractor's bonding capacity is critical to ensure revenue growth but also in order to tap advance payments as a liquidity source. Common types of support include bank letters of credit, bank guarantees and demand deposits at regulated financial institutions. Common types of performance supports include bid bonds, performance bonds, sub-contractor insurance and completion insurance. Even though a contractor's bonding capacity is not an explicit sub-factor for the purpose of this rating methodology, Moody's closely monitors any changes in bonding capacity and the potential impact of a contractor's liquidity needs to support funding of operations.

- Working Capital Changes as a Percentage of Cash Flow from Operations:** The variability of working capital as a percentage of Cash Flow from Operations is an important sub-factor to assess the impact of working capital swings on a contractor's liquidity needs. Working capital is affected by the receipt of large deposits/advance payments and payments received upon completion of major milestones for long-term projects. When assessing this impact, Moody's uses the absolute percentage of working capital change divided by CFO because we seek to measure the degree to which cash flow from operations and free cash flow are affected by working capital changes, not whether the change is a source or use of cash. Large changes, either as a source or use of funds, are an indication of greater long-run volatility in cash from operations and a distortion of the perceived ability of the enterprise to generate cash on an ongoing basis.

How We Measure it

While the definitions call for the use of debt numbers reported at the end of the fiscal year, Moody's factors in the impact of seasonality patterns in its analysis and, when deemed necessary, calculates the ratios using the Average Adjusted Debt in a certain business year in order to more appropriately reflect seasonal fluctuations in total adjusted debt.

- 1. Debt to Capitalisation:** The debt to capital ratio is based on the most recent fiscal year, dividing total debt by a company's book capitalisation.
- 2. Debt to EBITDA:** is measured by a three-year average of annual total debt divided by Earnings Before Interest, Taxes, Depreciation and Amortisation.
- 3. Liquidity Assessment:** Qualitative assessment of a company's liquidity cushion.
- 4. Working Capital as a Percentage of Cash Flow from Operations:** A three-year average of the annual ratio of absolute change in working capital divided by cash flow from operations.

Global Construction Methodology

Criteria for Mapping Factor 4: Capital Structure and Liquidity (Weighting 20%)

Sub-Factor	Sub-Factor Weighting	Aaa	Aa	A	Baa	Ba	B	Caa
Debt to Book Capital	5.0%	<10%	10-20%	20-30%	30-50%	50-60%	60-80%	>80%
Debt to EBITDA	4.0%	<0.5x	0.5-1x	1-2x	2-3x	3-4x	4-7x	>7x
Liquidity Assessment	7.0%	Excellent Liquidity Profile, significant on-balance sheet cash position, committed credit facilities, limited dependence on advance payments.	Strong Liquidity Profile. Internally generated cash flow generally sufficient to meet operating and capex requirements, though some short term funding may be necessary to cover working capital peaks.	Adequate Liquidity Profile, with unsecured borrowing sometimes necessary to cover seasonal gaps in either working capital or growth capex programs.	Liquidity is satisfactory: characterized by unsecured credit facilities utilized for peak working capital needs, and ability to internally finance most growth capex.	Liquidity reliant on highly-conditional sources of funds or asset sales; dependence on advance payments. Heavy debt financing of working capital and even maintenance capex necessary.	Liquidity is strained. Little access to public capital markets. Heavy reliance on secured bank debt as company manages cash quarter to quarter.	Liquidity virtually non-existent. No access to public capital markets.
Absolute Change in WC in % of CFO	4.0%	<5%	5-10%	10-15%	15-25%	25-45%	45-75%	>75%

Results of Mapping Factor 4 - Capital Structure and Liquidity

Company Name	Current Rating	Mapped Score for Capital Structure and Liquidity	Debt/Book Capital	Debt / EBITDA	Liquidity Assessment	Absolute Change in WC in % of CFO
Factor Weighting			5%	4%	7%	4%
Fluor Corporation	A3	Baa	Baa	Baa	Aa	Caa
Kajima Corporation	Baa1	Ba	B	Caa	A	Caa
Leighton Holdings Limited	Baa1	Baa	Ba	A	Baa	Baa
GS Engineering & Construction	Baa1	Baa	Baa	Baa	A	Caa
Taisei Corporation	Baa2	Ba	Ba	Caa	A	B
Larsen & Toubro	Baa2	Baa	Baa	A	Baa	B
Obrascon Huarte Lain	Baa3	Ba	B	B	Baa	Ba
Maeda Corporation	Baa3	Ba	Baa	Caa	A	Caa
Lend Lease Corporation Limited	Baa3	Baa	Baa	Baa	A	Caa
EMCOR Group, Inc.	Ba1	Baa	Baa	Baa	Aa	Ba
Penta-Ocean Construction Co., Ltd.	Ba2	B	B	Caa	Baa	Caa
The Shaw Group Inc.	Ba2	B	Baa	Ba	B	Caa
Dycom Industries, Inc.	Ba2	Baa	Baa	A	Ba	A
Foster Wheeler LLC	Ba3	Ba	Caa	Ba	Baa	Baa
MasTec, Inc.	Ba3	B	Ba	B	Ba	Caa
Quanta Services, Inc.	Ba3	Ba	Ba	B	A	Ba
Positive Outlier						
Negative Outlier						

Global Construction Methodology

Observations and Outliers

The Factor Capital Structure and Liquidity shows no outlier, on a sub-factor basis the majority of the global construction companies are characterised as an outlier for the sub-factor "Absolute change in WC in % of Cash From Operations". This sub-factor is however a very typical rating constraint in the construction industry. A good liquidity assessment however outweighs for most of the companies the impact of these volatile working capital patterns.

Another observation on a sub-factor level is linked to the relatively high leverage ratios of all Japanese construction companies (Kajima, Taisei, Maeda, Penta-Ocean), which are negative outliers for the sub-factors Debt / Book capital and/or Debt / EBITDA. These credits benefit from a favorable assessment of their Scale and Stability as well as a beneficial assessment of their Business Profile.

Obrascon Huarte Lain's capital structure is relatively highly leveraged, reflecting mainly the large annual capital investment it makes in growing its concessions portfolio, and the increase in non-recourse debt used to finance this.

RATING FACTOR 5: FINANCIAL STRENGTH (20% Weighting)

Why it matters

Companies in the highly cyclical construction industry need to generate sufficient earnings and cash flow to cover interest expenses, debt repayments, working capital needs, capital expenditure or investment, in addition to dividends. The four key indicators we use to measure financial strength are: (i) interest coverage, (ii) retained cash flow relative to net debt, (iii) cash flow from operation to debt, and (iv) free cash flow relative to debt.

Interest coverage: The use of EBITA in the interest coverage ratio is important for companies in this industry as they typically need to spend their depreciation over time on capex and therefore need to cover interest expenses with earnings after depreciation expense (EBITA). This is especially true if the interest rate environment is in a period of change - such as the migration from lower rates to higher rates - and an issuer is facing the need to refinance debt that is nearing maturity. For higher-rated companies, this metric is viewed more as a proxy for financial flexibility although interest coverage can be particularly meaningful for speculative-grade companies.

Cash Flow to debt coverage ratios

Cash Flow to debt coverage ratios are assessed from different angles, namely before and after working capital payouts, before and after dividend payouts but also before and after capex in order to evaluate the amount of cash flow available to cover varied scenarios of both operating needs and financing needs. The cushion or shortfall measured by these ratios speaks to a company's ability to cover scheduled debt amortisation with internally generated funds and addresses its flexibility to alter its capital structure through voluntary debt repayments.

- **Retained Cash Flow to net debt:** is a broader measure of financial flexibility than free cash flow as it excludes the potential 'noise' created by changes in working capital and unusual capital spending programmes but it considers financial policies in terms of shareholder orientation by taking into account dividend payouts. This ratio is mapped with net debt (i.e. gross debt minus cash and cash equivalents), recognising that a number of companies in the construction sector maintain high levels of cash rather than use it to retire debt.
- **Retained Cash Flow – Capex to debt:** This ratio reflects a company's primary source of liquidity generated to cover gross debt, as it directly speaks to management's ability to service its debt burden after considering both financial commitments to shareholders and operating needs to fund capital expenditures but excluding volatile working capital swings.

Global Construction Methodology

- **Cash Flow from Operations to debt:** measures the financial flexibility considering funds from operations after often volatile working capital needs in relation to gross debt.

Due to the sometimes transitory nature of cash, Moody's looks at gross debt when calculating the cash flow to debt coverage of Cash Flow From Operations and Free Cash Flow (RCF-Capex). Hence, Moody's takes into consideration:

- Cash balances are partly working cash which needs to remain in the business.
- Moreover, cash may be in subsidiaries or jurisdictions in which friction costs (e.g. income taxes, withholding taxes) can make it inappropriate to use net debt. Furthermore, there could be covenant restrictions limiting the ability of cash to go upstream into holding companies.
- In Europe and emerging markets in general, a number of companies prefer to centralise cash balances on the books of the holding company, while maintaining debt at the subsidiary level.

How We Measure it

Interest Coverage: The three-year average of EBITA divided by gross interest expense.

Debt Coverage Ratios

Moody's looks at seasonal swings of debt through a business year. For the purpose of this methodology, we have applied year-end figures to ensure comparability across the industry.

Retained Cash Flow to Net Debt: The three-year average of funds from operations less dividends divided by net debt, calculated as the average of the past three years.

RCF – Capex to Debt: The three-year average of retained cash flow (pre-working capital) minus capital expenditure and dividends divided by gross debt

Cash Flow From Operations to Debt: The three-year average of funds from operations plus working capital movements divided by the average gross debt of the past three years.

Criteria for Mapping Factor 5: Financial Strength (Weighting 20%)

Sub-Factor	Sub-Factor Weighting	Aaa	Aa	A	Baa	Ba	B	Caa
EBITA to Interest Expense	8.0%	>10x	8-10x	6-8x	4-6x	3-4x	1-3x	<1x
RCF / Net Debt	4.0%	>100%	75-100%	40-75%	20-40%	8-20%	3-8%	<3%
(RCF - Capex) / Debt	4.0%	>40%	30-40%	20-30%a	6-20%	3-6%	1-3%	<1%
CFO / Debt	4.0%	>60%	40-60%	30-40%	10-30%	5-10%	2-5%	<2%

Global Construction Methodology

Results of Mapping Factor 5 - Financial Strength

Company Name	Current Rating	Mapped Score for Financial Strength	EBITA / Interest Expenses	RCF / Net Debt	(RCF-Capex) / Debt	CFO / Debt
Factor Weighting			8%	4%	4%	4%
Fluor Corporation	A3	A	A	Aa	Ba	Baa
Kajima Corporation	Baa1	Ba	Baa	Ba	Ba	Ba
Leighton Holdings Limited	Baa1	A	A	Aaa	Caa	Aaa
GS Engineering & Construction	Baa1	A	Aaa	Baa	Baa	Baa
Taisei Corporation	Baa2	Baa	A	Ba	Baa	Ba
Larsen & Toubro	Baa2	Baa	Aa	Baa	Caa	Baa
Obrascon Huarte Lain	Baa3	B	B	Ba	Caa	Baa
Maeda Corporation	Baa3	B	Ba	B	Caa	B
Lend Lease Corporation Limited	Baa3	Baa	Baa	Ba	Ba	Baa
EMCOR Group, Inc.	Ba1	Baa	Ba	A	Baa	Aa
Penta-Ocean Construction Co., Ltd.	Ba2	Ba	Ba	B	B	Ba
The Shaw Group Inc.	Ba2	Ba	B	Baa	Baa	Baa
Dycom Industries, Inc.	Ba2	A	Baa	A	Baa	Aa
Foster Wheeler LLC	Ba3	Baa	B	Aaa	Baa	Baa
MasTec, Inc.	Ba3	B	B	Ba	Caa	Ba
Quanta Services, Inc.	Ba3	Ba	B	Baa	Ba	Baa
Positive Outlier						
Negative Outlier						

Observations and Outliers

Dycom is a positive outlier for the Factor Financial Strength, reflecting the fact that the company benefits from relatively low financial leverage ratios, and good cash generation levels, which however is somewhat offset by a relatively weak business profile. On the other hand, the negative outlier Maeda has a highly leveraged capital structure, which is a key concern for the rating positioning. While Obrascon Huarte Lain's Capital Structure is highly leveraged as well, this is largely due to non-recourse debt stemming from expanding concession activities of Obrascon.

Other Rating Considerations

Although Moody's considers other factors in addition to those discussed above, in most cases the metrics presented herein will enable a good approximation of our view on the credit quality of companies in this sector. Moody's considers additional factors, including the future operating and financial performance that may deviate from the historical performance, the quality of management, corporate governance, financial controls, financial and accounting policies, acquisition strategies, event risk and seasonality. Risk management (outlined above in Industry Overview - Risk Management) is also a key factor for construction companies. The analysis of these factors remains an integral part of our rating process.

Management Quality

The quality of management is an important factor supporting a company's credit strength. Moody's meets with senior executives to assess management's business strategies, policies, and philosophies.

Global Construction Methodology

Once established, a record of consistency provides Moody's with insight into management's likely future performance in stressed situations and can be an indicator of management's tendency to depart significantly from its current business philosophy.

Corporate Governance

Among the areas of focus in corporate governance are audit committee financial expertise, the incentives created by executive compensation packages, related party transactions, interactions with outside auditors, and ownership structures.

Financial Controls

Moody's relies on the accuracy of audited financial statements to assign and monitor ratings. Such accuracy is only possible when companies have strong internal controls, including centralized, and consistency in accounting policies and procedures.

The new internal control attestation requirements under section 404 of the Sarbanes – Oxley act have improved the financial processes of most companies. In addition to Sarbanes Oxley compliance, we look for a knowledgeable internal audit department and overall focus on internal controls. Weakness in the overall financial reporting processes, financial statement restatements or delays in SEC filings are indications of a potential weakness or even breakdown in internal controls.

Acquisition Strategy

Acquisitions can make strategic sense and strengthen a company's business, particularly by filling out construction segments or service niches. Moody's assessment of a company's tolerance for acquisitions at a given rating level takes into consideration management's risk appetite, including the likelihood of further acquisitions over the medium term, its share-buy back activity, its commitment to specific leverage targets, and the volatility of the underlying businesses, as well as that of the business being acquired.

In general, depending on the strategic fit and the pro-forma capitalisation/leverage following an acquisition, and on Moody's confidence whether credit metrics - should they have weakened as a result of the transaction - can be restored in a relatively short time frame, ratings can hold after acquisitions, even if leverage climbs above normally acceptable ranges.

Event Risk

We also recognize the possibility that an unexpected event could cause a sudden and sharp decline in an issuer's fundamental credit worthiness. Typical special events include mergers and acquisitions, capital restructuring programs, litigation and large share repurchases.

Seasonality

Seasonality (i.e. movements through the year) is a particular concern for some, but not all, construction companies. Higher seasonality i.e. volatility creates less room for error in project execution.

Other industry-specific considerations

Debt Adjustments

The adjusted debt figure does not include performance bonds, bid bonds or obligations from letters of credit considering that these are simply a duplication of an existing obligation to honour the construction contract. Our assessment of a company's ability to honour its contracts is part of the business risk assessment, which will include the fact that some contracts inevitably result in losses. In addition, advance payments received are viewed as an element of working capital and hence are not adjusted as financial debt.

Global Construction Methodology

Project Complexity

The general level of project complexity determines the risk of on-time and on-budget project completion but also could contribute to a contractor's market position and barriers to entry in case complex projects have been successfully completed. The complexity of a contractor's construction projects is another important consideration which is not explicitly covered in this rating methodology. As far as possible, Moody's classifies the construction risk of a contractor's current construction portfolio based on a classification system defined in a study of the UK public procurement system conducted for the UK Treasury in 2002⁶. The four⁷ broad types are

- **Standard Buildings:** Buildings not requiring unique or other unusual design considerations. These include most office buildings, medical facilities, medium- and lower-security prisons as well as green-field airport terminal buildings.
- **Standard Civil Infrastructure:** Projects involving the construction of facilities, in addition to buildings, not requiring unique or unusual considerations, e.g. most new roads in areas without unusual geotechnical issues.
- **Complex Buildings:** Buildings requiring unique or unusual design considerations as a result of space constraints, complicated size characteristics and/or requirements to maintain services throughout the construction period. Generally, brown-field redevelopment or refurbishment projects will be categorised as complex. Other examples include general or speciality hospitals or high- security prisons.
- **Complex Civil Infrastructure:** Projects involving the construction of facilities, in addition to buildings, that require special design considerations as a result of space constraints, complex geotechnical issues and/or unusual output specifications. Also included are projects that incorporate innovative design, architectural or construction features or those that incorporate technically complex requirements such as bridges or roadways in difficult terrain, any tunnelling other than minimum amounts of "cut and cover" tunnels, and any projects requiring that existing services be maintained throughout the construction period.

Final Consideration

Appendix 1 illustrates the mapping and ratios for each of the measured factors as well as each company's overall implied rating using weightings as indicated in the Appendix. For each factor, we have highlighted favourable and unfavourable outliers of two or more full rating categories.

For the 16 construction companies analysed in this methodology, we make the following observations:

- The indicated ratings of 14 of the 16 companies (88%) either match the current rating or fall within one notch of it.
- 2 companies (12%) have indicated ratings that are two notches higher or lower than their current ratings.
- No company has an indicated rating that is three notches higher or lower than the existing rating.

⁶ Special Comment - Construction Risk in Privately Financed Infrastructure Projects, P. 15

⁷ See also Moody's Special Comment on Operating Risk in Privately Financed Infrastructure Projects, P.35-36 where the four categories are expanded to six.

Global Construction Methodology

Appendix 1 – Rating Grid

Factor	Sub-Factor	Sub-Factor Weighting	Aaa	Aa	A	Baa	Ba	B	Caa
1- SCALE AND STABILITY (Weighting 20%)	Scale - Total Revenues	10.0%	> 12	10-12	8-10	5-8	3.5-5	1.5-3.5	< 1.5
	Revenue variability	4.0%	<5%	5-7.5%	7.5-10%	10-20%	20-30%	30-40%	>40%
	Order Backlog	6.0%	>3	2.3-3.0	1.6-2.3	1.0-1.6	0.8-1.0	0.5-0.8	<0.5
2- BUSINESS PROFILE ASSESSMENT (Weighting 25%)	Market Position & Barriers to entry. (Barriers to entry: 1) Market Position as General Contractor, 2) Good Project Management Reputation, 3) Complex Projects)	6.0%	#1 or # 2 in majority of segments in key markets. Majority of revenues protected by 3 Levels of barriers to entry.	#1 or # 2 in majority of segments in key markets. Majority of revenues protected by 2 Levels of barriers to entry.	Among Top 3 in core markets/segments. Majority of revenues protected by at least 2 Levels of barriers to entry.	#3-5 in fragmented markets/segments. Revenues somewhat protected by at least two barriers to entry.	#3-5 in fragmented markets/segments. Revenues somewhat protected by at least two barriers to entry or well protected by at least one.	Niche player. Revenues may be somewhat protected by one barrier to entry.	Niche player. No barriers to entry.
	Geographic diversity	4.0%	<40% sales to one major market country or region	40-50% sales to one major market country or region	50-60% sales to one major market or region	60-80% sales to one major market or region	>80-90% sales to one major market or region	>90% sales to one major market or region	>90% sales to one region of relative small absolute size
	Segment diversity (Segment with > 10% of revenues)	8.0%	4 balanced, profitable core segments	3 balanced, profitable core segments	3 segments, varying in size or profitability	2 balanced and profitable segments.	2 segments, but heavily reliant on 1 segment (>80% of revenues generated in this segment)	2 segments, but heavily reliant on 1 segment (>90% of revenues generated in one segment)	1 segment
	Project Concentration	7.0%	top 3 customers/projects / contracts: < 3 % of "construction related" revenues	top 3 customers/projects / contracts between 3-5% of revenues	top 3 customers/projects / contracts between 5-10% of revenues	top 3 customers/projects / contracts between 10-15% of revenues	top 3 customers/projects / contracts between 15-20% of revenues	top 3 customers/projects / contracts between 20-25% of revenues	above 25 % of construction revenues normally based on 3 contracts and or customer
3- OPERATING EFFICIENCY (Weighting 15%)	EBITA-Margins	4.0%	>12%	10-12%	8-10%	6-8%	2.5-6%	1-2.5%	<1%
	Return on Assets	4.0%	>12%	10-12%	8-10%	6-8%	2.5-6%	1-2.5%	<1%
	Earnings Volatility	7.0%	EBITA increase of at least 10% every year	EBITA increase of at least 5% every year	EBITA increased between 0-5%	EBITA remains flat or increases with no more than 1yr decline of 20% or less	EBITA remains flat or increases with no more than a 1yr decline between 20%-30%	EBITA decline in 2 or more years with < 30% in any 1 year or 1 year of EBITA losses	EBITA decline in 2 or more years with > 30% in any 1 year, or 2 years of EBITA losses

Global Construction Methodology

Factor	Sub-Factor	Sub-Factor Weighting	Aaa	Aa	A	Baa	Ba	B	Caa
	Debt to Book Capital	5.0%	<10%	10-20%	20-30%	30-50%	50-60%	60-80%	>80%
	Debt to EBITDA	4.0%	<0.5x	0.5-1x	1-2x	2-3x	3-4x	4-7x	>7x
4- CAPITAL STRUCTURE AND LIQUIDITY (Weighting 20%)	Liquidity Assessment	7.0%	Excellent Liquidity Profile, significant on-balance sheet cash position, committed credit facilities, limited dependence on advance payments.	Strong Liquidity Profile. Internally generated cash flow generally sufficient to meet operating and capex requirements, though some short term funding may be necessary to cover working capital peaks.	Adequate Liquidity Profile, with unsecured borrowing sometimes necessary to cover seasonal gaps in either working capital or growth capex programs.	Liquidity is satisfactory: characterized by unsecured credit facilities utilized for peak working capital needs, and ability to internally finance most growth capex.	Liquidity reliant on highly-conditional sources of funds or asset sales; dependence on advance payments. Heavy debt financing of working capital and even maintenance capex necessary.	Liquidity is strained. Little access to public capital markets. Heavy reliance on secured bank debt as company manages cash quarter to quarter.	Liquidity virtually non-existent. No access to public capital markets.
	Absolute Change in WC in % of CFO	4.0%	<5%	5-10%	10-15%	15-25%	25-45%	45-75%	>75%
5- FINANCIAL STRENGTH (Weighting 20%)	EBITA to Interest Expense	8.0%	>10x	8-10x	6-8x	4-6x	3-4x	1-3x	<1x
	RCF / Net Debt	4.0%	>100%	75-100%	40-75%	20-40%	8-20%	3-8%	<3%
	(RCF - Capex) / Debt	4.0%	>40%	30-40%	20-30%	6-20%	3-6%	1-3%	<1%
	CFO / Debt	4.0%	>60%	40-60%	30-40%	10-30%	5-10%	2-5%	<2%

Global Construction Methodology

Appendix 2 – Consolidated Factor Mapping Results

	Factor 1 - Scale and Stability					Factor 2 - Business Profile Assessment				Factor 3 - Operating Efficiency			Factor 4 - Capital Structure and Liquidity				Factor 5 - Financial Strength			
	Current Rating	Model indicated Rating	Total Revenues 10%	Revenue variability 4%	Order backlog 6%	Market Position & Barriers to Entry 6%	Geographic Diversity 4%	Segment Diversity 8%	Project Concentration 7%	EBITA-Margins 4%	Return on Assets 4%	Earnings Volatility 7%	Debt/Book Capital 5%	Debt / EBITDA 4%	Liquidity Assessment 7%	Absolute Change in WC in % of CFO 4%	EBITA / Interest Expenses 8%	RCF / Net Debt 4%	(RCF-Capex) / Debt 4%	CFO / Debt 4%
Factor Weighting																				
Fluor Corporation	A3	A3	Aaa	Ba	Baa	A	Aaa	A	A	Ba	A	A	Baa	Baa	Aa	Caa	A	Aa	Ba	Baa
Kajima Corporation	Baa1	Baa2	Aaa	Aa	Baa	Aaa	Ba	A	A	Ba	Ba	Baa	B	Caa	A	Caa	Baa	Ba	Ba	Ba
Leighton Holdings Limited	Baa1	Baa1	A	B	Baa	Aa	Ba	Aa	Baa	Ba	Aa	Baa	Ba	A	Baa	Baa	A	Aaa	Caa	Aaa
GS Engineering & Construction	Baa1	Baa1	Baa	Ba	Aa	A	Ba	A	B	Baa	A	Baa	Baa	Baa	A	Caa	Aaa	Baa	Baa	Baa
Taisei Corporation	Baa2	Baa1	Aaa	Aaa	Baa	Aaa	Ba	A	A	Ba	Ba	B	Ba	Caa	A	B	A	Ba	Baa	Ba
Larsen & Toubro	Baa2	Baa1	Ba	Ba	A	Aa	B	A	Ba	Aaa	Aaa	Aaa	Baa	A	Baa	B	Aa	Baa	Caa	Baa
Obrascon Huarte Lain	Baa3	Baa3	Ba	Ba	A	Baa	A	A	A	A	Baa	Aaa	B	B	Baa	Ba	B	Ba	Caa	Baa
Maeda Corporation	Baa3	Ba2	Ba	Aaa	Baa	Baa	B	Baa	Baa	Ba	B	Caa	Baa	Caa	A	Caa	Ba	B	Caa	B
Lend Lease Corporation Limited	Baa3	Baa2	Aa	Baa	Baa	Baa	Aa	Baa	Baa	Ba	Baa	Ba	Baa	Baa	A	Caa	Baa	Ba	Ba	Baa
EMCOR Group, Inc.	Ba1	Baa3	Baa	A	B	A	A	Baa	Baa	B	Ba	Caa	Baa	Baa	Aa	Ba	Ba	A	Baa	Aa
Penta-Ocean Construction Co., Ltd.	Ba2	Ba2	B	Baa	Baa	Baa	Ba	Baa	Baa	Ba	Ba	Caa	B	Caa	Baa	Caa	Ba	B	B	Ba
The Shaw Group Inc.	Ba2	Ba1	Ba	Ba	A	A	Baa	Baa	Ba	Ba	Ba	B	Baa	Ba	B	Caa	B	Baa	Baa	Baa
Dycorn Industries, Inc.	Ba2	Ba1	Caa	Ba	Baa	Baa	Ba	Ba	Caa	Baa	Aa	B	Baa	A	Ba	A	Baa	A	Baa	Baa
Foster Wheeler LLC	Ba3	Ba1	B	Ba	Baa	A	A	Baa	Ba	Baa	Aa	B	Caa	Ba	Baa	Baa	Ba	Aaa	Baa	Baa
MasTec, Inc.	Ba3	Ba3	Caa	Aa	Baa	Baa	Ba	Ba	Caa	Ba	Ba	Caa	Ba	B	Ba	Caa	B	Ba	Caa	Ba
Quanta Services, Inc.	Ba3	Ba2	B	Baa	B	A	Baa	Ba	Baa	Ba	Ba	B	Ba	B	A	Ba	B	Baa	Ba	Baa
Positive Outlier																				
Negative Outlier																				

Global Construction Methodology

Moody's Related Research

Rating Methodology:

- Operational Toll Roads – 101003
- Homebuilding – 90996
- Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations - Part I - 96760
- Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations – Part II - 96729
- Moody's Approach to Global Standard Adjustments in the Analysis of Financial Statements for Non-Financial Corporations – Part III - 100276

Special Comment:

- Covenants and Ring-Fencing for Wholly-Owned Subsidiaries - 102983
- Request for Comment: Construction Risk in Privately Financed Infrastructure Projects (PFI/PPP/P3) Projects – 98409
- Request for Comment: Operating Risk in Privately Financed Infrastructure Projects (PFI/PPP/P3) Projects – 104538

To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

Global Construction Methodology

Authors

Christian Hendker, CFA
Johannes Wassenberg

Editor

Nick Ashwell

Production Associate

David Ainsworth

© Copyright 2007, Moody's Investors Service, Inc. and/or its licensors and affiliates including Moody's Assurance Company, Inc. (together, "MOODY'S"). All rights reserved. **ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.** All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, such information is provided "as is" without warranty of any kind and MOODY'S, in particular, makes no representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability or fitness for any particular purpose of any such information. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The credit ratings and financial reporting analysis observations, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. **NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.** Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, holding or selling.

MOODY'S hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MOODY'S have, prior to assignment of any rating, agreed to pay to MOODY'S for appraisal and rating services rendered by it fees ranging from \$1,500 to approximately \$2,400,000. Moody's Corporation (MCO) and its wholly-owned credit rating agency subsidiary, Moody's Investors Service (MIS), also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually on Moody's website at www.moody's.com under the heading "Shareholder Relations — Corporate Governance — Director and Shareholder Affiliation Policy."



Moody's Investors Service