Amid fast growth in stocks, industries, or regions, reported numbers demand particular scrutiny. For that reason, investors cannot neglect EM earnings quality (EQ). We present a scalable framework for systematic EQ analysis and apply it to 2,223 EM and DM stocks.

Our introductory report: Disappointed by the alarmist and anecdotal nature of some recent reports on EM earnings quality, we adopt a more rigorous and data-driven approach. In this report we analyze earnings quality in five prominent emerging market countries: Brazil, Russia, India, China, and South Africa. By introducing a working definition and scalable framework for earnings quality analysis, we also set the stage for future work on the long-term sustainability of companies’ return on capital across regions and industries.

Earnings quality, forecasting, and valuation: Investors’ perceptions of a company’s capacity to grow its earnings per share at a sustainable pace drive that company’s market multiple. The objective of earnings quality analysis is to assess the extent to which a company’s reported financials provide a sound basis for forecasting its future performance.

Our analysis: Starting from a set of individual signals motivated by the professional and academic literature, we construct a composite Earnings Quality Score (EQS) for each company in a sample of 2,223 non-financial BRICS and DM companies. We then use the EQS to look at differences in earnings quality between EM and DM at various levels of aggregation.

What we discovered: Within the limits of our sample and our scoring methodology, we find significantly lower earnings quality in EM vs. DM. The EM results are not driven by company size. Ranking country-industry group pairs by average EQS, we find that industries in China, India, and Brazil dominate the top 15 (indicating weaker earnings quality). At the country level, South Africa appears indistinguishable from DM in terms of EQS.
Executive Summary

What’s this report about?
Investors’ perceptions of a company’s capacity to grow its earnings per share at a sustainable pace drive that company’s market multiple. In forming their expectations of EPS growth, however, market participants must largely rely on company-reported financial statements. The objective of earnings quality analysis — in the broadest sense — is to assess the extent to which a company’s past and present reported financials provide a sound basis for forecasting its future performance. While not a forecasting exercise in itself, it is an essential analysis preceding such an exercise.

In this introductory report we analyze earnings quality in five prominent emerging market countries: Brazil, Russia, India, China, and South Africa. By introducing a working definition and framework for earnings quality analysis, we also set the stage for future work on the long-term sustainability of companies’ returns on capital.

Why Emerging Markets?
History has taught us — mostly the hard way — that when stocks, industries, or regions grow at extraordinary rates, investors are well advised to ramp up their scrutiny of reported numbers.

Exhibit 1
Aggregate BRICS GDP Growth 2000-2010

In no way are we representing that, because of their impressive growth, EM countries must be fertile ground for earnings quality issues a priori. Indeed, DM economies have seen their fair share of such issues. Having said that, the combination of spectacular growth, a number of recent EM earnings quality incidents, and the fact that EMs are widely viewed as the trade winds that can keep the global economy out of the doldrums, make EM earnings quality an issue that investors should not neglect (see Cross-Asset Navigator: Playing the 2-Track World, Morgan Stanley Research, August 18, 2011).

The objective of earnings quality analysis is to assess the extent to which a company’s past and present reported financials provide a sound basis for forecasting its future performance.

What’s different about our approach?
We have been disappointed by the alarmist and anecdotal nature of some recent reports on EM earnings quality. Ours is a more rigorous, data-driven exercise anchored in the widely respected academic and applied research on this complex topic. We would not want academic to be confused with non-commercial: In their systematic search for alpha signals, some of the world’s most prominent quantitative investment funds have been successfully applying the results of the empirical finance and accounting literature for at least two decades (see sidebar “Quants and Accruals” on page 8).

In addition to bringing quantitative rigor to the analysis of EM earnings quality, this report introduces a framework for future earnings quality research across regions, industries, and themes.

What have we found out?
Starting from 10 individual signals motivated by the professional and academic literature on earnings quality, we construct a composite Earnings Quality Score (EQS) for each company in a sample of 2,223 non-financial BRICS and DM companies. We control for differences in business models across the sample by calculating the EQS at the GICS sub-industry level. We then use the EQS to look at differences in earnings quality between EM and DM at various levels of aggregation.

At the most aggregate level we find a significant difference in earnings quality between EM and DM: The EQS distribution for EM companies is clearly skewed to the higher scores, indicating weaker average earnings quality for the EM companies in our sample. We also find that company size is not a determinant of the EQS for our EM sample, suggesting that investors need to think about earnings quality regardless of size.
Zooming in on the 5 BRICS countries, we find that the original BRIC countries achieve higher EQS (indicating weaker earnings quality) on average than the DM companies in our sample. South Africa, on the other hand, appears indistinguishable from DM as a whole in terms of EQS. We also rank country-industry group pairs by average EQS and find that Chinese, Indian, and Brazilian industry groups dominate the top 15. By contrast, no DM industry group ranks in this top 15.
What Exactly Do We Mean by *Earnings Quality*?

There is no shortage of definitions of *earnings quality*. Analysts, investors, issuers, regulators, accounting standard-setters, academics, and financial journalists have all made contributions over the years. As a result, the potential for confusion and talking at cross purposes is significant. It would be beyond the scope of this report to review all of these definitions and their often subtle distinctions. Instead, we refer the reader to an excellent review by Dechow, Ge, and Schrand.¹

**Earnings Quality, Sustainability, and Valuation**

To get back to brass tacks, because a fundamental analyst’s core task is to forecast future earnings and cash flows, we believe any operational definition of *earnings quality* must be useful from a forecasting standpoint. Examples of the issues earnings quality analysis can uncover include:

- very high operating margins or rapid sales growth relative to a peer group — both of which, absent solid-steel barriers to entry, typically are unsustainable in the long term;
- a steadily growing divergence between earnings and cash flows; and
- excessive capitalization of costs.

The perceived sustainability of a company’s earnings stream is arguably the most important driver of its valuation multiple. Keeping risk constant, the higher a company’s sustainable earnings growth is perceived to be by market participants, the higher its warranted multiple. Needless to say, this provides issuers with a strong incentive to influence perceptions.

**Earnings Quality and Forecasting**

Analysts and investors rarely deem the time series of a company’s aggregate earnings (that is, its own earnings history) to be sufficient in itself for accurately forecasting future earnings.² Before making these forecasts, they try to understand both the composition and the dynamics of a company’s past and present profitability (Exhibit 3).

For example, given a forecast sales number, how much typically flows through to operating profit? What is the typical rate at which operating profit translates into cash flow from operations? What is the amount of operating assets typically needed to support projected sales growth? Given a company’s capital structure and funding costs, what proportion of the top line makes it to the bottom line?

Analyzing the structure of a company’s past and present earnings allows analysts a firmer footing for their assumptions about future earnings. The weaker the earnings quality, the more difficult it is to anchor these assumptions, and vice versa.

An incorrectly interpreted low-quality earnings stream can give investors a false impression of momentum or sustainability, where instead a sharp reversion — or, worst case, a blowup — may be just around the corner. When the reversion is unexpected, it will likely have a valuation impact.

This connection between earnings quality and sustainability leads us to adopt the following working definition:

**Earnings Quality (EQ) is the extent to which:**

1. the economic drivers of a company’s profitability are likely to be sustainable (economic EQ) and
2. a company’s accounting numbers are likely to reflect the economic drivers of its profitability (accounting EQ).

This working definition of earnings quality — combining the economic and accounting dimensions — sets the stage for future work on the long-term sustainability of companies’ financial performance within or across regions and industries. To keep the analysis manageable in view of the large size of our focus area — emerging markets — we limit ourselves in the rest of this report primarily to the accounting dimension of EQ.

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² The possible exception: purely quantitative or technical investors.
Why the distinction between economic EQ and accounting EQ in our definition of earnings quality? Because we want to be clear from the outset that EQ is not only about "accounting issues." For example, a company's sales growth and operating margins could be unsustainably high from a purely microeconomic perspective, independent of any accounting overlay. Exhibit 4 illustrates this by showing the strong mean reversion of sales growth for the EM and DM constituents of the MSCI All-Country World Index (ACWI) ex-financials over the last 10 years. This pattern is driven primarily by macro- and microeconomic forces, not accounting issues.

Unfortunately, investors are rarely in a position to observe a company's business operations and "real" economic earnings directly. Instead, they have to analyze them through an accounting filter that reflects economic reality to a greater or lesser extent. As a result, it is possible for a low-quality earnings stream to look much more exciting after a makeover accounting treatment. But accounting EQ, like economic EQ, also has a sustainability property: when the accounting numbers diverge too much from the underlying economics, they tend to crash at some point.

In summary, earnings quality is a broad term with an economic dimension (Are these margins sustainable?) and a financial reporting dimension (Do these receivables adequately reflect credit risk?). Both dimensions are related to sustainability, and sustainability is a key input in valuation.

To construct the mean reversion graph, we annually rank firms into sales growth quintiles. We then plot average sales growth in the year of quintile formation and each of the 5 subsequent years, for each of the 5 quintiles. Finally, we "stack" all the plots and average the results over the different quintile formation years.
Keeping an Eye on the Accruals

Accounting earnings are simply the sum of cash flows and accruals. Revenues comprise cash receipts and the increase in accounts receivable, PP&E comprises net cash investments minus depreciation expense, etc.

Whereas cash is more or less a “hard” number, the quality of accruals depends on the overall quality of the accounting framework (GAAP) and on the choices and estimates made by the preparers of financial statements. Accounts receivable require estimates about collectibility; deferred tax assets require estimates about the capacity for future tax deductions; depreciation expense requires a choice of depreciation method as well as estimates about the useful lives of assets; etc.

Most of these choices and estimates are made in good faith and to the best of the preparers’ ability. Moreover, it is widely accepted by market participants that no accounting framework is perfect and estimates are, well, only estimates.

More troublesome are the situations in which companies, under pressure to maintain a perception of ever-growing earnings, start actively using the leeway that the accounting framework provides to make things look better than they are.

The takeaway here is that accruals and their underlying estimates, while not the only lever to influence investor perception about sustainability, are a good place to look for signs of unsustainability.4

Exhibit 6
Accruals and Earnings Quality

Example: \[ \text{SALES} = \text{CASH} + \Delta \text{RECEIVABLES} \]

General: \[ \text{EARNINGS} = \text{CASH} + \text{ACCURALS} \]

“HARDER” NUMBER

MORE ESTIMATES AND CHOICES: “SOFTER NUMBER”

Takeaways:
- Accruals involve estimates of future cash flows
- Estimates can be of high or low quality
- Low-quality accrual estimates can impact future earnings

Source: Morgan Stanley Research

EM vs. DM Earnings Quality: the 20,000-Foot View

To better understand if it is even worthwhile to contrast EM and DM earnings quality at the stock level, we first look at some aggregate patterns. We know accruals are susceptible to choices and estimation errors that can affect the sustainability of earnings growth. But is there a significant difference between EM and DM in the extent to which earnings consist of accruals?

To answer the question, we looked at the extent to which operating earnings consist of accruals in a sample of non-financial EM and DM constituents of the MSCI ACWI. Exhibit 7 on the following page shows the difference between EBIT and cash flow from operations (CFO) over the past decade — both scaled by sales for comparability. The gap can be positive or negative, so we plot its absolute value. Because the gap is due primarily to accruals, it is an indicator of the relative extent to which accounting estimates and choices have been driving results.

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4 The quality of the institutional accounting framework (GAAP) in a given jurisdiction, the quality of the audit process, the extent to which business transactions are tactically timed as well as issues of governance and outright fraud, are all factors that can have an impact on the sustainability of a company’s reported financial performance. We don’t focus on these factors in this introductory report.
The graph reveals a clear positive difference between EM and DM stocks in aggregate.\footnote{A regression test shows the difference between EM and DM to be statistically significant at the 4% level, controlling for year and industry membership. In other words, there is only a 4% probability that the observed difference is due to chance.}

**Exhibit 7**

**EM Earnings Contain More Accruals than DM Earnings**

Absolute gap between EBIT and CFO as % of sales (MSCI ACWI, annual medians)

Source: FactSet, Morgan Stanley Research

**Zooming in More Closely**

What does the EM-DM difference look like when we zoom in on working capital accruals? These are short-term accruals like accounts receivable, inventories, and accounts payable that closely track business activity. Both the generation and reversal of working capital accruals affect earnings over a short horizon, whereas the accruals in our earlier aggregate view are a mixed bag of short- and long-term accruals.

Exhibit 8 again shows a clear positive difference between EM and DM.

**Exhibit 8**

**EM Balance Sheets Contain More Working Capital Accruals than DM Balance Sheets**

Short-term working capital accruals as % of average total assets (MSCI ACWI, annual medians)

Source: FactSet, Morgan Stanley Research

Exhibit 9 and Exhibit 10 on the following page zoom in even further, on accounts receivable and inventory accruals, respectively. The overall pattern is the same: In aggregate, EM company results are significantly more driven by accruals than are DM company results.\footnote{Regression tests show that all short-term accrual differences between EM and DM are \textit{highly statistically significant} (at the 0.01% level), controlling for year and industry membership.}

**Exhibit 9**

**EM vs. DM Accounts Receivable Accruals**

Source: FactSet, Morgan Stanley Research
Isn't this just accounting? Where's the valuation impact?

Companies have long demonstrated a tendency to dismiss the impact of accounting-related incidents on their financials as "non-cash" or "purely accounting." Investors must be wary of such statements. Accruals matter.

The whole point of accruals is to record probable future cash events today. Under most commonly used valuation methods, a material future cash event is valuation-relevant. If something turns out to be wrong with the original accruals and a subsequent correction occurs, it usually means that the related future cash events were not correctly estimated in the first place. That should have a negative impact on intrinsic value.

For example, a company reports a loss because of a large negative charge to its deferred tax valuation allowance. It may dismiss that charge as a "non-cash event," which, strictly speaking, it is. However, that could be misleading. After all, the point of the charge is to account for the fact that previously expected future tax deductions (real cash) are now unlikely to materialize. The accruals matter.

Several prominent quantitative funds have long used accruals-based alpha signals when constructing their portfolios. This strengthens our belief that certain accrual patterns do, on average, affect valuations and stock prices. The quants' focus on accruals was to a large extent motivated by the extensive body of high-quality academic research in this area (see sidebar).7

Quants and Accruals

“If you’re a quant guy, you’re not digging in and very closely reading the footnotes under the general heading of earnings quality. You’re trying to extract things like proxies for aggressive accounting by using these accounting-type measures. We start with the academic evidence that’s published and then come up with proprietary tweaks that we think other people don’t know. There’s some evidence that some of these earnings quality measures do better at forecasting blowups.”

— Jacques Friedman, principal and co-head of global stock selection at AQR Capital Management

Quoted in Susan Trammell, “Illuminating the Accruals Anomaly,” CFA Magazine, January-February 2010

When Accruals Reverse

As we discussed earlier, accruals typically involve estimates about future cash flow events. For example, accounts receivable are based on estimates about the collectibility of cash corresponding to previously made sales. If all goes as planned, accounts receivable originated in a previous period disappear from the balance sheet and a corresponding amount of cash appears instead. The accruals “reverse” normally; there is no impact on earnings.

But what if the original estimates of collectibility were too optimistic? Then there is a shortfall in the cash collected, and the corresponding accounts receivable have to be written off, affecting earnings. A similar dynamic exists for inventories and PP&E.

Allen, Larson, and Sloan (2011) (ALS) trace the valuation-relevance of accruals to the fact that “extreme accruals” exhibit a high frequency of subsequent reversals with an impact on future earnings.8

In other words, if accruals are disproportionately large vs. an appropriately chosen benchmark, earnings are more likely to be “stretched.” As a result, a subsequent reversal that affects earnings is more likely.

We use ALS’s approach to illustrate this in Exhibit 11, employing the same sample of EM and DM constituents of the ACWI as before, over the same period. Every cell in the table in Exhibit 11 A corresponds to the proportion of all observations


that are in a particular quintile (row) in a given year and in the same or a different quintile (column) the next year, when the observations are ranked according to the level of accounts receivable accruals. Exhibit 11 explains the dynamics underlying the tables.

For example, 5.1% of all observations in the 2nd quintile in one year ended up in the 3rd quintile the following year. If the relative size of accruals did not matter at all, then every cell would have 4% of all observations (because observations have to add up to 100% across all quintiles). Serial correlation — a relatively high incidence of observations ending up in the same quintile the next year — would show up as percentages higher than 4 along the main diagonal. Reversal — a relatively high incidence of observations in high quintiles ending up in low quintiles the next year, or vice versa — would show up as percentages higher than 4 off the main diagonal.

Exhibits 11 A and 11 B demonstrate that while earnings growth shows strong serial correlation, accruals are more prone to reversals.\(^3\)

More important, Exhibit 11 C demonstrates the disproportionate impact on earnings of extreme accrual reversals: For example, observations in Q5 one year that drop to Q1 the following year have on average a negative 2.6% impact on earnings.

Exhibit 11
How to Read Exhibits 11A, B, and C

Exhibit 11 A
While Earnings Show Positive Serial Correlation...

<table>
<thead>
<tr>
<th>Earnings</th>
<th>Next Year's Quintiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Quintiles</td>
<td>Q1</td>
</tr>
<tr>
<td>Q1</td>
<td>13.4%</td>
</tr>
<tr>
<td>Q2</td>
<td>4.3%</td>
</tr>
<tr>
<td>Q3</td>
<td>1.3%</td>
</tr>
<tr>
<td>Q4</td>
<td>0.7%</td>
</tr>
<tr>
<td>Q5</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

Source: FactSet, Morgan Stanley Research

Exhibit 11 B
...Accruals Are More Prone to Reversals

<table>
<thead>
<tr>
<th>Accounts Receivable Accruals</th>
<th>Current Quintiles</th>
<th>Next Year's Quintiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Q1</td>
<td>Q2</td>
</tr>
<tr>
<td>Q1</td>
<td>5.0%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Q2</td>
<td>3.2%</td>
<td>5.7%</td>
</tr>
<tr>
<td>Q3</td>
<td>2.8%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Q4</td>
<td>3.7%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Q5</td>
<td>5.3%</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

Source: FactSet, Morgan Stanley Research

Exhibit 11 C
The Earnings Impact of Extreme Accrual Reversals

<table>
<thead>
<tr>
<th>Accounts Receivable Accruals</th>
<th>Current Quintiles</th>
<th>Next Year's Quintiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Q1</td>
<td>Q2</td>
</tr>
<tr>
<td>Q1</td>
<td>-1.2%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Q2</td>
<td>-0.7%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Q3</td>
<td>-1.0%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Q4</td>
<td>-1.2%</td>
<td>-0.8%</td>
</tr>
<tr>
<td>Q5</td>
<td>-2.6%</td>
<td>-0.6%</td>
</tr>
</tbody>
</table>

Source: FactSet, Morgan Stanley Research

\(^3\) Following ALS, we scale all variables by average total assets.
Developing a Composite EQ Score

Systematic earnings quality analysis is a balancing act between the needs for scalability and contextual detail:

- On the one hand, the interpretation of any company-specific EQ metric, score, or “red flag” is highly context-dependent. A company’s business model and operating environment matter greatly.
- On the other hand, it is not feasible for a portfolio manager to trawl through the financial statements of hundreds of companies to arrive at a bottom-up, comparable EQ assessment of each one. Some level of screening is required.

To address the scalability issue, we develop a composite EQ score from a number of individual signals derived from companies’ publicly available financials. Two aspects of our approach are particularly important:

1. To control to the maximum extent possible for the variety of business models across our universe of EM and DM companies, we develop the EQ signals within peer groups created at the GICS sub-industry level.
2. The individual EQ signals that form the building blocks of our composite indicator all have their roots in prior academic and applied research on earnings quality. A list of references can be found on page 22.

The Sample

Aside from data availability, nothing limits our approach to specific regions, industries, or other stock attributes. To keep the analysis both manageable and relevant for the majority of EM portfolios, however, we restricted the sample as follows:

First, we limited the EM countries to Brazil, Russia, India, China, and South Africa.

We then selected the 35 global GICS sub-industries — excluding financials — for which at least 2 EM companies were members of the MSCI ACWI at the beginning of June 2011.

Within these sub-industries we included all companies with a minimum market cap of $500m at the beginning of August 2011.

This generated a total universe of 2,223 companies (914 EM and 1,309 DM) for which we find all the data required for the analysis. Exhibit 12 shows how the sample is distributed over GICS Industry Groups. Appendix A offers a more detailed sample description.

Exhibit 12
How EM and DM Companies Are Distributed Over Industry Groups in our Sample

<table>
<thead>
<tr>
<th>GICS Industry Groups</th>
<th>EM</th>
<th>DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>293</td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>515</td>
<td></td>
</tr>
<tr>
<td>Consumer Discretion</td>
<td>309</td>
<td></td>
</tr>
<tr>
<td>Auto</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Consumer Discretion</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Information Services</td>
<td>102</td>
<td></td>
</tr>
<tr>
<td>Telecommunications</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Healthcare</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Consumer Discretion</td>
<td>178</td>
<td></td>
</tr>
<tr>
<td>Basic Materials</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Capital Goods</td>
<td>155</td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td>111</td>
<td></td>
</tr>
<tr>
<td>Telecommunications</td>
<td>86</td>
<td></td>
</tr>
<tr>
<td>Consumer Discretion</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>2,223</td>
<td></td>
</tr>
</tbody>
</table>

Source: Morgan Stanley Research

The Individual EQ Signals

Exhibit 13 on the following page provides an overview of the individual EQ signals we use to construct our composite score. Detailed descriptions and references can be found in Appendix B.

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10 Appendix C shows how the GICS sub-industries included in our sample are aggregated into their respective GICS industry groups. We point out that not all GICS sub-industries are represented in the sample, which needs to be kept in mind when looking at the industry-group-level results.

11 To avoid potential confusion: the sample we construct to develop our composite earnings quality score is different from the MSCI ACWI-derived sample from which we derived the exploratory, 20,000-foot view results earlier in the report.
### Exhibit 13

**Overview of Individual EQ Signals**

<table>
<thead>
<tr>
<th>SIGNAL</th>
<th>MNEMONIC</th>
<th>LOGIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal Short-Term Accruals</td>
<td>ASTA</td>
<td>As discussed in the body of the report, accruals involve accounting choices and estimates. When — for whatever reason — the accruals contain estimation errors, there can be an impact on earnings when they reverse. Short-term working-capital-related accruals are strongly related to sales and exhibit the strongest short-term reversal behavior. Identifying outlier accruals on an unadjusted basis would not account for the fact that working capital accruals should increase with sales. Adjusting for a “normal” or expected increase in working capital accruals as a result of increased business activity, allows us to focus only on the unexplained portion. We base this signal on work by Allen, Larson, and Sloan (2011).</td>
</tr>
<tr>
<td>Change in Receivables minus Change in Sales</td>
<td>CHARSAL</td>
<td>A significant increase in the difference between the change in receivables and the change in sales could be indicative of future difficulties converting receivables into cash. We base this signal on work by Lev and Thiagarajan (1993) and Abarbanell and Bushee (1997, 1998). Melumad and Nissim (2009) also discuss EQ signals based on the relationship between receivables and sales.</td>
</tr>
<tr>
<td>Change in Inventories minus Change in Sales</td>
<td>CHINSAL</td>
<td>Signal definition and logic almost identical to that of CHARSAL but applied to inventories, the second major component of working capital.</td>
</tr>
<tr>
<td>CAPEX vs. Depreciation</td>
<td>CAPDP</td>
<td>The asset replacement ratio can be indicative of the extent to which depreciation expense charged to the income statement reflects the annual cash cost of the company’s capacity. A persistently large value (especially above 1) suggests potential understatement of depreciation expense and corresponding overstatement of operating income. In this case, the threat to earnings comes from possible future write-offs. Also see the discussion in Melumad and Nissim (2009).</td>
</tr>
<tr>
<td>Other Assets Quality</td>
<td>OAQ</td>
<td>Beneish (1999) argues that the future benefits of non-current assets other than PPE are potentially less certain. An increase in these assets as a proportion of total assets is considered a deterioration of overall asset quality and potentially indicative of an increased propensity to capitalize and thus defer costs.</td>
</tr>
<tr>
<td>Excess Cash Margin</td>
<td>ECM</td>
<td>ECM declines when operating earnings outpace cash flow from operations. This means that earnings increasingly consist of operating accruals, consistent with weakening EQ. Furthermore, while operating earnings are measured after depreciation and amortization expense, cash flows are measured before these non-cash items. That is why, in most normal cases, ECM is expected to be greater than zero.</td>
</tr>
<tr>
<td>Effective Tax Rate</td>
<td>ETR</td>
<td>Melumad and Nissim (2009) suggest that the effective tax rate can be informative about the magnitude of transitory components in earnings. Drivers of abnormal levels of the effective tax rate are typically transitory (e.g., goodwill impairment). Extreme levels of ETR therefore tend to reverse quickly and suggest weaker EQ.</td>
</tr>
<tr>
<td>Other Items vs. Sales</td>
<td>OIS</td>
<td>Other items and unusual items constitute a residual category on the income statement that is likely more transitory in nature. Examples are impairments, unrealized investment gains (losses), legal claim expenses, etc. Outliers are more likely to indicate weaker EQ.</td>
</tr>
<tr>
<td>Operating Margin vs. Asset Turnover</td>
<td>OPMATO</td>
<td>Penman (2007) argues that the manipulation of operating expenses always influences both OPM and OpATO. All else equal, if a company decides to lower expenses (and hence capitalize more expenditures) to increase OPM, this will similarly lower ATO. In other words, constant or increasing OPM, accompanied by (relatively) decreasing ATO, could signal future decreases of OPM and therefore lower EQ.</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>SALGRO</td>
<td>To be clear, growth should be a good thing. However, following the logic of Beneish (1999), strong growth tends to put significant pressure on managers to achieve ever-higher earnings targets, for fear of stock price losses at the first indication of a slowdown. That is why it is worth looking at outlier growth, in combination with other EQ signals, as potentially indicative of “stretched” earnings.</td>
</tr>
</tbody>
</table>

Source: Morgan Stanley Research
Scoring

We don’t subscribe to the “red flag” approach based on absolute numbers used in some other reports on EM earnings quality. Who is to say that operating margins or sales growth in excess of a one-size-fits-all cutoff percentage are indicative of EQ issues? Absolute hurdles may be appropriate for the business models of some sub-industries but inappropriate for others. Context matters.

Measures of the likely sustainability of a company’s reported numbers are more appropriately developed on a relative basis and benchmarked against: 1) a universe of comparable companies (cross-sectional benchmark) and/or 2) the company’s own history (time series benchmark).

Consistent with prior empirical EQ research, our scoring method is based on the premise that while we don’t have any “absolutes” to hold on to, relative outliers are relatively less likely to be sustainable over time. When one of our individual EQ metrics identifies a company as an outlier on a cross-sectional or time-series basis, the company receives a score of 1 for that signal. If not, it receives a score of 0. A company’s composite EQ score (EQS) is simply the equal-weighted sum of its individual EQ signal scores. Exhibit 14 A shows how this works in detail for the global steel companies in our sample (GICS sub-industry code 15104050).

Exhibit 14 A

Detailed Scoring Example for the Global Steel Sub-Industry: Individual Signals and EQS

<table>
<thead>
<tr>
<th>Company</th>
<th>ASTA</th>
<th>CHARSL</th>
<th>CHNSAL</th>
<th>CAPDP</th>
<th>OAQ</th>
<th>ECM</th>
<th>ETR</th>
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</tr>
</tbody>
</table>

Source: Morgan Stanley Research

12 We chose to implement the diagnostics as binary signals to highlight the presence of extreme observations and to allow straightforward aggregation into a score. For economy of presentation we only show the scoring detail for companies with EQS greater than or equal to 3.
No Substitute for Understanding the Business

Unfortunately, there are no shortcuts. While a systematic EQ screen helps to scale the analysis, it inevitably produces false positives (Type I errors: companies wrongly identified as having weaker EQ) and false negatives (Type II errors: companies with genuinely weaker EQ slipping through the net).

This may be less of an issue for quantitatively managed portfolios, where it is only required that the screen produce the right result more often than not. But for bottom-up stock selection, the indications provided by a screen need to be followed up by a deep-dive contextual analysis of why the company scored as an outlier on individual and/or composite EQ signals.

### Exhibit 14 B
**EQ Scoring Summary for the Global Steel Sub-Industry**

<table>
<thead>
<tr>
<th></th>
<th>ASTA</th>
<th>CHARsal</th>
<th>CHINSAL</th>
<th>CAPDP</th>
<th>OAQ</th>
<th>ECM</th>
<th>ETR</th>
<th>OIS</th>
<th>OPMATO</th>
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<th>EQS</th>
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<tr>
<td>DM</td>
<td>4.4%</td>
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<td>11.4%</td>
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<tr>
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<td>12.5%</td>
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<td>16.7%</td>
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<td>25.0%</td>
<td>12.5%</td>
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<td>25.0%</td>
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<td>28.6%</td>
<td>28.6%</td>
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<td>12.5%</td>
<td>37.5%</td>
<td>62.5%</td>
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<tr>
<td>China</td>
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<td>45.7%</td>
<td>31.4%</td>
<td>10.8%</td>
<td>8.8%</td>
<td>24.3%</td>
<td>21.6%</td>
<td>13.5%</td>
<td>22.2%</td>
<td>16.2%</td>
<td>2.30</td>
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<td>South Africa</td>
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<td>33.3%</td>
<td>33.3%</td>
<td>33.3%</td>
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</tr>
<tr>
<td>Total</td>
<td>20.4%</td>
<td>24.1%</td>
<td>22.2%</td>
<td>16.7%</td>
<td>9.3%</td>
<td>18.5%</td>
<td>18.5%</td>
<td>18.5%</td>
<td>25.0%</td>
<td>21.3%</td>
<td>1.94</td>
</tr>
</tbody>
</table>

Source: Morgan Stanley Research

### Exhibit 14 C
**EM vs. DM Distribution of EQS: Global Steel**

![EM vs. DM Distribution of EQS: Global Steel](chart)

Source: Morgan Stanley Research
Results

Earnings Quality: Emerging vs. Developed Markets

In Exhibit 15 we plot the proportion of EM and DM companies in our sample achieving a particular composite EQ score (EQS) in the most recent reporting year (a higher EQS means weaker EQ). A company with an EQS of 1 is in the top quartile of its global sub-industry peer group for only 1 of the individual EQ signals we consider; a company with an EQS of 2 is in the top quartile for 2 signals; and so forth. A higher EQS indicates weaker EQ, because the company is a relative outlier in a higher number of individual EQ signals. 

As can be seen in the exhibit, 23% of EM companies vs. 32% of DM companies have an EQS of 1 (stronger EQ). On the other hand, 16% of EM companies vs. only 7% of DM companies have an EQS of 4 (weaker EQ).

Exhibit 16 shows the summary statistics for the most recent year. The average DM EQS is 2.2, while the average EM EQS is 1.5. A regression test that controls for the sub-industry membership of the sample companies is highly significant (at the 0.01% level). In other words, it is highly unlikely that mere chance explains the observed difference in EQ between EM and DM.

13 To be precise, for most of the EQ signals we consider, a company that scores “1” will not only be in the top quartile relative to its global sub-industry peers but also be an outlier with respect to its own history. Appendix B has more details on how the individual EQ signals are derived from company fundamental data.
Does Size Matter?

In the 2010 data, the EQS exhibits a moderate size-effect for DM companies (larger firms obtain smaller scores), but not for EM companies. The pattern for large DM firms is not surprising, but the finding for EM is both surprising and relevant. Because larger EM companies score no differently than smaller ones, investors need to focus on EQ regardless of size.

Exhibit 18
EQS and Size
Median market cap (US$ m) across EQS

Exhibit 19 provides another view of the relationship between size and EQ by focusing only on the MSCI ACWI members in our sample – 671 in total, or 170 EM and 501 DM names. Of these, 19% of the EM companies scored higher than 3 vs. only 6% of the DM companies.

Exhibit 19
Distribution of EQS Across EM and DM Companies: ACWI Constituents Only

Industry Groups

We next look at EM-DM differences in EQ at the GICS industry group level. Consistent with our overall EM vs. DM findings, Exhibit 20 shows that average EQS aggregated over GICS industry groups are typically larger in EM than in DM, with the exception of Telecommunication Services. Food & Staples Retailing shows the most extreme difference between EM and DM, with average EQS of 3.3 and 1.6, respectively (significantly different at the 0.01% level).

Exhibit 20
Average EQS Across Industry Groups

Exhibit 21 on the following page highlights the contrast between EM and DM by focusing only on the high scores (EQS greater than 3). With the exception of Telco Services, DM frequencies are uniformly below the corresponding EM frequencies.

14 Appendix C shows how the sub-industries in our sample are aggregated into their respective industry groups.
Exhibit 21
EM vs. DM Frequencies of EQS > 3 Across Industry Groups

Exhibit 22 and Exhibit 23 zoom in on Food & Staples Retailing and Telco Services, which occupy the extremes in both average EQS and frequency of high EQS. The EM and DM distributions reveal a predominance of high scores for EM Food & Staples Retailing, whereas in Telco Services there is both a stronger similarity between EM and DM and a predominance of low scores for EM.

Exhibit 22
Food & Staples Retailing

Exhibit 23
Telco Services

EM Countries

Of all the countries represented in our sample — EM and DM combined — India and China had the highest average EQS, while South Africa recorded the lowest average EQS.

The average EQS differences between DM and the BRIC countries are statistically significant at the 5% level. South Africa, however, is indistinguishable from DM as a whole in terms of EQS. In other words, the country-specific results are consistent with South Africa being similar to the DM countries on average.

Exhibit 24
BRICS vs. DM EQS

Average and median EQS based on most recent observations
Focusing on EQS above 3 brings into greater relief the contrast between Brazil, India, and China vs. South Africa and DM.

Exhibit 25
BRICS vs. DM EQS: Focus on High Scores
Frequencies of EQS > 3 based on most recent observations

![Bar chart showing EQS frequencies for BRICS vs. DM countries based on most recent observations.]

Source: FactSet, Morgan Stanley Research

Which Industry Groups in Which Countries?

To conclude, we bring our analysis to the level of industry groups in specific EM countries. Exhibit 26 shows the 15 highest average EQS (using the most recent observations) in country-specific industry groups. Strikingly, none of the 15 country-industry group pairs are from DM. By contrast, consistent with the earlier country-only results, 9 of the 15 industry groups are from China, 3 from India, and 2 from Brazil.

Exhibit 26
Country-Industry Pairs with Highest Average EQS
Based on most recent observations

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>Average EQS</th>
</tr>
</thead>
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<td>2.6</td>
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<tr>
<td>CN AUTO</td>
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<td>CN TRANS</td>
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<td>CN ENER</td>
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<td>CN RETAIL</td>
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<tr>
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<td>2.2</td>
</tr>
<tr>
<td>RU MATE</td>
<td>2.0</td>
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</table>

Source: FactSet, Morgan Stanley Research

Exhibit 27 complements the overall ranking of country-industry group pairs by focusing on the frequencies of stocks with EQS > 3 while limiting the number of industry groups per country to a maximum of 3.

The industry groups in DM with the highest frequency of high-EQS stocks are Pharmaceuticals, Biotech & Life Sciences; Telco Services; and Utilities. These three have high-EQS frequencies of around 10%, which is low compared to the corresponding top high-EQS industry groups in China, India, and Brazil, where the frequency of high-scoring firms surpasses 20%.

Exhibit 27
Industry Groups with Highest Frequencies of EQS > 3 Across EM and DM
Maximum 3 industry groups per DM/Country – most recent firm observations

<table>
<thead>
<tr>
<th>Industry Group</th>
<th>Frequency</th>
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<tr>
<td>DM PHARM</td>
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<tr>
<td>DM TELEC</td>
<td>11%</td>
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<tr>
<td>DM UTIL</td>
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<td>CN CONSDUR</td>
<td>30%</td>
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<td>CN PHARM</td>
<td>28%</td>
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<td>CN RETAIL</td>
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<td>IN SOFTW</td>
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<tr>
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<td>5%</td>
</tr>
<tr>
<td>SA MATE</td>
<td>5%</td>
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</table>

Source: FactSet, Morgan Stanley Research

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We include only country-industry group pairs with at least 10 firm-observations for this analysis.
Appendix A: Sample

Sample Construction

We constructed a BRICS/DM sample from the bottom up by selecting 35 global GICS sub-industries for which we found at least 2 BRICS companies that were part of the MSCI All-Country World Index at the beginning of June 2011. Within each of these sub-industries we selected all firms that had a market value of $500m at the beginning of August. After imposing data criteria needed to compute our diagnostics (we need a minimum of 3 observations for each EQ signal variable), we obtained a universe of analysis comprising 2,223 companies, or 1,309 DM companies and 941 BRICS companies (81 in Brazil, 86 in Russia, 124 in India, 567 in China, and 56 in South Africa).

Sample Statistics

Exhibit 28 shows how the EM and DM companies are distributed across the industry groups in our sample. Overall, the sample is split 41% EM and 59% DM. There is significant variation across the industry groups, with the majority of the aggregated industry groups containing more DM than BRICS firms. The exceptions are Materials; Automobiles & Components; Pharmaceuticals, Biotechnology & Life Sciences; and Utilities.

Exhibit 29 shows a large variation in market cap across DM and the 5 BRICS countries in the sample. India and China appear to have the smallest companies; however, all country samples include mega-cap names, which we exclude from the exhibit to avoid distorting the picture.

Finally, Exhibit 30 shows the rate of attrition in our sample. As we discuss above, we built the sample from the bottom up, starting with the current set of sub-industries that satisfy our MSCI AC World Index criterion. To calculate our diagnostics, we needed historical information for each of the sample constituents to assess the firm-specific part of the diagnostics (we require a minimum of 3 years of data for the diagnostics components for each calculation). The exhibit shows the rate of attrition as we go back in time to calculate the diagnostics and the scores.

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Note: Even though we constructed the sample at the GICS sub-industry level, for reasons of parsimony we aggregate companies in a smaller number of GICS industry groups to present sample statistics. Appendix C shows how we aggregate.
Exhibit 30
Number of Annual Sample Observations: Attrition

Source: FactSet, Morgan Stanley Research
Appendix B: The Individual EQ Signals

The individual signals used in our analysis were motivated by the academic and professional literature on earnings quality. These signals do not necessarily represent the optimal set of metrics for distinguishing weaker from stronger EQ. Statistical techniques such as factor analysis and back-testing may more aptly extract an optimal combination of signals, but such approaches also have costs in terms of implementation.17

1. Abnormal Short-Term Accruals (ASTA)

**Signal:** Following Allen, Larson, and Sloan (2011), we define short-term accruals as the change in non-cash current assets minus the change in current operating liabilities (excluding taxes payable). We define normal short-term accruals as one-year-lagged working capital times annual sales growth. We then measure abnormal short-term accruals (ASTA) as realized current short-term accruals minus normal short-term accruals. We scale the result by average total assets. The signal value is 1 if ASTA is both greater than Q3 of the annual cross-sectional distribution and greater than the median of the firm-specific time-series distribution over the last 10 years; otherwise, the signal value is 0.

**Logic:** As we discuss in the body of the report, accruals involve accounting choices and estimates. When, for whatever reason, the accruals contain estimation errors, there can be an effect on earnings when the errors reverse. Short-term working capital–related accruals are strongly tied to sales and exhibit the strongest short-term reversal behavior. Identifying outlier accruals on an unadjusted basis would not account for the fact that working capital accruals should increase with sales. We adjust for a “normal,” or expected, increase in working capital accruals as a result of increased business activity; this allows us to focus on the unexplained portion.

2. Change in Receivables vs. Change in Sales (CHARSAL)

**Signal:** Following Lev and Thiagarajan (1993), we define CHARSAL as the difference between percentage change in accounts receivable and percentage change in sales. To capture a 3-year view on the diagnostics of interest, we define both percentage change variables relative to the average of the past two years accounts receivable. We measure only trade accounts receivable in the definition of this diagnostic and exclude other receivables. The signal value is 1 if CHARsal is both greater than Q3 of the annual cross-sectional distribution and greater than the median of the firm-specific time-series distribution over the last 10 years; otherwise, the signal value is 0.

**Logic:** A significant increase in the difference between the change in receivables and the change in sales could indicate future difficulties converting receivables into cash. We base this signal on work by Lev and Thiagarajan (1993) and Abarbanell and Bushee (1997, 1998). Melumad and Nissim (2009) also discuss EQ signals based on the relationship between receivables and sales.

3. Change in Inventories vs. Change in Sales (CHINSAL)

**Signal** definition and **logic** almost identical to that of CHARSAL but applied to inventories, the second major component of working capital.

4. CAPEX vs. Depreciation (aka Asset Replacement Ratio) (CAPDP)

**Signal:** We define CAPDP as the ratio between capital expenditures (from the statement of cash flows) and depreciation and amortization expenses (from the income statement). The signal value is 1 if CAPDP is both greater than Q3 of the cross-sectional distribution over the last 10 years and greater than the median of the firm-specific time-series distribution over the last 10 years; otherwise, the signal value is 0.

**Logic:** The asset replacement ratio can indicate the extent to which depreciation expense charged to the income statement reflects the annual cash cost of a company’s capacity. A persistently large value (especially above 1) suggests potential understatement of depreciation expense and corresponding overstatement of operating income. In this case, the threat to earnings comes from possible future write-offs. Also see the discussion in Melumad and Nissim (2009).

---

5. Other Assets Quality (OAQ)

**Signal:** We define *other assets* as the sum of intangible assets and non-PP&E, non-financial long-term assets. OAQ is other assets as a proportion of total assets. The signal value is 1 if OAQ is both greater than Q3 of the annual cross-sectional distribution and the change in OAQ is greater than the median of the firm-specific time-series distribution over the last 10 years; otherwise, the signal value is 0.

**Logic:** Beneish (1999) argues that the future benefits of non-current assets other than PPE are potentially less certain. An increase in these assets as a proportion of total assets is considered a deterioration of overall asset quality and potentially indicative of an increased propensity to capitalize and thus defer costs.

6. Excess Cash Margin (ECM)

**Signal:** Following Mulford and Comiskey (2005), we define ECM as the difference between cash flow from operations and operating earnings as a percentage of sales. The signal value is 1 if ECM is both less than Q1 of the firm-specific time-series distribution over the last 10 years and less than zero; otherwise, the signal value is 0.

**Logic:** ECM declines when operating earnings outpace cash flow from operations. This means that earnings increasingly consist of operating accruals, consistent with weakening EQ. Furthermore, while operating earnings are measured after depreciation and amortization expense, cash flows are measured before these non-cash items. That is why, in most normal cases, ECM is expected to be greater than zero.

7. Effective Tax Rate (ETR)

**Signal:** We define ETR as income tax expense scaled by pretax income. The signal value is 1 if ETR is less than Q1 of the firm-specific time series distribution over the last 10 years; otherwise, the signal value is 0.

**Logic:** Melumad and Nissim (2009) suggest that the effective tax rate can be informative about the magnitude of transitory components in earnings. Drivers of outlier effective tax rates are typically transitory (e.g., goodwill impairment). As a result, extreme levels of ETR tend to reverse quickly and suggest weaker EQ.

8. Other Items vs. Sales (OIS)

**Signal:** We define *other items* as the sum of unusual items and other non-operating income (as defined by FactSet Fundamentals). OIS is other items scaled by sales. The signal value is 1 if OIS is both greater than Q3 of the annual cross-sectional distribution and greater than the median of the firm-specific time-series distribution over the last 10 years; otherwise, the signal value is 0.

**Logic:** Other items and unusual items constitute a residual category on the income statement that is likely more transitory in nature. Examples are impairments, unrealized investment gains (losses), legal claim expenses, etc. Outliers are more likely to indicate weaker EQ.

9. Operating Margin vs. Asset Turnover (OPMATO)

**Signal:** We define OPMATO as the difference between the percentage change in operating profit margin (OPM) and the percentage change in operating asset turnover (OpATO). Similar to signals 2 and 3, we define both percentage change variables relative to the average of the past two years. The signal value is 1 if OPMATO is both greater than Q3 of the annual cross-sectional distribution and greater than the median of the firm-specific time-series distribution over the last 10 years and the change in OPM is greater than or equal to zero; otherwise, the signal value is 0.

**Logic:** Penman (2007) argues that the manipulation of operating expenses always influences both OPM and OpATO. All else equal, if a company decides to lower expenses (and hence capitalize more expenditures) to increase OPM, this will similarly lower ATO. In other words, constant or increasing OPM, accompanied by (relatively) decreasing ATO, could signal future decreases of OPM, and therefore lower EQ.

10. Sales Growth (SALGRO)

**Signal:** The signal value is 1 if annual sales growth is both greater than Q3 of the annual cross-sectional distribution and greater than the median of the firm-specific time-series distribution over the last 10 years; otherwise, the signal value is 0.

**Logic:** To be clear, growth should be a good thing. However, following the logic of Beneish (1999), strong growth tends to put significant pressure on managers to achieve ever-higher earnings targets, for fear of stock price losses at the first indication of a slowdown. That is why it is worth looking at outlier growth, in combination with other EQ signals, as potentially indicative of “stretched” earnings.
Cited References


### Appendix C

**Mapping of Sample Sub-Industries onto Industry Groups.**

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September 28, 2011

Strategy

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In December 2007, Morgan Stanley, a New York based investment bank, published a report explaining its new “risk-reward framework”, a research approach that would underlie all of its future equity analysis. The risk-reward framework went beyond existing practice by supplementing the traditional ratings (e.g., “buy”, “hold”, “sell”) that analysts typically made on the basis of a price that they expected a stock to reach in 12 months’ time. Single point price targets derived from fundamental analysis of a company’s intrinsic value and its projected future cash flows. The risk-reward framework did not dispense with such modeling, but required analysts to expand their explanation of a company’s prospects by incorporating both bull and bear case scenarios in addition to the analyst’s base case expectations for the company’s stock price over the following 12 months. To generate these three scenarios, Morgan Stanley required analysts to specify the key drivers of company performance over this period and to indicate how these drivers could be expected to yield the price targets associated with the bull, bear, and base cases. (See Exhibit 1 for examples from reports using the risk-reward framework.)

By integrating the concept of risk into fundamental analysis, the risk-reward framework aimed to supplant what Morgan Stanley called the “false precision” of single point price targets with a more realistic set of potential outcomes while also inviting deeper and richer discussions between buy-side clients and Morgan Stanley equity analysts and salespeople. By summer 2010, the risk-reward framework was standard practice for Morgan Stanley’s equity analysts, and the research department was extending the framework to additional products and forecasts, including fixed income products, equity derivatives, and even GDP estimates. Noted managing director Barry Hurewitz, COO for global research:

Not only does this framework offer a recommendation, a target price, and a point of view—the base case—it gives a view on the unknowns: If everything goes wrong, how far is the downside? How much upside is there? That’s a far richer and more valuable basis for client dialog, and this business is all about the dialog, not the target price. Clients don’t just want ideas. They want to understand the thought process behind the ideas and they want the evidence that supports the idea.
Equity Research at Morgan Stanley

As at other major investment banks, equity research at Morgan Stanley aimed to interest clients in particular investment and trading opportunities as a way of generating trading commissions, which investors paid on the basis not only of the quality of analyst ideas and trading calls, but the efficiency of the trading room’s execution and such services as capital commitments and access to managers at firms in which the buy-side might invest. Most institutional investors calculated their allocation of trading commission payments among brokerages based on the results of regular surveys of their own analysts, portfolio managers, and traders. These surveys scored the quality of service from each brokerage and its individual employees. Brokerage houses and their research departments therefore had a strong incentive to maximize these “broker votes” by providing institutional investors with valuable and differentiated insights.

Structural factors increased this pressure. A particular industry sector might be covered by 30 or 50 highly competitive sell-side analysts, only three or four of whom would be top-ranked. However, any given client followed just two to five analysts for a particular stock or sector, and industry rankings showed that the leading analysts held disproportionate market share. The top three analysts held the bulk of the buy-side’s attention, which translated to perhaps 80% of commissions for those stocks available from that investor. Some analysts therefore made bold recommendations to stand out from the pack.

Headed in 2010 by Juan-Luis Perez, Morgan Stanley’s 279 research analysts covered 2,700 stocks and were managed on a regional basis—for Asia-Pacific, Europe, Japan, Latin America, and North America—by directors and associate directors of research. Analysts built models of individual companies’ anticipated performance, and using a variety of valuation techniques tried to predict a price at which the company’s shares could be expected to settle 12 months hence. Each morning, the bank’s sales and distribution team convened to hear the best new analyst ideas before a day of sales calls and conversations with buy-side institutional clients. At Morgan Stanley, a typical morning call might include 400 institutional salespeople who covered 125,000 contacts across 7,000 accounts.

Supporting and overseeing the quality of analyst research in each region were three key groups: a stock selection committee, which challenged analysts to justify and support their arguments; an editorial function, which worked with analysts to promote clear thinking and writing in addition to regulatory compliance around report language and forward-looking statements; and global valuation and accounting professionals, who worked to strengthen analyst modeling and to make Morgan Stanley research accurate and globally consistent using its ModelWare database. Additional research support came from operations such as AlphaWise, an in-house team of primary researchers who gathered evidence on analyst hypotheses from multiple sources, including surveys and digital data mining. (Exhibit 2 shows a simplified organization chart.)

Morgan Stanley’s research department published tens of thousands of reports each year, and many of its clients received over 1,000 communications each day. As a result, noted Vlad Jenkins, global product strategist, “You cannot monetize the printed product. You have investors’ attention for a few split seconds as they decide whether to erase the report or not. The report has to signal to our clients that the analyst may have ideas valuable enough to justify a conversation between them.” Analyst reports were published on the Morgan Stanley website and the text was transmitted to vendors such as Bloomberg and Thomson Reuters where it appeared as headlines hot-linked to the report text. Clients also set up alerts to be emailed about reports of interest.
Foundations of the Risk-Reward Framework

Following the collapse of the internet and technology stock bubble in 2000 and the market uncertainty created by the terrorist attacks on the United States in September 2001, Morgan Stanley managers were working in 2002 to clarify the role, importance, and effectiveness of the firm’s research arm. As New York Attorney General Eliot Spitzer jostled with major investment banks in April 2002 over the extent to which equity analysts failed to act independent of the interests of the firms’ investment banking arms, Morgan Stanley’s then-head of institutional securities, Vikram Pandit, convened a team to assess the effectiveness of the action ratings that Morgan Stanley analysts included in their reports. Although Morgan Stanley surveys showed that its clients did not want to see the practice of rating stocks end, Trevor Harris, who then headed global valuation and accounting, was asked to develop a compelling alternative. The objective was to create a differentiated research offering so compelling that none of the buy-side firms then consolidating their research purchasing would be able to justify omitting Morgan Stanley from its core three or four research providers.

Harris proposed that analysts add to their reports upside and downside scenarios in addition to the expected target price, noting that the analysts already often did such work in the course of their modeling. In addition, Harris argued that making these scenarios explicit would benefit clients, whose investment horizons and objectives varied much more than publication of a single price target or rating could address. Noted Harris, “A buy recommendation for one investor might be a sell for someone else. If I am long airline stocks, I might be doing something completely different with oil stocks than I would if I was investing in a refining business. The idea of the risk-reward framework is to facilitate much more representation of a company’s story by permitting the sales force to frame that story in a way that is relevant to particular investors.”

The salesforce and their clients alike preferred certainty, simplicity, and assurance. The risk to both Morgan Stanley and its clients lay in any false sense of certainty created by analysts on the basis of the pressure they felt to be seen as industry and company experts and to make correct calls on specific stocks. Research analysts were also prey to behavioral biases that affected everyone. These ranged from overconfidence in one’s expertise and reluctance to re-evaluate one’s existing views in light of new disconfirming evidence, to a tendency to allow risk-aversion to cloud the opportunity for gains, or to underestimate the likelihood of extreme events. Such “tail risk” was particularly common in the aftermath of the financial crisis of 2008, and was of concern to Kenneth deRegt, Morgan Stanley’s chief risk officer:

The Morgan Stanley Research Risk-Reward model is very consistent with the way we model and manage risk for the firm. It’s those scenarios or those market outcomes that produce very extreme events that we try to be sensitive to and where we might try to eliminate some of the tail risks. I started my career as a trader, so I actually smiled when I saw the early versions of the Risk-Reward framework because it puts much more academic rigor around what a lot of traders have done intuitively over the years. They’re looking at a set of outcomes and they’re trying to make a judgment about how the price reflects the probability of a set of outcomes. Just as the research analyst is looking at a range of fundamental factors, as a trader I would look at a set of factors, I would try to rank order them, I would try to find out what’s in the price.

Additional structural factors compounded the challenge. Individual buy-side analysts covered seven to eight times the number of stocks covered by the average sell-side analyst. Thus, the buy-side did indeed look to sell-side analysts for expertise on both industries and companies. The buy-side also looked to the sell-side for information about the investment debates that individual companies faced, and for clues to the behavior of other buy-side firms. Noted Hurewitz, “Even if you are at a big
firm like Fidelity or Wellington, you need to talk to someone who is talking to the other market participants. That gives you a sense of what people think the outcomes are going to be, and that’s of real value to the buy-side.”

However, a single point price estimate gave salespeople and analysts little leverage with which to develop their relationships with buy-side clients: clients might listen to the pitch for the stock but had little interest in a conversation primarily about price expectations, whereas the scenarios that Harris proposed to make explicit in the risk-reward framework gave more basis for dialog, an “invitation to multiple conversations.” Linda Riefler, head of equity and fixed income research, pointed out that, “We are in the conversations business. At Morgan Stanley, we are meant to understand value and risk to value and to have conversations that give people timely and relevant insights which help them accomplish their goals. It’s critical for the entire firm to know how to quickly use research focusing on both securities and companies in their conversations, both with buy-side clients and internally.”

The Risk-Reward Framework

As defined by Morgan Stanley in its December 2007 report, the risk-reward framework unlocked the full potential of fundamental analysis by uncovering for investors the potential alpha in a given stock over 12 months, coupled with a forward-looking measure of risk, the better to suit the needs of active portfolio managers, who were commonly evaluated on their risk-weighted returns. In contrast, Morgan Stanley argued that the existing approaches to equities research—”single-point estimates and one-dimensional investment theses”—reflected “an outdated view of the world, part of a misguided attempt to project an analyst’s firm conviction and solid expertise.” Not only did a single-point estimate “convey a false sense of certainty and accuracy…but more importantly, it [did] not enable the investor to understand how the analyst became comfortable with the risk-reward tradeoff of the investment.”

The report faulted quantitative frameworks that attempted to assess equity risk for two key limitations: they required “some restrictive assumptions made for mathematical convenience or computational simplicity; …more important, in most cases quantitative risk forecasts are essentially more or less sophisticated extrapolations of the past.” The risk-reward framework, in contrast, incorporated “directly forward-looking, nuts-and-bolts information on the alternative paths that a company’s value drivers might follow in the near to medium-term.” This probabilistic view of equity values was a core feature of the framework, in which analysis began “by pinpointing the ‘critical uncertainties’—a small set of carefully selected key value drivers that can have a high impact on value and a wide range of plausible outcomes.” Analysts could “summarize any risk factor, including fundamental value drivers, by the probability distribution of its possible future values, and…summarize risk by the standard deviation of that distribution.”

The risk-reward view of a stock, therefore, included “the analyst’s choice of critical uncertainties, the assumptions underpinning various scenarios, and an implicit or explicit assessment of the relative likelihoods of different outcomes” (see Exhibit 3). The report again distinguished Morgan Stanley’s framework from a quantitative approach that “would calculate a confidence interval within which the stock price is expected to fall with a given likelihood” given a measure of historical volatility and expected return. A fundamentals-driven risk-reward approach could not produce a continuous probability distribution. Instead, the report warned, “we believe attempts to force fundamental analysis of risk into this direction would yield spurious precision,” since “the real-world business scenarios that inspire investor debate—the success of a restructuring effort, or achieving critical market share in a recently launched product line—do not correspond to textbook confidence intervals or standard probabilities.”
Instead, the risk-reward view asked analysts to extract as much risk information as possible from their fundamental analysis in order to generate three scenarios that marked the “band of uncertainty” around a particular stock (see Exhibit 4). Each price scenario: (1) identified a company’s key business drivers; (2) identified the metrics affecting those drivers; and (3) predicted the impact of likely changes in those metrics on target company performance and share price. The analyst’s base case corresponded to what the analyst would provide in the absence of any risk-reward analysis, and was often the source of an analyst’s price target, which Morgan Stanley continued to include in its reports and to distribute to third-party aggregators of consensus estimates such as First Call. In addition, the analyst generated bull and bear cases that articulated the likely effects on a company’s stock price of positive and negative changes in the firm’s key value drivers. The scenarios needed to be coherent, relevant to current investment debates, and representative of a full range of plausible outcomes. They also needed to clearly reflect the analyst’s view of any bias, or skew, in the odds of making or losing money. Morgan Stanley asserted that the firm imposed clear rules related to setting price targets and expressing views on the relative likelihoods of alternative scenarios to ensure price targets logically consistent with the scenarios.

A key benefit of this approach for the investor, the report asserted, was that in “moving from single-point estimates of value or price to a fundamental view on the risk-reward tradeoff of any investment, Morgan Stanley’s analysts are also providing a transparent level of conviction.” The transparency lay in the direct linkage between the price targets generated by the scenarios and variation in the behavior of the specific drivers underlying them. Thus, a higher conviction call would be supported either by a narrower range of variation between a bull and bear scenario, or by a more favorable upward or downward skew relative to the base case price target (see Exhibit 5). The link to performance lay in Morgan Stanley’s claim that “an investment decision process that consistently focuses on the most favorable risk-reward tradeoffs has to produce superior [portfolio returns] in the medium- to long-term.”

As a sell-side tool, analyst reports that applied the risk-reward framework had other benefits as well. Most obviously, an explicit statement of key drivers of company and share performance had the effect of opening up to investors the elements that formed the basis of an analyst’s views. As Harris commented, “It’s really about being much more explicit, about actually identifying what is happening on the pricing side of the analysis, and about creating the means by which to tell a story that is relevant to the varying needs of different investors.” An explicit story was of value not only to the investor, but to Morgan Stanley’s salesforce, he continued: “This is all you need at the morning sales meeting. The key question for the analyst is, ‘What’s your story today? Is it a pricing call? A fundamentals call?’ With this knowledge, a salesperson can frame the sales story that you are trying to get into the marketplace. You don’t need a rating, you need to tell an investable story for different investor types.”

Making risk explicit was another important benefit of the framework, noted Global Head of Valuation and Accounting Guy Weyns: “Part of the exercise was to bring modern notions of risk long familiar to banks and investors into the model at the analysts’ level and make it a differentiator in the marketplace for Morgan Stanley. The framework makes uncertainty more transparent, which makes the research more credible.” Added Perez, “The value we can add lies in helping recognize potential outcomes related to uncertainties in the underlying businesses and using scenarios to better manage price-related risks.”

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*a The report distinguished scenarios from sensitivity analysis, which was defined simply as “varying some value drivers independently without regard for the interdependence inherent in the underlying business context.” See Guy Weyns, Juan-Luis Perez, and Vlad Jenkins, “Risk-Reward Views: Unlocking the Full Potential of Fundamental Analysis,” Morgan Stanley Global Research, December 17, 2007, p. 6.*
Explicit scenario analysis also brought the research department benefits, both by standardizing research, thereby making global research output more consistent, and by forcing analysts to think more carefully and to critique their analysis more deeply with the goal of minimizing the impact of behavioral bias. To generate the bear case scenario, for example, analysts had to consider what could go wrong with their base case investment thesis—Where was the evidence weakest? What unknowns remained? It allowed the stock selection committee to ask tough questions of bullish analysts. Articulating the bear case forced analysts to look at the downside scenario—a valuable exercise given the natural tendency among analysts to highlight the positive aspects of the stock. Flipping the process around generated the bull case: Where was the analysis overly pessimistic? What sources of potential upside surprises existed?

Implementing the Framework

The risk-reward approach was first implemented in Europe in 2003 under Perez, then the head of research there. Perez introduced the framework by proposing it as a tool to help analysts who were not performing up to expectation. Weyns became the face of the project, working with individual analysts to introduce scenario analysis to their reporting by teaching them how to use the valuation approach. Recalled Perez: “We, particularly Guy, started by helping the teams that were most in need of help. We decided to help the underperformers, those who were struggling to quantify uncertainty. They had calls that hadn’t been working, had experienced major pushback from the salesforce against their recommendations, didn’t know what they were doing with the stocks, or worried about being unjustifiably out of consensus in their views.”

When some of the more successful European analysts got wind of initial successes among the analysts Weyns had targeted, they applied the framework to their own work. The credibility that came with this endorsement created a basis for its broader application. This was an important development, one manager explained, because star analysts could just as easily ignore new frameworks that did not suit their approach or their own client constituency; leading analysts had a lot of job options, and imposing change on them was rarely painless.

The framework’s widespread acceptance in Europe, and Perez’s elevation to global research director in 2006, set the stage for the introduction of the framework on a worldwide basis. For global implementation, Perez relied upon three institutional levers within the research department: global accounting and valuation, the editorial function, and the stock selection committee.

Global Valuation and Accounting

Complex topics such as accounting for pensions and stock options, and more generally international differences in corporate operating and financial performance metrics, presented unique valuation challenges that Morgan Stanley’s Global Valuation and Accounting team helped investors, corporate clients, research analysts, and other internal stakeholders tackle.

One way the team institutionalized this expertise was through ModelWare, a global database that assured the consistency of analyst models and metric definitions. Analyst reports could be uploaded into Morgan Stanley’s publishing system only when their data met ModelWare standards. As such, ModelWare effectively served as a quality control mechanism for the price and economic models in analyst reports, as no report could be published if it was not first uploaded.

Experience in working with analysts around the world on modeling and valuation issues, as well as the global implementation of ModelWare, situated the team well to help introduce the risk-reward framework.
Editorial

Wall Street firms employed editors to ensure that their analysts’ reports were clearly written and complied with regulatory requirements regarding inflammatory and exaggerated language and claims. At Morgan Stanley the research department’s 40 editors and supervisory analysts vetted and proactively shaped analyst output. Early on, Jenkins recalled, “We offered analysts the risk-reward framework as a clarifying expository tool. Once half or more of the analysts were using the template, management required it of all of them.” In each of the regional headquarters (London, New York, Hong Kong, and Tokyo), seven or eight editors worked with analyst research teams to apply the risk-reward framework consistently and clearly, restructuring reports as necessary. Research management and editors could block reports that did not comply. Analysts valued the editorial support and in many cases they approached editors before writing to ask for help shaping the structure of their presentation. As a result, Morgan Stanley editors ended up helping frame investment debates and scenarios for the stock, consulting about content rather than just assuring regulatory compliance. They also applied a standard global template to analyst reports.

Stock Selection Committee

Wall Street’s 2003 settlement with New York State Attorney General Eliot Spitzer included the requirement that sell-side firms use stock selection committees to assure and control research quality. Stock selection committees existed prior to the 2003 Global Analyst Research Settlement, but the settlement gave them a regulatory function as well. At Morgan Stanley, Perez strengthened the rigor of the committee’s deliberations, defined standards for all reports to meet, and made the committee in each region a tool to assure the consistency of analyst arguments and the application of the risk-reward framework. As he emphasized, “Every research report has three elements, the text, the numbers, and the recommendation. They should be consistent but often they are not. Sometimes you read research reports in which the text and numbers don’t match the recommendation, or in which the numbers don’t match the text and recommendation. The key word we are looking for is consistency.” Perez appointed some of his best analysts to run the regional committee. This proved to be an important decision, as their credibility contributed to faster acceptance of the risk-reward framework by the other Morgan Stanley analysts.

Given the large volume of research produced at Morgan Stanley, the stock selection committee met daily. In addition to a member of research management, the committee’s permanent members included very senior analysts for whom the committee was their primary or sole responsibility, supplemented by floating members—strategists or additional analysts from the same or related industries—depending on the issue, recommendation, and industry. The object at Morgan Stanley was also to evaluate whether the analyst’s range of outcomes was appropriate, to understand the consistency of the analyst’s arguments, and to ensure they were explained in a way that clients could understand (see Exhibit 6).

The stock selection committee met to discuss individual reports upon every initiation or resumption of coverage, upon every change in recommendation, and upon every material change in analyst price targets and estimates. To force analysts to think through the implications of their arguments, the committee asked analysts what could go wrong with the scenarios they had generated, typically challenging the most optimistic and pessimistic scenarios, “like a dentist probing for cavities,” as one manager put it. The committee often sent reports back for revision, which led to analyst grumbling but ultimately resulted in a stronger product. Another tool that strengthened analyst reports was the semi-annual product quality score that the stock selection committee assigned each analyst. Included in each analyst’s annual performance evaluation, the scores assessed the rigor
of their risk-reward analysis and the relevance of the price drivers and investment debates that they identified.

An area on which research department management increasingly focused was on trying to understand how the market viewed a security’s actual price, quite apart from fundamental analysis that sought an intrinsic value for the company, from which an “objective” price per share would follow. Explained Perez, “Analysts tend to be better at understanding the direction that a company is moving rather than understanding what investors will be willing to pay for that. To understand what’s in the price, we have two approaches. One is what everyone else does, to understand the terminal growth rate embedded in the security [see Exhibit 7 for ‘What’s in the Price’]. The other thing is to compare the distribution of outcomes we generate for some of the stocks we cover through the risk-reward framework with the distribution of outcomes that is implied by the options market.”

Committee members sometimes asked analysts to justify their valuations with reference to options-implied values as a check on the analyst’s arguments and as a way to quantify the degree to which an analyst’s estimates were aligned with or out of market consensus. For instance, an analyst might be able to spot a base case scenario for which the market would assign a relatively low probability of, say, 30%, or a bull-case scenario where the options market would assign only a single-digit percentage probability. (See Exhibit 8 for an illustration of how the analysts’ scenarios compared to the market’s view of those scenarios and option implied probabilities).

**Assessment**

For the risk-reward approach to succeed, Morgan Stanley had to overcome obstacles posed by industry structure, described above, traditional practice, and behavioral biases. The salesforce both pulled and pushed its institutional equity investor clients. The pull came in assessing and responding to client wants and needs; the push came in trying to introduce analyst ideas into the market. The push side of the business meant that, of the 10 ideas that emerged from any morning meeting, individual salespeople filtered them down to those two or three ideas to be presented to the client in a personalized email, a quick call, or a voicemail. According to Perez, clients filtered this information by focusing first on the experience and conviction of the analyst, then on the simplicity and clarity of the message, and third on its degree of controversy—the extent to which the analyst’s view was “non-consensus”. The risk-reward approach generated resistance among salespeople because it introduced nuances and the likelihood of varied outcomes into the message. The effect was to suggest to clients that analysts had less conviction about their calls than what the market recognized. Concluded Perez: “That’s the reason why this is so complicated. That’s also the reason why you still need an anchoring point, which is the price target or base case. If you don’t have this base case, it won’t matter how interesting your message is, it will be unsellable.”

The initial reaction of the salesforce was a source of anxiety for research managers, Hurewitz recalled: “People’s first impression was, ‘If you are using this approach, you are not really telling me what you think. You are not taking a stand. You are hedging: you say the stock could go up but it could also go down.’ People felt that the analyst could be hiding behind this. The first reaction from sales and even clients was, “My clients want to know the analyst’s opinion.”

Despite such concerns, Stefan Pendert, head of research and distribution in Japan, saw the framework as an aid to client discussions: “For the salesforce, risk-reward was something that easily could be added to their client conversations. Sales has always had discussions with clients, and scenarios were employed in practice, but in an unorganized way. The risk-reward framework standardized an approach that brought the discussion with clients to a different level and allowed the salesforce to quickly see the directional skew of the call and quickly choose the scenario to focus on.”
Over time, noted Riefler, it became clear that both clients and the salesforce “loved it” when an analyst report showed significant upside or downside skew relative to the base case scenario. “A client who sees a 3:1 skew is going to be much more interested in a stock than in a stock where the variance from the base case is closer to 1:1.”

Quite a different challenge was the fact that analysts did not apply the risk-reward approach uniformly. In fact, Perez argued, “The ways in which analysts conducted investment research are so different and idiosyncratic from person to person that you can only go so far implementing the risk-reward framework at all.” In addition, Riefler noted, it could take up to two years for an analyst to master use of the framework. Dara Mohsenian covered Tupperware, a multinational consumer products firm that was heavily exposed to currency movements. In his view, the risk-reward model “makes the most sense in that the environment is volatile, and it’s impossible for an analyst to pinpoint what the right multiple or earnings number is going to be a year from now. The macro-variables change as well as currencies. In this environment, risk-reward makes perfect sense.” Mohsenian added that the requirement to identify key business drivers better helped identify the real debates around a company’s performance. Kathryn Huberty, who followed Apple and Dell, argued that the framework was best suited to companies such as Dell that were subject to long-term secular trends, the impact of which consensus views tended to underestimate, or, as in her case for Apple, when analyst conviction was strong and the market had not yet recognized the validity of that logic.

Impact and Opportunities

As Perez and his team reviewed their progress to date, they weighed the opportunities and risks that the framework presented Morgan Stanley. Greater transparency, for example, brought both advantages and risks. While the spotlight on analyst thinking had likely improved the quality of analyst analysis, it also had the potential to reveal analyst weaknesses. As the Morgan Stanley brand became increasingly identified with the risk-reward framework, moreover, maintaining high quality became more essential than ever. As yet, however, the research team had not rolled out a systematic methodology to measure the quality of analysis, and given that trading commissions paid by clients was for the bundle of attributes that Morgan Stanley offered, it was difficult to untangle the specific contribution of the risk-reward framework and its successful implementation. For example, whether the framework had in fact succeeded in minimizing behavioral biases was not as yet systematically tested.

Even so, Morgan Stanley’s research managers were convinced that the risk-reward framework was achieving their goals. Surveys conducted by third party interviewers revealed that clients appreciated aspects of the framework, often because it coincided with their own research approach. In addition, Morgan Stanley knew that while other firms occasionally mimicked the presentation of the risk-reward framework or mentioned sensitivity analysis in their own reports, no rivals were conducting systematic scenario analysis or presenting it as Morgan Stanley analysts did. Weyns’ team had found incremental positive returns in simulated Asia-Pacific portfolios using the scenarios data created under the risk-reward framework. Concluded Perez:

We have created an architecture of data points that we can now mine to understand what we are doing. In the first phase, we picked our battles. In the second phase, we standardized our processes. In the third phase, where we are right now, is to try to prove superior performance or information signals through what we are doing. Right now we are comparing performance of our price targets against a portfolio of the skew of distributions in our reports. The sample is not yet big enough to claim victory, but there are encouraging signs that one can assemble portfolios from this new approach that are superior to those that you could assemble solely on the basis of the price target.
Exhibit 1  Risk-Reward Framework Illustrated

Activision Blizzard Inc. (ATVI, $12, OW, $15 DCF)

Risk-Reward View: Strong holiday lineup could drive upside

<table>
<thead>
<tr>
<th>Fair Value $15</th>
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<tbody>
<tr>
<td>Upside Case 21x Upside Case 11e</td>
</tr>
<tr>
<td>$20</td>
</tr>
</tbody>
</table>
| Continued momentum, successful new launches, margin expansion: C2010E / C2011E non-GAAP revenue -5% / +8% YY as Diablo III is released in C2011E and Bungie partnership successfully offsets uncertainty with Call of Duty in C2011. Margin expansion continues as digital revenue increases. Operating margins expand to 32% in C2011E.

| Base Case 19x Base Case 11e |
| $16 |
| Transition to digital mutes revenue growth profile: C2010E / C2011E / C2012E non-GAAP revenue -4% / +2% / +8% YY as C2010 revenue mix shift to lower-priced software + digital and subscription-based WoW business leads to margin expansion. Operating margins expand to 30% in C2011E, vs. 26% in C2009.

| Downside Case 13x Downside Case 11e |
| $8 |
| Economy weighs on sales, margins negatively impacted: C2010E / C2011E non-GAAP revenue -11% / -5% YY as the challenging economy impacts sales and pricing. WoW loses momentum due to new competition. In addition, the growth of social / mobile gaming negatively impacts unit sales and pricing. High operating margins cannot be sustained.

Why Overweight?
- Industry leader and continued innovation
- Continued margin expansion owing to the shift to software / digital from low margin music bundles
- Subscription-based Blizzard titles providing high margin, stable revenue
- Potential upside to guidance
- Strong C2010E holiday lineup which includes Call of Duty: World of Warcraft: Cataclysm, and continued sales of StarCraft II

Current Debates
- Can AB successfully cycle against record-setting CoD sales?
- Will CoD become a subscription model and will geographic expansion be successful
- Does margin expansion make up for lower revenue growth profile
- Will AB continue to gain share?
- Where are we in the current console cycle and can AB show sustainable long-term growth?

Key Value Drivers
- Continued sales of key franchises, e.g., World of Warcraft (WoW), Call of Duty, StarCraft II, and Guitar Hero.
- Ongoing traction for Blizzard
- Improving profile as Guitar Hero product mix skews away from music bundles

Potential Catalysts
- Momentum in hardware sales owing to the releases of Kinect and Sony Move motion peripherals
- Return of sales growth for the industry
- Details around Bungie partnership

SWOT Analysis – Activision Blizzard

Strengths
1. Market leader with solid core franchises (Call of Duty, Guitar Hero, World of Warcraft)
2. Subscription-based WoW business provides stable revenue stream in cyclical industry

Opportunities
1. Innovation (MSFT’s Kinect, Sony Move) could lead to refreshed install base
2. Blizzard net and ability to convert addition titles to subscription models
3. Strong balance sheet gives AB strategic flexibility as the industry changes

Weaknesses
1. Cyclical industry dependant on console install base
2. Hit driven business that is dependent on the next big title release
3. Execution risks and need to avoid title delays

Threats
1. Changing distribution models (OnLive, etc.) could create opportunity or disrupt sales
2. New devices and $0.99 games on the iPhone could create low-priced alternatives
3. Weakness owing to competition from social games

Source: Morgan Stanley Research, Format based on Michael Porter’s Competitive Strategy.
Exhibit 1 (continued)

Risk-Reward Snapshot: BP (BP.L, Overweight, PT 500p)

Uncertain outlook, but risk-reward is skewed to upside

### Why Overweight?

**BP offers strong cash generation from a world-class portfolio:** BP’s resource base of c.64bn bbls is biased to high margin, conventional barrels.

**Relatively attractive valuation:** The shares are trading at 5.4x 2012 consensus PEs, which is a 20-25% discount to Total and Shell – we maintain our Overweight rating and argue that the relative call will be made between 450-500p/sh.

### Key risks

**Current uncertainty regarding the potential size of regulatory fines and punitive charges.**

**Significant delays and the possibility BP is banned from future offshore lease auctions in the GoM would have a negative read-through to the group’s production targets.**

**Asset sale at unfavourable prices:** Given company’s determination to sell assets to ensure sufficient funds for the oil spill liabilities, there is a risk of selling assets at discounted prices.

### Potential catalysts

**Diemission program:** Further asset disposals (target $25-30bn by end 2011).

**Presidential review:** An update on the outcome of the National Commission’s investigation into the Horizon incident, which could come in early 2011.

**Further internal restructuring:** Following the installation of Bob Dudley as CEO (1 Oct) and the recent creation of a new ‘Safety & Operational Risk’ division.

**Dividend resumption:** Expected with the FY10 results in Feb 2011.

---

**Source:** Company data, Morgan Stanley Research

---

**Price Target 500p**

**Potential Upside 16%**

We set our 500p price target based on a DCF valuation at MS Base case (LTS00/mbbl) Our DCF assumes a WACC of 7.5% and a 2% terminal growth rate. We estimate Macondo costs to be c.$40bn and assume a 30% depreciation in the value of the GoM portfolio due to moratorium to offshore drilling.

**Bull Case 675p**

(DCF) $105/bbl long-term oil prices; $7/bbl long-term refining margins: We assume 7.5% WACC, 10% cost inflation and a 2% terminal growth rate. We estimate Macondo costs to be c.$40bn and assume a 24% depreciation in the value of the GoM portfolio.

**Base Case 520p**

(DCF) $90/bbl long-term oil prices; $5.5/bbl long-term refining margins: We assume 7.5% WACC, 10% cost inflation and a 2% terminal growth rate. We estimate Macondo costs to be c.$40bn and assume a 30% depreciation in the value of the GoM portfolio.

**Bear Case 320p**

(DCF) $70/bbl long-term oil prices; $4/bbl long-term refining margins: We assume 7.5% WACC, a 2% terminal growth rate and no cost inflation. We estimate Macondo costs to be c.$40bn and assume a 50% depreciation to the GoM portfolio.

---

**Bull, Base, Bear valuations**

---

**Source:** Morgan Stanley Research
Exhibit 1 (continued)

Risk-Reward Snapshot:
Hitachi Construction Machinery (6305, ¥1,804, EW, PT ¥2,200)

**Investment Thesis**
- (1) Growing emerging market demand (mainly China).
- (2) Cyclical bottoming in developed markets.
- (3) Improved profit margins thanks to better regional mix driving industry recovery.
- Hydraulic shovel sales to China are emerging as the driver, making for high reliance on China within the machinery and capital goods industry.
- With high profit margins in emerging markets, improved regional mix will likely support earnings recovery.

**Key Value Drivers**
- Expansion in infrastructure and resource development related demand in emerging countries drive the firm’s earnings. But, as it relies significantly on overseas businesses, progressive yen appreciation is a negative for earnings.
- In the lucrative Chinese construction machinery market demand is setting into an upturn thanks to growth in infrastructure projects supported by economic support measures, recovery in mining-related demand, and revival of general urban construction.
- Risks include forex, prolonged sluggishness in the construction machinery markets in developed regions such as Japan, US and Europe, changes in monetary policy by the Chinese government, weak crude oil/commodity prices, and delays in increasing output due to production bottlenecks.

**Potential Catalysts**
- Stronger than assumed demand recovery in emerging countries.
- Demand expansion for mining machinery with a turnaround in crude oil/commodity prices.
- Earlier and larger than expected recovery in developed construction machinery markets (US/Europe/Japan).

---

**Price Target ¥2,200**
-derived from the base case

<table>
<thead>
<tr>
<th>Price Target ¥2,200</th>
<th>Bull Case</th>
<th>Base Case</th>
<th>Bear Case</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P/E 16 x</td>
<td>P/E 16 x</td>
<td>P/E 0.9 x</td>
</tr>
<tr>
<td></td>
<td>F/312x EPS</td>
<td>F/312x EPS</td>
<td>F/312x BPS</td>
</tr>
<tr>
<td></td>
<td>¥105</td>
<td>¥137.2</td>
<td>¥1,450</td>
</tr>
</tbody>
</table>

**Better-than-expected demand recovery in emerging and developed markets:**
Production bottlenecks resolve too, and the firm is able to increase output substantially. F/3/12 OP picks up to around ¥72bn, and EPS reaches about ¥165.
FV P/E 18x in line with the stock’s average in the early stages of its last earnings recovery in F/3:04-05.

**Emerging market demand expands and developed market demand bottoms:**
We expect execution issues to persist due to production bottlenecks, but still see F/3/12 OP recovering to ¥05bn and EPS to ¥137.2.
With production bottlenecks delaying production increases and leaving the firm exposed to ongoing execution risk, we assign a target valuation of P/E 18x, at an approx. 10% to the past average and below the stock’s average of 18x in the initial stages of the last earnings recovery in F/3:04-05.

**Emerging market demand recovery slows and developed market demand stays depressed:**
Here OP stays flat and little changed from the level of F/3/10. ROE remains low around 2%, and fair P/E drops to 0.9x.

---

Note: Share price as at October 26, 2010, close.
¥ = Morgan Stanley Research estimates.
Source: FactSet, Morgan Stanley Research.
Exhibit 1 (continued)

Netflix (NFLX, $153, Overweight)

Risk-Reward View: Secular Growth Thesis Intact

![Graph showing Netflix's performance]

**Why Overweight?**
- Investment in digital has significantly increased Netflix's consumer value proposition. Addressable market expands well beyond DVD rental.
- As more business shifts to digital, there is an opportunity to expand margins while continuing to improve content. Netflix op, margin of 12.6% in Q4, vs. premium TV at 25-30%.
- Netflix has created a scale-based competitive advantage around user experience and monetization of content that otherwise has limited value in the supply chain.

**Key Value Drivers**
- Strong growth in ending subscribers (+52% YOY in Q3).
- Expanding operating margin (12.6% in Q3 vs. 11.7% in Q3/09).
- Declining subscriber acquisition cost (SAC), we estimate $19.93 per gross subscriber add in Q3/09 (22% YOY).
- Netflix streaming device / content deals improve value proposition.

**Potential Catalysts**
- Uptake of digital offering on iPad / video game consoles / Apple TV.
- Licensing deals with studios that increase streaming content library.
- Streaming-only plan launch in the USA.

**Key Questions**
- How will the shift to digital streaming impact Netflix? Specifically, what impact will content deals have on gross margin?
- Will studios become more receptive of Netflix as a revenue stream?

**Key Risks**
- Competitive threat from the kiosk business model.
- Long-term risk from consumer shift to digital streaming, including competing offers, such as cable + satellite VOD / Amazon VOD / Apple iTunes / Hulu Plus / Wall-Street + Vudu / Best Buy CinemaNow.

**SWOT Analysis – Netflix**

**Strengths**
1. Market / brand leadership in subscription-based online streaming and DVD-by-mail.
2. Strong value proposition with “all-you-can-eat” subscription plans and hybrid distribution.

**Weaknesses**
1. Delivery by mail does not offer instant gratification.
2. Some competitors offer new releases to customers 25 to 30 days earlier than Netflix.

**Opportunities**
1. Continued subscriber growth acceleration due to success with digital streaming product.
2. Operating margin expansion as market shifts to digital.
3. International expansion.

**Threats**
1. Competitive threat from the kiosk business model.

Source: [Morgan Stanley Research, Framework based on Michael Portnoy’s Competitive Strategy]
Exhibit 1 (continued)

**Risk-Reward Snapshot: Reliance Ind. (RELI.BO, Rs1,093.1, EW, PT Rs1,118)**

**Risk-Reward View: Short Term Headwinds**

**Investment Thesis**
- Slowdown of gas ramp up;
- Petrochemicals – We believe the petrochemicals industry is set to enter a super-cycle in the longer term. However, in the near term, with large-scale capacity additions (especially in Asia and the Middle East), we expect margins and utilizations rates to improve only after the next two quarters
- Although worst in refining is behind us, we expect margins to reach normalized levels only in 2012
- Valuation now less attractive: On our F2012 estimates, RIL trades at a P/E of 15x and EV/EBITDA of 9x, broadly in line with market, richer than its global peers which trade at P/E of 10-12x and EV/EBITDA of 6-8x.

**Scenario Summaries**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Price Target (Rs)</th>
<th>Equal to our base-case scenario based on a SOTP analysis</th>
</tr>
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<tr>
<td>Bull Case</td>
<td>Rs1,118</td>
<td>Assumes: 1) Refining margins US$1.00/bbl higher than in the base case, reflecting higher petroleum product demand and delays in capacity expansion. 2) 5% higher petchem prices due to stronger-than-expected petrochemical cycle. 3) E&amp;P business 8bn bce reserves valued at US$9/bce, a 25% discount to average global comps 4) Investment valued at book value.</td>
</tr>
<tr>
<td>Bear Case</td>
<td>Rs614</td>
<td>Assumes: 1) Refining margins US$1.00/bbl lower than in the base case, reflecting lower petroleum product demand, 2) 5% lower petchem netbacks as new capacities come on stream and supply exceeds demand; and 3) lower gas production as the company has problems ramping up production.</td>
</tr>
</tbody>
</table>

**Bear to Bull Case: E&P to Drive Growth**

**Key Value Drivers**
- Increased reserve base for Reliance’s E&P business. RIL aims to have 10bn bce of reserves and 100 discoveries.
- Reliance’s refinery continues posting higher GRMs than peers.

**Key Catalysts**
- RIL signing gas contracts with various consumers for its entire gas production; higher global refining margins.

**Key Risks**
- A sharp decline in global economic growth that would likely compress our projected petrochemical and refining margins.
Note: Exhibit 1 comprises excerpts from research reports and should not be relied on as investment advice. This material is only as current as the publication date of the underlying Morgan Stanley research. For important disclosures, stock price charts and equity rating histories regarding companies that are the subject of the underlying Morgan Stanley research, see the Morgan Stanley Research Disclosure website at www.morganstanley.com/researchdisclosures.
Exhibit 2  Morgan Stanley Research, Organization 2010

Global Research Management

Source: Morgan Stanley.


**Exhibit 3**  The Fundamental Roots of Risk-Reward Analysis


**Exhibit 4**  Risk-Reward Scenarios Complement Quantitative Views of Risk


**Exhibit 5**  Conviction and the Risk-Reward Framework

Exhibit 6  Stock Selection Committee Requirements for Analyst Reports and Review Meetings

Highlight the investable insight and the logic behind it
• tell the client what to do with the security, and over what time horizon
• provide a succinct rationale for the investment recommendation
• communicate the level of your conviction (e.g., upside/downside or vs. other stocks)
• pinpoint upcoming catalysts and events

Explain what the market may be missing and why
• identify the market expectations that are discounted by the price
• quantify, if possible, how you differ from consensus
• justify what gives you confidence to challenge consensus (highlight proprietary work)

Outline risk-reward view based on scenarios with key value drivers
• identify and take a position on critical uncertainties
  (high value impact/high uncertainty)
• summarize the logic for your scenarios and underlying assumptions
• explain price target methodology and your view of the relative likelihood of scenarios
• discuss where you could be wrong: additional risk factors, extreme scenarios not modeled

Be prepared for an in-depth discussion on the following possible topics:

• material changes in industry trends and fundamentals
• competitive advantages that are not widely recognized
• inflection points in company’s business model and strategy
• logical integration of financial statements

Source: Morgan Stanley Research.
Exhibit 7  What’s in the Price

**What’s in the Price | Long-Term Growth Analyzer**

**What long-term earnings growth would justify the current price?**

This analyzer helps you understand the assumptions that the market is pricing into a stock — both today and on a historical basis — by calculating the long-term earnings growth rate implied by the current price, given near-term consensus estimates.

The tool uses a residual income model to determine the market’s expectation for long-term earnings growth. To do this, the model uses consensus estimates of earnings and dividends, uses the current price for intrinsic value, and solves for the terminal (long-term) growth rate (see graph below on the left).

**Implied Value of Long-Term Growth**

The tool derives an implied value of long-term growth (see graph above on the right) as follows:

- **Value of current earnings** is the value of the stock under a zero-growth scenario, i.e., assuming that the most current EPS is earned into perpetuity. We capitalize the most current EPS estimate at the cost of equity.

\[
\text{Value of Current Earnings} = \frac{\text{EPS}(0)}{K_e}
\]

- **The value of growth in the next three years’ forecasts.** We discount the EPS in the last explicit forecast period at the cost of equity and add the net present value of the dividends paid during this forecast period. Because we are only interested in the value from earnings growth in this explicit forecast period, we subtract the value of the current earnings to isolate the incremental value from the explicit forecast period. Note this value can be positive or negative.

Value of Growth in Explicit Period = present value of EPS in the 3rd forecast year (EPS(3)) plus the present value of dividends in the explicit period minus the value of current earnings.

\[
\frac{\text{Value of Growth in the Explicit Period}}{\text{Period}} = \frac{\text{EPS}(3)}{K_e} + \frac{\text{DPS}(1)}{(1+K_e)^2} + \frac{\text{DPS}(2)}{(1+K_e)^3} + \frac{\text{DPS}(3)}{(1+K_e)^4} - \frac{\text{EPS}(0)}{K_e}
\]

- **Implied value of long-term growth:** This value is simply the current price minus the value of current earnings minus the value of growth in the explicit period.

Source: Morgan Stanley Research
Exhibit 8  Scenario Probabilities Analyzer

What probabilities would the market assign to our Risk-Reward scenarios?

The analyzer uses option prices to calculate probabilities that the market would assign to our Risk-Reward Scenarios. It can highlight instances where we differ not just for the base case but also for our bull and bear cases.

Scenario Probabilities Analyzer – How to Use It

The probabilities on the chart indicate the market-implied chance of the stock ending beyond that price in one year. For each “>” scenario the chart shows the likelihood of being above that level at the end of one year. For each “<” scenario the chart shows the likelihood of being below that level at the end of one year. As a rule of thumb, probabilities less than 15% are potential tail candidates where scenarios are out of consensus.
Exhibit 8 (continued)

How It’s Calculated

The implied probability distribution is an approximate risk-neutral and model-free distribution backed out of traded option prices using an interpolated volatility surface. In a risk-neutral world (i.e., where we are not more adverse to losing money than eager to gain it), the fair price for exposure to a given event is the payoff if that event occurs, times the probability of it occurring. Worked in reverse, the probability of an outcome is the cost of exposure to the outcome divided by its payoff. In the options market, we can buy exposure to a specific range of stock price outcomes with a butterfly spread (long 1 low strike call, short 2 higher strikes calls, and long 1 call at an even higher strike). The probability of the stock ending in that range is then the cost of the butterfly, divided by the payout if the stock is in the range (in other words the risk/reward, as the cost is also the maximum loss on the trade). To find a smooth distribution, we price a series of theoretical call options expiring on a single date at various strikes using an implied volatility surface interpolated from traded option prices, and with these calls price a series of very tight overlapping butterfly spreads. Dividing the costs of these trades by their payoffs, and adjusting for the time value of money, yields the future probability distribution of the stock as priced by the options market.

Source: Morgan Stanley Research.
Endnotes


2 Boris Groysberg and Paul Healy, “The Future of Sell-Side Research,” working paper manuscript 2010, p. 9 refer to a 2003 Institutional Investor poll of buy-side investors and traders on the relative importance of research, sales and trading in allocating commissions. Investment managers valued research analysts (57% of commission dollars) over traders (25%), with the remaining 18% attributable to the sell-side salesforce. Buy-side traders allocated 41% of commissions paid for research, 50% to trading, and 9% to sales. Groysberg and Healy also cite a Greenwich Associates poll concluding that the buy-side attributed nearly 40% of commissions as compensation for research.


4 Ibid.

5 Ibid., p. 3.

6 Ibid., p. 2.

7 Ibid.

8 Ibid., p. 4. Emphasis in original.

9 Ibid.

10 Ibid., p. 5.

11 Ibid.

12 Ibid.

13 Ibid., p. 6.

14 Ibid.

15 Ibid.

16 Ibid., p. 9.

17 Ibid., p. 10.
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Morgan Stanley’s Risk-Reward Views: Unlocking the Full Potential of Fundamental Analysis

by Guy Weyns, Juan-Luis Perez, Barry Hurewitz, and Vlad Jenkins, Morgan Stanley*

Fundamental analysts are valued for their expertise in identifying and tracking the underlying drivers of profitability and value in different industries and companies. The analysts try to understand how a company is positioned within an economy and a sector, how it creates or destroys value, and how its key value drivers are likely to evolve in the future. To that end, they model and forecast revenues and expenses, operating cash flow, capital expenditures and funding requirements, and the return of capital to shareholders through dividends and share repurchases.

But for all its use of numbers and data, fundamental analysis remains a highly subjective undertaking, one that relies heavily on the exercise of judgment in coming up with price targets for and making calls on individual stocks. One predictable result of this subjectivity has been the proliferation of sell-side analyst methods and styles. But if this proliferation has produced its share of successes and star analysts, it has also led to “quality control” challenges.

In recent years, Morgan Stanley’s equity research group has responded by developing a “risk-reward” framework and structure that aims to provide guidelines for its analysts while leaving room for individual initiative and insight.1 The framework was developed by exploring the following possibility: Can the discipline of fundamental equity analysis be linked to and made consistent with the quantitative framework of modern portfolio theory, with its focus on the risk-reward relationship in capital markets and its reliance on more objective, market-based variables such as expected return, volatility, and beta?

Part of the answer is straightforward. When active portfolio managers choose stocks, they are evaluating investment opportunities for their potential to produce “alpha,” or positive excess returns. Forecasts of alpha are central to the exercise, and many market participants resort to “deep-dive” fundamental analysis to generate them. When fundamental analysts translate their view into a price target for the stock, investors can derive the forecast alpha by first converting the price target into an expected return, and then subtracting from that expected return some measure of the market’s required return that is based on the stock’s beta, volatility, or some other historical measure of risk.

So far so good, but this is only half the story. Investors also need a forward-looking measure of risk. Active portfolio managers are evaluated based not only on their realized alphas, but also on the risks they take to generate those returns. Providing such an evaluation is the main use of the Information Ratio, which is a key metric in modern portfolio management. Expressed as an equation,

\[
IR_p = \frac{\text{alpha}_p}{\text{sigma}_p}
\]

where alpha is the residual return of the portfolio vs. the benchmark, and sigma is a measure of the residual risk of the portfolio relative to that of the benchmark. The Information Ratio, much like its more widely used cousin the Sharpe Ratio, gives us a sense of an investment’s risk-adjusted alpha, or alpha per additional unit of risk. Clearly, we all prefer to produce the highest alpha with the least amount of residual risk.

As typically practiced, however, fundamental equity analysis remains outside this risk-return framework, and equity analysts contribute little to investors’ efforts to assess risks as well as expected returns. This disconnect can be seen most clearly in the single-point estimates and one-dimensional investment theses that still prevail in sell-side research.

Our view is that such practices reflect an outdated view of the world, and a misguided attempt to project an analyst’s conviction and expertise.

Quant-Only Risk Measures Are Incomplete Without Analysis of Fundamentals

In the absence of forward-looking measures of risk from fundamental analysts, many portfolio managers resort to quantitative frameworks. The simplest approach is to use the volatility of historical returns as a forecast of future risk. Many also use sophisticated, back-tested, multi-factor models to forecast the risks of portfolios or individual stocks.

But despite their seductive rigor and often impressive results, such quantitative approaches to risk have significant

* The authors wish to thank Trevor Harris for his extensive contribution to the development of Morgan Stanley’s Risk-Reward Framework.

The Fallacy of Single-Point Estimates

And that brings me to my final point...which has to do with the fallacy of setting price targets, or single-point estimates of intrinsic value. I believe you should always think about investments in terms of probabilities—that is, possible ranges of values, with probabilities assigned to each value. You should say to yourself “if A, then B….” People like Warren Buffett do this more or less instinctively. That concept is also completely hardwired in Bill Miller’s thinking and investment approach.

Thinking in terms of the probability distributions rather than just expected values is not only useful analytically because it forces you to consider different scenarios, it’s also very important psychologically…. the approach provides what I would call ‘psychological cover.’ A stock trading below expected value may reflect a 20% chance that event XYZ will happen and the stock will turn out to be worth less than today’s price. And this, of course, means that there is a one-in-five chance the stock will go down. The important thing is taking into account the 20% probability. Viewed in this light, an analyst’s decision may have been a good one, even if the outcome is spoiled by an unfavorable draw from the distribution.”

Michael Mauboussin,
Chief Investment Officer, Legg Mason


Limitations. For starters, they require the use of restrictive assumptions for mathematical convenience or computational simplicity. But more importantly, in most cases quantitative risk forecasts are essentially more or less sophisticated extrapolations of the past. They cannot directly incorporate forward-looking, nuts-and-bolts information about the alternative paths that a company’s value drivers might follow in the near to medium term.

To see how this kind of information could help investors calibrate the risk-reward profile of an investment, consider the case of a mature, cash-generating public company in the context of a thriving private equity and LBO market. Without a fundamental view of the upside potential and downside risk of this investment that takes account of this context, investors would have to make do with a quant forecast of future volatility generated by a predictive risk model.

But there is a major potential problem with the use of a quant-only risk model in these circumstances: its failure to capture the possibility of a significant change in the general business and market conditions that have made a buyout of the company a plausible outcome. Quant-only risk models cannot possibly integrate the full range of an analyst’s insights related to critical questions such as:

- Is the current ownership structure of the company an impediment to an LBO?
- What is an acceptable target capital structure, how feasible is it to raise the necessary financing, and what would be the effect on ratings and funding cost?
- To what extent could the underfunded pension plan become a deal breaker?
- What are the operating strategy alternatives after a buy-out?
- Are there any management talent retention issues?
- What is a reasonable range of exit horizons and exit multiples?
- How will the stock be perceived after a failed LBO attempt?
- What is the market-implied probability of the LBO’s happening?

Experienced fundamental analysts instinctively analyze and weigh the relative importance of such risk factors before arriving at a recommendation for the stock. Unfortunately, the full extent of their analysis and insight cannot be collapsed into a single-point estimate of value or price. Not only does a single-point estimate convey a false sense of certainty and accuracy, but—and more importantly—the use of such estimates fails to help investors understand how the analyst became comfortable with the risk-reward tradeoff of the investment.

In contrast to quant-only approaches, Morgan Stanley’s new risk-reward approach encourages analysts to think probabilistically about the ranges of uncertainty related to fundamental value drivers. Modern-day research in financial economics—much of which has proven to be useful in investment practice—comes to grips with uncertainty by considering any value driver (e.g., revenue, cash flow or earnings growth) to have a set of probabilities for the range of possible future outcomes. Such an approach begins with the premise that any risk factor, including fundamental value drivers, can be summarized by the probability distribution of its possible future values—and that the risk itself can be
We encourage our analysts to think probabilistically about key value drivers. Looking for opportunities to narrow the range of uncertainty. And improve estimates of expected outcomes.

Figure 1  Thinking Probabilistically About Key Value Drivers Is the Basis of Fundamental Risk-Reward Analysis.

quantified by the standard deviation of that distribution (see Figure 1).

But not all risks lend themselves to this approach. And we hasten to add that complex quantitative methods are not essential for fundamental analysts to contribute valuable insights that can yield a forward-looking fundamental measure of risk. We believe that an analyst’s fundamental view of the risk-reward tradeoff—however qualitative—is the valuable missing link between fundamental analysis and the practices of modern portfolio management. Of course, any investment context is clouded by uncertainty, but we can still try to understand and limit that uncertainty with analysis by asking questions like: What would have to happen to the fundamentals of the company for the stock to go down 15%? And are the odds biased to the upside or to the downside? We need to get to the analyst’s view on the range and the shape of the distribution of possible outcomes for the business. And in most cases, we can accomplish this as long as we remember to aim primarily for clarity, not false precision.

Limiting the Focus. But one more point before discussing the Morgan Stanley approach in detail: One of the fundamental analyst’s most important jobs is to focus the attention of buy-side clients on just the critical uncertainties. Trying to understand, model, and communicate one’s views on all the value drivers and all the possible scenarios associated with them can quickly become an incredibly complex undertaking, creating confusion rather than insight. That is why we start our analysis by pinpointing the “critical uncertainties”—that is, a small carefully selected set of key value drivers that can have a large impact on value and a wide range of plausible outcomes. In most cases, moreover—and with the same goal of seeking clarity and avoiding unnecessary complexity—we have found that three scenarios are plenty.

Of course, such a scenario-based, fundamental approach to risk-reward analysis will never yield the continuous probability distributions and confidence intervals produced by quant-only approaches. But we are convinced that attempts to force fundamental analysis of risk in this direction would produce at best the illusion of precision, which can produce complacency as well as misleading expectations in clients. Our aim is instead to extract as much risk information as possible from the analysts’ fundamental analysis and, as illustrated in Figure 2, from the small number of scenarios that can serve as a useful approximation for the underlying distribution.

Morgan Stanley’s Risk-Reward View

With significant help from over 1,500 of our clients (through interviews, focus groups, and surveys) we have tried to identify systematically what we call “unmet client needs”—steps in the investing process that investors themselves consider very important but where they express dissatisfaction with their own ability to accomplish their goals. We sifted through over 250,000 individual answers related to 450 steps in the investment process followed by buy-side portfolio managers, analysts, and traders at both long-only and hedge fund institutions around the globe.

Although the view we gained may be unparalleled in detail, it was also very closely aligned with the picture one gets in anecdotes from some of the world’s leading investors. After listening to them, and to our clients, we have become convinced that sell-side research can add the greatest value through a disciplined approach to identify the following:

• Key investor debates
• Value drivers related to those debates
• Current market expectations
• A full range of plausible scenarios
• New evidence not yet reflected in market prices, and
• A clear investment recommendation supported by the above (i.e., a Risk-Reward View)

Many of these investor goals, and opportunities for sell-
In assessing risk, a beta purist will disdain examining what a company produces, what its competitors are doing, or how much borrowed money the company employs. He may even prefer not to know the company’s name. What he treasures is the price history of its stock. In contrast, we’ll happily forgo knowing the price history of its stock and instead will seek whatever information will further our understanding of a company’s business. The theoretician bred on beta has no mechanism for differentiating the risk in, say, a single-product toy company selling pet rocks or hula hoops from that of another toy company whose sole product is Monopoly or Barbie. But it’s quite possible for ordinary investors to make that distinction if they have a reasonable understanding of consumer behavior and the factors that create long-term competitive strength or weakness. Obviously, every investor will make mistakes. But by confining himself to a relatively few, easy-to-understand cases, a reasonably intelligent, informed and diligent person can judge investment risks with a useful degree of accuracy.”


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**Warren Buffett on Scenario Analysis**

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**Figure 2 Three Fundamentals-Based Scenarios Can Help Complement the Quant-Only View of Risk T+12m**

Our three fundamentals based scenarios are a useful approximation T
These three scenarios form our Risk-Reward Spotlight
T T+12m T T+12m
Bull base bear

Quant approaches yield a continuous probability distribution

Our three fundamentals-based scenarios are a useful approximation T
These three scenarios form our Risk-Reward Spotlight
T T+12m T T+12m
Bull base bear

As mentioned earlier, our analysts express their view of the risk-reward tradeoff for a given stock by projecting its intrinsic or fair value under three fundamental scenarios:
- **Base Case**, corresponding to what analysts typically provide in the absence of any risk-reward analysis. Often, though not always, the analyst’s price target for the stock will be derived from the base-case scenario.
- **Bull Case**, or upside case
- **Bear Case**, or downside case

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4. We use both terms because estimating intrinsic value is typically associated with a detailed, multi-period forecast and valuation approach (e.g., DDM, DCF or Residual Income), while fair value can also include short-hand approaches based on valuation multiples (e.g., a stock’s P/E ratio compared to a peer company average or median).
**Risk-Reward View: Globalmark plc (GLBM.L, 612p, OW, PT 735p)**

**Risk-Reward Spotlight:**

**Pace of FairView’s int’l expansion skews risks firmly to the upside**

**Investment Thesis**

- Based on multiple site visits, we strongly believe that the international expansion of the FairView subsidiary is accelerating at a pace that significantly exceeds what is implied in Globalmark’s current share price
- FairView’s GPSecure™ product line faces little competition from local players as they struggle to catch up with complex nanotechnology requirements. This translates into commensurate near-to-medium-term pricing power and margin robustness, which we factor into our intrinsic value model
- Accordingly, our base case forecasts of 2H07 and FY08 EPS are 17% and 23% above consensus respectively
- Investors appear overly focused on the EU’s regulatory review of Globalmark’s trade practices. A closer analysis of facts and arguments leads us to assess the relative likelihood of an unfavorable outcome as very low. Given the timeline of the process, however, we expect the regulatory overhang to continue well into 1H08, when a decision is expected
- **Dividend watch:** based on Globalmark’s solid cash flow generation, the recently completed capex program, and a payout ratio that has lagged its peers for the last 5 years, we forecast a sharp dividend increase of 27%, to 32p per share for FY07

**Key Value Drivers**

- Top line growth at FairView’s international operations
- Competitive strength of GPSecure™ product line
- Cash flow generation momentum coupled with lagging dividend payout ratio
- Outcome of EU review of Globalmark’s trade practices

**Potential Catalysts**

- Announcement of 2H07 results; contribution of FairView business
- Introduction of credible competitive products (e.g., SafeTracker™)
- Announcement of FY07 final dividend
- EU decision on trade practices in 1H08; intermediate press announcements on progress of review

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**Price Target:**

<table>
<thead>
<tr>
<th>Case</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bull</td>
<td>735p (+20%)</td>
</tr>
<tr>
<td>Base</td>
<td>735p (+20%)</td>
</tr>
<tr>
<td>Bear</td>
<td>520p (-15%)</td>
</tr>
</tbody>
</table>

**Bull Case:**

Disputes: FairView’s international expansion disappointed due to sales support bottleneck in emerging markets: 20% in FY07 and 35% in FY08. Margins under pressure from unfavorable decision in EU review and SafeTracker™ introduction in 2009. No FY07 dividend increase.

**Base Case**

The FairView offensive: FairView’s top line growth accelerates to 35% in FY07 and 45% in FY08 due to higher-than-expected adoption of GPSecure™ line, particularly in Eastern Europe and mainland China. Margins remain at present levels for 3 years before trending down. FY07 dividend up 27% on the back of free cash flow momentum. Favorable decision in EU review of Globalmark trade practices.

**Bear Case**

Disappointments: FairView’s international expansion disappoints due to sales support bottleneck in emerging markets: 20% in FY07 and 35% in FY08. Margins under pressure from unfavorable decision in EU review and SafeTracker™ introduction in 2009. No FY07 dividend increase.

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**Source:** Company data, Morgan Stanley Research
Occasionally, an investment context will warrant description by more than three scenarios. For example, we may have to address the potential consequences of an additional, very low-probability event that is nonetheless a topic of discussion in the market. And in some cases, the nature of the distribution of future outcomes for the business could require us to use four or five distinct scenarios. But whatever their number, the scenarios that inform our Risk-Reward Views must be coherent, relevant to current investment debates, and represent a full range of plausible outcomes.

At the same time, we recognize that attaching precise probabilities to these scenarios is an unrealistic, and at worst potentially misleading, goal. It would be ideal if every analyst could consistently come up with 68% confidence intervals for the 12-months-ahead stock price, with bull- and bear-case scenarios based on deep-dive fundamentals. But the real-world business scenarios that inspire investor debate—for example, about the likely success of a restructuring effort, or the probability of achieving critical market share in a recently launched product line—do not correspond to textbook confidence intervals or standard probabilities.

Nevertheless, the chosen scenarios and the price target must clearly reflect the analyst’s view of any bias, or skew, in the odds of making money vs. losing money. And to ensure logical consistency, we set out some clear rules for our analysts when setting price targets and expressing views on the relative likelihoods of alternative scenarios.

But this begs the question: Why should we continue to attach any importance to price targets when we argue that a stock’s risk-reward profile is all the raw material we need to make an investment decision?

A price target by itself—or any single-point estimate—is not very informative. It may appear to convey a high level of conviction; but unless the estimate is placed within the context of a well articulated Risk-Reward View, the basis for that conviction remains unclear. Surely, not all stock calls with a 20% expected return price target convey the same level of conviction about the underlying uncertainty. But when presented as an output of our Risk-Reward approach, a price target can be very insightful since it should contain, whether explicitly or implicitly, the analyst’s view about the relative likelihood of alternative scenarios playing out. If every analyst assigned explicit scenario probabilities, it would be logical to expect the analyst to set the price target at the probability-weighted average of the fair values for the scenarios. But although our analysts are free to assign explicit, subjective probabilities to their scenarios, we have chosen not to make the practice mandatory in order to avoid contributing to this illusion of precision.

At the same time, we do apply some strict internal consistency rules in those cases where analysts do not provide explicit probabilities. In such cases, fair value-based price targets should at least reflect the implicit relative weight that the analyst would attribute to the various scenarios. In the Globalmark case, for example, a price target of 735p (upside of +20%) would clearly be inconsistent with the risk-reward analysis if the analyst considered the bear-case scenario (downside of -15%) twice as likely as the bull-case scenario (upside of +35%).

What’s more, even if the analyst provides neither explicit probabilities nor price targets, the risk-reward analysis itself can still constitute a clear recommendation. In this case, internal consistency requires that the bull- and bear-case scenarios be of approximately equal probability. Using again the Globalmark example but without the price target, the interpretation of the analyst’s view should now be that we are as likely to make 35% as we are to lose 15% over the next 12 months—and thus the risks are skewed to the upside. But whether they are sufficiently skewed to the upside to make the investment will depend on the individual investor’s objectives and constraints.

Although price targets are typically based on expected fair value, they don’t have to be. Analysts may take other, non-fundamental market dynamics into account when setting price targets, as long as they provide an adequate explanation. The reality, of course, is that investors make money by being right about a stock’s price movements over their selected time horizon. They don’t necessarily make money by being right about a stock’s intrinsic value per se at any given time. And saying that a stock is mispriced—whether “overpriced” or “underpriced,” “expensive” or “cheap”—implies two things:  
- a benchmark exists against which we can assess the current price (mispriced versus what?)
- the market has got it wrong, i.e., the consensus view differs materially from the view expressed in the benchmark.

So far we have discussed price targets as being based on an intrinsic value or fair value benchmark. The implied assumption is that although a stock’s price may temporarily diverge from our best estimate of intrinsic value because of “sentiment,” “momentum,” “short-term noise,” or a misguided focus on certain fashionable valuation metrics, over the longer term the fundamentals will exert a gravitational pull that brings the market “back to its senses.”

But we see a few problems with an approach to investment that relies exclusively on this assumption:

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5. For normally distributed returns, 68% confidence intervals roughly correspond to a range extending one standard deviation from the mean (expected) return in each direction.

6. That is, if the analyst sets the price target on the basis of intrinsic value or fair value, which is the most commonly used approach. As we discuss in the next paragraph, analysts occasionally deviate from this when they consider that prices are driven by market dynamics other than reversion to fair value. See Expectations Investing (Harvard Business School Press, 2001), by Alfred Rappaport and Michael Mauboussin, for a more detailed discussion of the expected value approach.

7. Since we give our analysts the option to assign explicit probabilities to the scenarios or not, this logic needs to hold for the sake of internal consistency. For example: a bull case of +35% and a bear case of -15% would not allow us to safely conclude that the risks are skewed to the upside if, in the mind of the analyst, the bear case were twice as likely as the bull case.
• Catalysts, or triggers, are typically required to prompt the market to revise its expectations. Without such catalysts, market biases at odds with fundamentals can persist for extended periods.

• Being right in the long term (strategically) but wrong in the short term (tactically) can involve a lot of pain. Even for portfolio managers with a clearly stated medium- to long-term investment horizon, short-term volatility can hurt.

• Not every successful portfolio manager has a medium- to long-term investment horizon.

For any or all of these reasons, with the aim of adding maximum value to our clients’ investment process, our analysts will occasionally make a “price call” on a stock that is not driven by the intrinsic value they derive based on pure fundamental analysis.

To support the standard Risk-Reward View, our analysts publish explicit summaries of the investor debates pertinent to a stock, differentiating clearly between the current market view and expectations related to that debate and our own view. Conversations with investors who are most active in a specific stock are critical to identifying market expectation and answering the question, “What’s in the Price?” But analysts also use a growing library of “What’s in the Price” analytics to help them identify quantitatively the assumptions that one would have to make to justify the current price. For instance, one popular approach is to back into the long-term earnings growth rate implied by the current price, given near-term consensus estimates. For example, as shown in Figure 4, the market’s current estimate of long-term growth for MasterCard, at 1.8%, is significantly lower than it had been a couple of years earlier. This can open an interesting discussion: have there been any significant changes in the company’s business model, and do these changes warrant the change in the market’s view of long-term growth prospects?

Another “What’s in the Price” analyzer helps analysts identify the probabilities that the market would assign to the stock trading above or below levels indicated by our Risk-Reward Scenarios. Figure 5 illustrates how we can use implied volatility data from the derivatives market to estimate the probabilities that the market would assign to our analysts’ scenarios. In this example, it appears that the market sees a probability of less than 5% that the stock would be trading at a level above the analyst’s $75 bull case for the stock 12 months from now. Analysts may use this calculation to challenge the market-implied probability and highlight their conviction that the market may be underestimating the potential for upside scenarios.8
Communicating Levels of Conviction

By moving from single-point estimates of value or price, to a fundamental view on the risk-reward tradeoff of any investment, Morgan Stanley’s analysts are also providing greater clarity about the level of conviction underlying their investment recommendations. Investors can assess conviction by examining the analysts’ perception of downside and upside risk around a base case. Higher-conviction calls should be supported by more favorable risk-reward profiles, as illustrated in Figure 6, not merely annotated with labels indicating “high,” “medium” or “low” conviction.

A higher-conviction idea must mean that the analyst perceives the likelihood of adverse outcomes for the value drivers and catalysts of a stock to be lower than for a lower conviction idea, and vice versa. Conviction must be tightly linked to perceived risk, even if only implicitly. Our Risk-Reward Views put more structure on this too loosely defined concept by framing it in terms of the shape of the underlying probability distribution as perceived by the analyst. This approach is more transparent than qualitative statements like: “My highest conviction idea is a buy on stock A with upside of 20%, while my lowest conviction idea is a sell on stock B with downside of 15%.”

Indeed, it is precisely because the risk-reward profiles can be traced to alternative scenarios for the stock’s value drivers that conviction becomes fully transparent and debatable. Investors may disagree—in fact, we expect they often will—with the specific value driver assumptions underlying

Communicating Levels of Conviction

Quantifying Conviction

A prominent example of a quantitative approach to conviction can be found in the Black-Litterman (“BL”) model of asset allocation.9 The BL model is a widely adopted quantitative portfolio construction method that overcomes some well-known problems associated with simple mean-variance optimization (e.g., unintuitive and highly concentrated portfolios, high input sensitivity). It allows portfolio managers to input their own views on the expected performance of specific assets or asset classes, sectors and regions. But it also asks them to assign an explicit level of confidence or conviction for each view, expressed as the variance of a normal distribution centered on the expected return. Higher-conviction views will have smaller variance around the expected return than lower-conviction views. As a result, the optimal asset allocation produced by the model will be weighted more heavily in higher-conviction views. Conviction is about perceived risk, and perceived risk is about how an analyst or investor thinks about the range and relative odds of possible future outcomes for the stock.

The BL model thus makes the link between the otherwise too loosely defined notion of conviction, a directly forward-looking view on risk, and the quantitative framework of modern portfolio management.

But a critical point was that while the result may have been bad, the investment decision wasn’t necessarily wrong. After a deal broke up, we’d always reexamine it, looking for clues we might have missed. But even a large and painful loss didn’t mean we had misjudged anything. As with any actuarial business, the essence of arbitrage is that if you calculate the odds correctly, you will make money on the majority of deals and on the sum total of all your deals. If you take a six-to-one risk, the foreseeable risks will occur and you will lose money every seventh time. Other times deals will break up for reasons that you could not reasonably have foreseen (a potential that also needs to be worked into your calculations). To an outsider, our business may have looked like gambling. In fact, it was the opposite of gambling, or at least of most amateur gambling. It was an investment business built on careful analysis, disciplined judgments—often made under considerable pressure—and the law of averages.”

Robert Rubin, In an Uncertain World—Tough Choices From Wall Street to Washington, p 46

Robert Rubin on Recognizing Good Decisions with Bad Outcomes

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Conclusion
The simple but powerful idea behind the Risk-Reward View is that an investment decision process that consistently focuses on the most favorable risk-reward tradeoffs will produce superior results in the medium to long term. It is no more complicated than the law of large numbers applied to odds that are skewed consistently in our favor. Unfavorable scenarios are bound to materialize from time to time. But if the a priori risks are correctly calibrated, an investment approach based on fundamental Risk-Reward Views should outperform, on average, an investment process based on single-point estimates. It’s simply a matter of winning by consistently playing the most favorable odds.

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