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The Risk-Reward Framework at Morgan Stanley Research

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.[1] 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.

Professor Suraj Srinivasan and Global Research Group Senior Researcher David Lane prepared this case. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

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[2] 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 jousted 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.[3] 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."[4] 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."[5]

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."[6] 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."[7]

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."[8] 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."[9]

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"[10] (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"[11] 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,"[12] 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."[13]

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[a] 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.[14] 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.[15]

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."[16] 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."[17]

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.

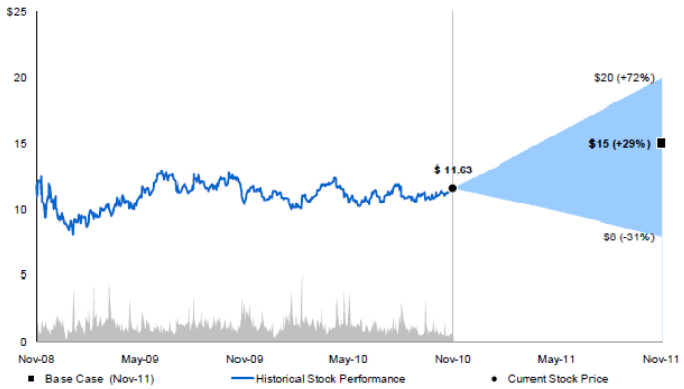
Even so, Morgan Stanley's research managers were convinced that the risk-reward framework was achieving their goals. Surveys conducted by third party interviewers revealed that clients appreciated aspects of the framework, often because it coincided with their own research approach. In addition, Morgan 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



Fair Value $15		Fair value of $15 is based on our 10-year DCF model.
Upside Case $20	21x Upside Case 11e EPS of $0.95	**Continued momentum, successful new launches, margin expansion:** C2010E / C2011E non-GAAP revenue -5% / +8% Y/Y 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 $15	19x Base Case 11e EPS of $0.80	**Transition to digital mutes revenue growth profile:** C2010E / C2011E / C2012E non-GAAP revenue -4% / +2 / +8% Y/Y 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 $8	13x Downside Case 11e EPS of $0.60	**Economy weighs on sales, margins negatively impacted:** C2010E / C2011E non-GAAP revenue -11% / -5% Y/Y 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.

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	**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
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	**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*.

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

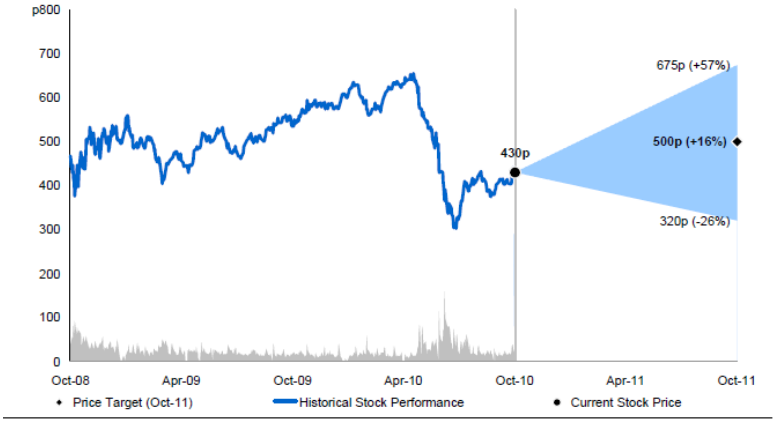
Risks / Concerns

- Uncertainty surrounding *CoD* future
- Shifts in consumer spending trends
- Seasonal / cyclical nature of Interactive Entertainment market
- Additional product delays
- Regulatory risk in China

Exhibit 1 (continued)

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

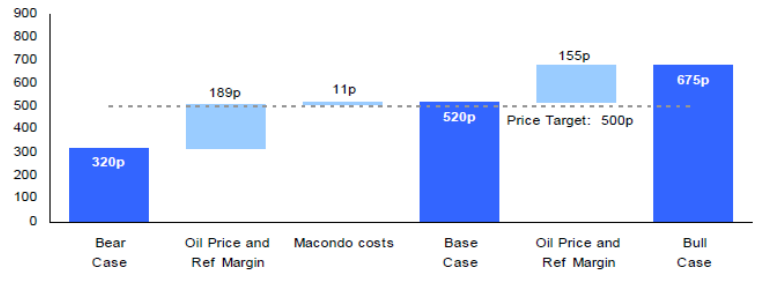
Uncertain outlook, but risk-reward is skewed to upside



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 (LT$90/bbl) 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

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

Divestment 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.

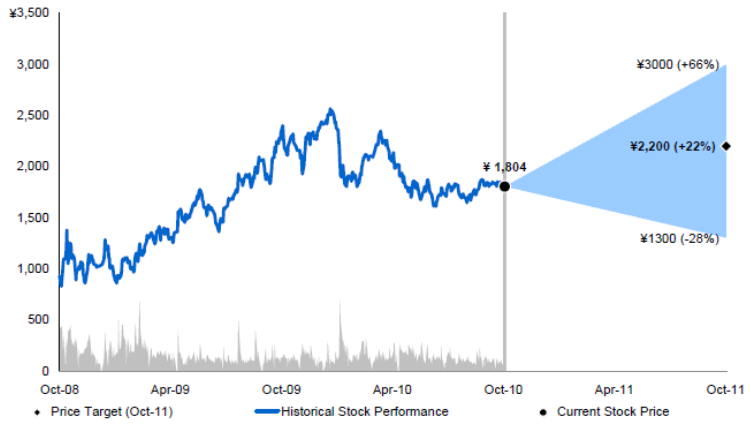
Further internal restructuring: Following the installation of Bob Dudley as CEO (1 Oct) and the recent creation of a new 'Safety & Operational Risk' division.

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

Exhibit 1 (continued)

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

Risk-Reward View: Our second pick after Komatsu; big China benefits



Price Target ¥2,200		Derived from the base case
Bull Case ¥3,000	P/E 18 x F3/12e EPS ¥165	**Better-than-expected demand recovery in emerging and developed markets:** Production bottlenecks resolve too, and the firm is able to increase output substantially. F3/12 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 F3/04-05.
Base Case ¥2,200	P/E 16 x F3/12e EPS ¥137.2	**Emerging market demand expands and developed market demand bottoms:** We expect execution issues to persist due to production bottlenecks, but still see F3/12 OP recovering to ¥65bn 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 16x, 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 F3/04-05.
Bear Case ¥1,300	P/B 0.9 x F3/12e BPS ¥1,450	**Emerging market demand recovery slows and developed market demand stays depressed:** Here OP stays flat and little changed from the level of F3/10. ROE remains low at around 2%, and fair P/B drops to 0.9x.

Note: Share price as at October 26, 2010, close
e = Morgan Stanley Research estimates
Source: FactSet, Morgan Stanley Research

Investment Thesis

- (1) Growing emerging market demand (mainly China), (2) cyclical bottoming in developed markets and (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 settling into an uptrend thanks to growth in infrastructure projects supported by economic support measures, recovery in mining-related demand, and revival of general urban construction.
- **Risks factors** 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.

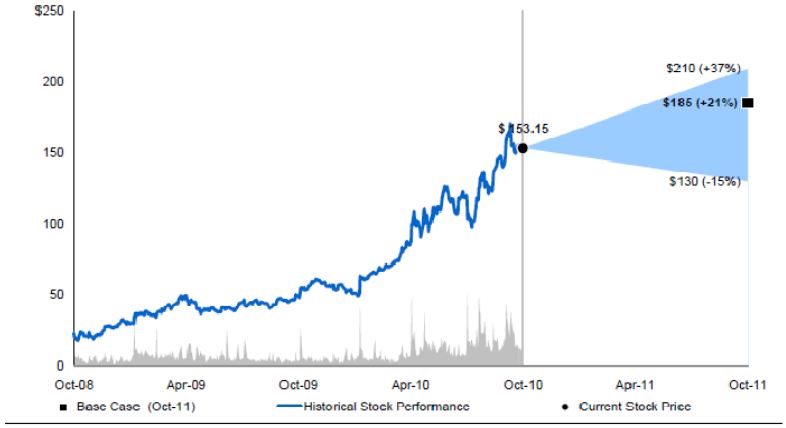
Potential Catalysts

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

Exhibit 1 (continued)

Netflix (NFLX, $153, Overweight)

Risk-Reward View: Secular Growth Thesis Intact



Source: FactSet, Morgan Stanley Research estimates

Fair Value $185		Fair value of $185 is based on our DCF model
Bull Case $210	17x Upside Case C12e EV / EBITDA	**Accelerated share gains + margin expansion as Netflix keeps digital competitors at bay; material international contribution.** Continued lead in digital video monetization. 5-year revenue CAGR of 21% (C2010E-C2015E), operating margin of 26% by C2015E.
Base Case $185	17x Base Case C12e EV / EBITDA	**Subscriber growth continues to accelerate, margins improve long-term on fixed-cost leverage.** Subscriber growth accelerates to +60% Y/Y in CQ4E, streaming content costs increase to ~20% of revenue by CQ4E. 5-year revenue CAGR of 21% (C2010E-C2015E), operating margin of 24% by C2015E.
Bear Case $130	16x Downside Case C12e EV / EBITDA	**Strong competition from kiosks and digital, margins pressured from costs of digital streaming content.** Competition from kiosks / VOD pressure share gains. 5-year revenue CAGR of 19% (C2010E-C2015E), operating margin of 22% by C2015E.

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 3. Broadest digital device penetration among streaming providers	**Weaknesses** 1. Delivery by mail does not offer instant gratification 2. Some competitors offer new releases to customers 28-days earlier than Netflix
Opportunities 1. Continued subscriber growth acceleration due to success with digital streaming product 2. Operating margin expansion as model shifts to digital 3. International expansion	**Threats** 1. Competitive threat from the kiosk business model 2. Long term risk from consumer shift to digital streaming including competing offers, such as cable + satellite VOD / Amazon VOD / Apple iTunes / Hulu Plus / Wal-Mart + Vudu / Best Buy CinemaNow

Source: Morgan Stanley Research, Framework based on Michael Porter's *Competitive Strategy*

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 C2010E, 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% Y/Y in CQ3)
- Expanding operating margin (12.6% in CQ3 vs. 11.7% in CQ3:09)
- Declining subscriber acquisition cost (SAC), we estimate $19.93 per gross subscriber add in C2010E (-22% Y/Y)
- 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?

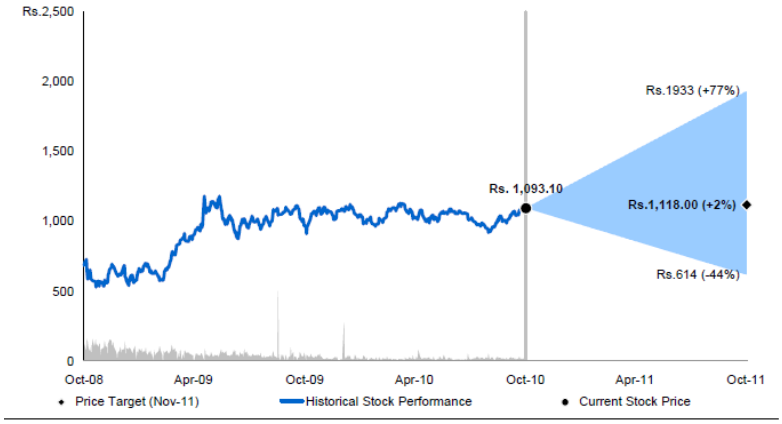
Key Risks

- Competitive threat from the kiosk business model / increasing competition in digital video
- Rising digital content licensing costs

Exhibit 1 (continued)

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

Risk-Reward View: Short Term Headwinds

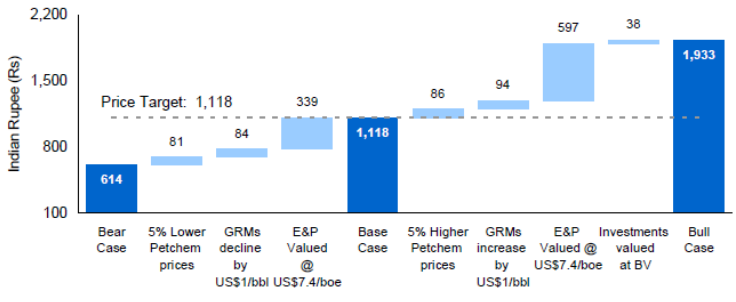


Note: Historical price data does not reflect the most recent stock split.

Scenario Summaries

Price Target Rs1,118		Equal to our base-case scenario based on a SOTP analysis
Bull Case Rs1,933	23x Bull Case F12e EPS	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&P business 9bn boe reserves valued at US$9/boe, a 25% discount to average global comps 4)Investment valued at book value
Base Case Rs1,118	15.4x Base Case F12e EPS	Assumes: 1) Refining margins of US$9/bbl for F2012; 2) Petrochemical F2012 netback of US$448/tonne and 3) E&P business valued at US$7/boe. 4)Investments valued at 30% discount to book value
Bear Case Rs614	11.4x Bear Case F12e EPS	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.

Bear to Bull Case: E&P to Drive Growth



Source: FactSet, Morgan Stanley Research

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.

Key Value Drivers

- Increased reserve base for Reliance's E&P business. RIL aims to have 10bn boe of reserves and 100 discoveries.
- Reliance's refinery continues posting higher GRMs than peers.

Key Catalysts

- More news on the E&P business.
- 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.

Exhibit 1 (continued)

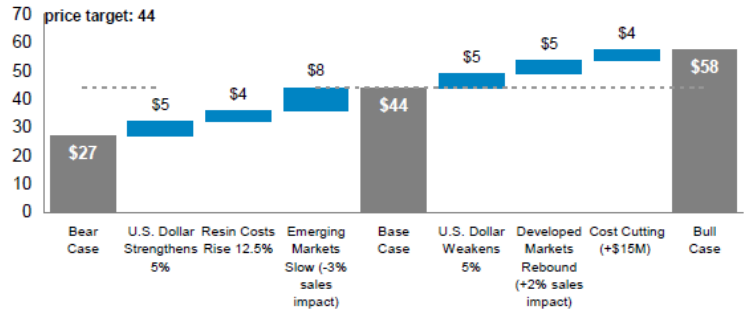
Risk-Reward Snapshot: Tupperware Brands (TUP, $34, Overweight, PT $44)

Risk-Reward View: Strong Growth Potential Not Reflected in Valuation

Source: FactSet, Morgan Stanley Research

Price Target $44		Derived from base case scenario
Bull Case $58	10.0x Bull Case 2010e EV/EBITDA	**Organic sales upside and dollar weakness:** EPS upside driven by 2% organic sales upside as macros improve, the dollar weakens 5%, cost-cutting contributes 5% EPS upside, and Tupperware's EV/EBITDA multiple expands to 10.0 times 2010E EBITDA.
Base Case $44	9.0x Base Case 2010e EV/EBITDA	**Organic sales growth reaccelerates and drives multiple expansion:** 2010 organic sales growth rebounds to 5.9% as macro pressures ease, and 2010E EV/EBITDA multiple expands to 9.0 times, versus an 8 times NTM three-year average.
Bear Case $27	7.0x Bear Case 2010e EV/EBITDA	**Organic sales slow and resin costs increase:** 3% top line downside on an emerging markets slowdown and stalled developed markets results, the dollar strengthens by 5%, resin prices increase 12.5%, and 2010E EV/EBITDA compresses to 7.0 times.

Bear to Bull: FX Key Driver with 86% of Revenue Outside the US



Source: Morgan Stanley Research

Why Overweight?

- **Attractive growth potential:** We forecast Tupperware's high exposure to strong growth emerging markets will drive 5.4% five-year organic sales growth, above 3.6% growth for the remainder of our SMID cap household products coverage. Our 9% five-year operating profit CAGR forecast is also above the 5% CAGR we believe the market has priced into valuation.
- **Near-Term EPS Upside:** We expect EPS upside versus consensus due to rebounding revenue growth trends on easier comparisons, margin upside potential with declining resin costs and a recent pullback in promotional activity, as well as conservative company guidance. Currency risk is a wildcard given Tupperware's 86% 2008 international revenue exposure.
- **Solid Balance Sheet Should Drive Shareholder Value:** We expect a focus on returning cash to shareholders given a solid balance sheet of 1.3 times net debt/2009E EBITDA and solid 8.5% 2009E free cash flow yield.
- **Valuation Looks Attractive:** We view valuation as compelling on a DCF basis and versus Avon, which has a higher valuation despite similar growth prospects

Where We Differ From Consensus

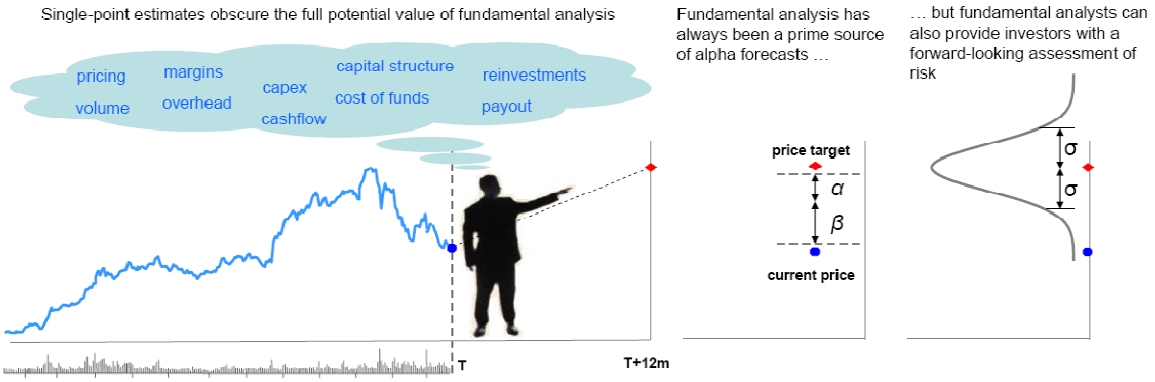
- **Market Underestimates Growth Potential:** We highlight that the market is not recognizing improved growth prospects with a mix shift to higher growth emerging markets and improving developed market trends.
- **Near-Term Upside Versus Consensus:** We illustrate that Tupperware is well positioned to continue to beat consensus EPS.

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

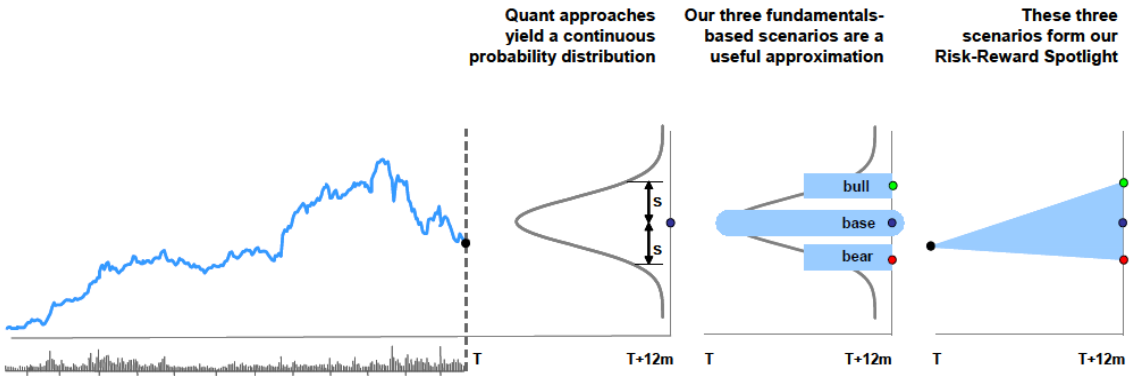
Source: Morgan Stanley.

Exhibit 3 The Fundamental Roots of Risk-Reward Analysis



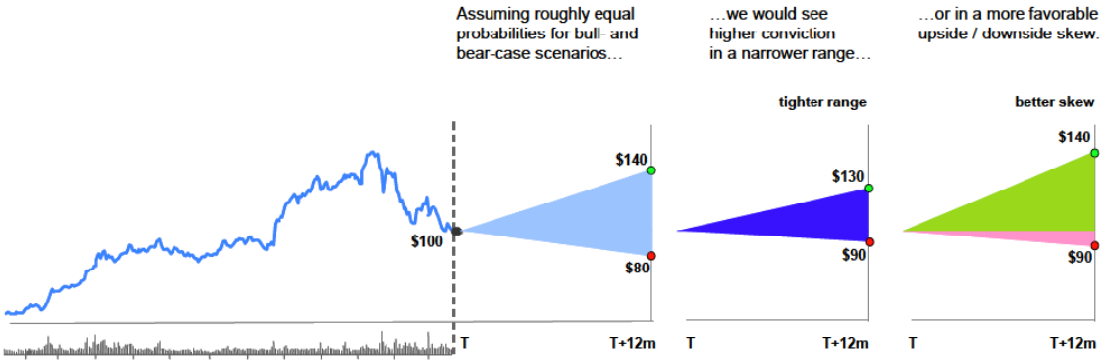
Source: Guy Weyns, Juan-Luis Perez, and Vlad Jenkins, "Risk-Reward Views: Unlocking the Full Potential of Fundamental Analysis," Morgan Stanley Global Research, December 17, 2007, p. 2.

Exhibit 4 Risk-Reward Scenarios Complement Quantitative Views of Risk



Source: 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. 5.

Exhibit 5 Conviction and the Risk-Reward Framework



Source: 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. 9.

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

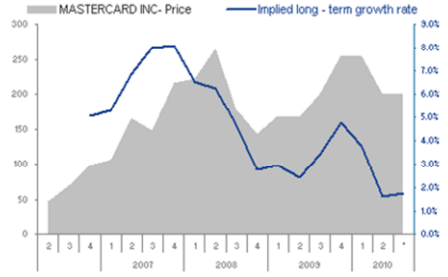
What's in the Price | Long-Term Growth Analyzer

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

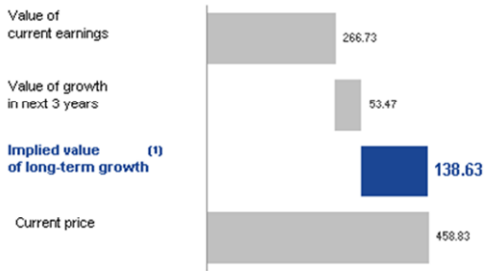
This analyzer helps you understand the assumptions that the market is pricing into a stock – both today and on a historical basis – by calculating the long-term earnings growth rate implied by the current price, given near-term consensus estimates.

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).

The market's current view of long-term growth (+1.8%) is lower than over the past 4 years (+5.2%)



The current price implies that the market is attributing 30.0% of the current value to growth post-2012



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.

$$\text{Value of Current Earnings} = \frac{EPS(0)}{Ke}$$

- *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.

$$\text{Value of Growth in the Explicit Period} = \frac{EPS(3)}{Ke} \times \frac{1}{(1+Ke)^3} + \frac{DPS(1)}{(1+Ke)} + \frac{DPS(2)}{(1+Ke)^2} + \frac{DPS(3)}{(1+Ke)^3} - \frac{EPS(0)}{Ke}$$

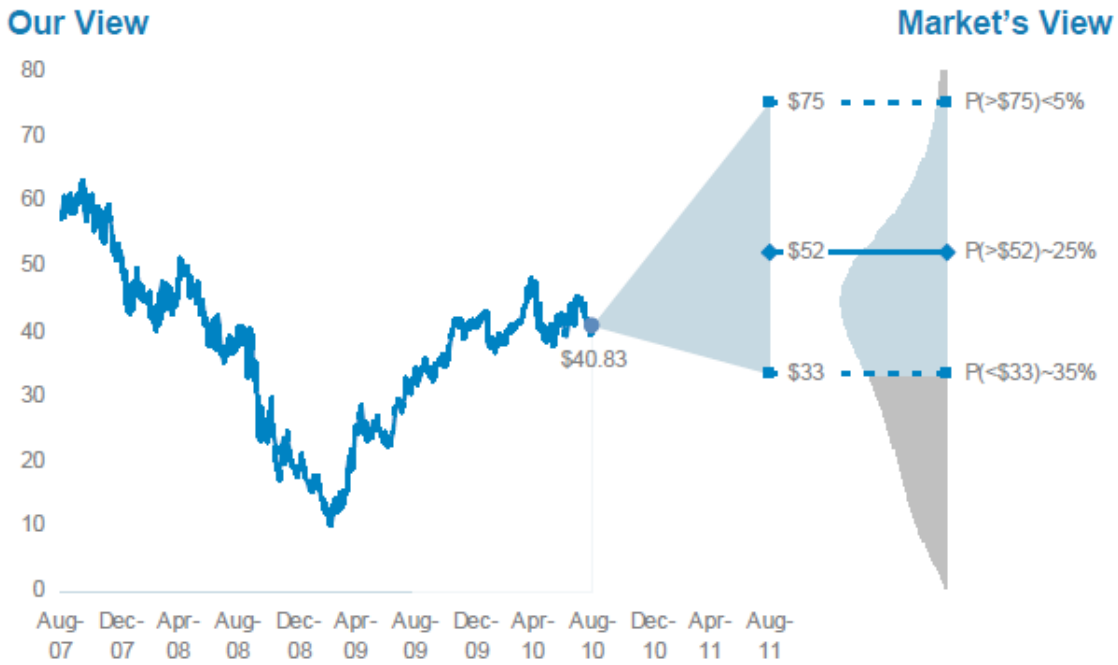
- *Implied value of long-term growth*: This value is simply the current price minus the value of current earnings minus the value of growth in the explicit period.

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.

This means the market assigns less than a 5% chance the stock is above your Bull case in one year…

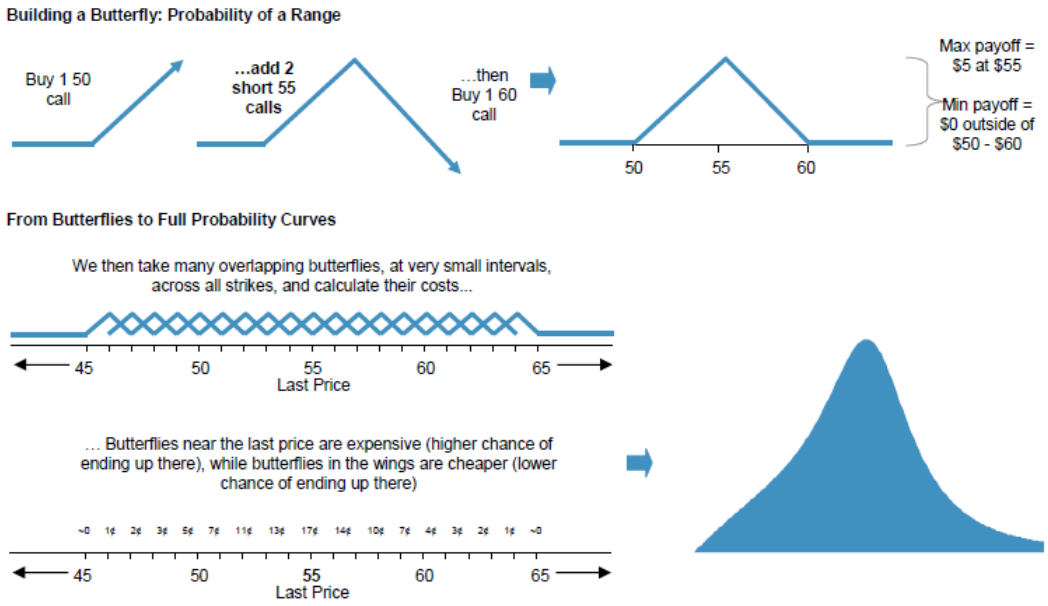
… and a 25% chance the stock is above your Base case in one year…

… and a 35% chance the stock is below your Bear case in one year

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

[1] 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.

[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.

[3] 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. 2.

[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.