May 2, 2016

Global Quantitative Research

Putting Gender Diversity to Work: Better Fundamentals, Less Volatility

MORGAN STANLEY & CO. LLC

Adam S. Parker, Ph.D.
Adam.Parker@morganstanley.com +1 212 761-1755

Lin Lin
Lin.Lin@morganstanley.com +1 212 761-1821

Charles Clavel
Charles.Clavel@morganstanley.com +1 212 761-6758

Chandrama Naha
Chandrama.Naha@morganstanley.com +1 212 761-5852

Eva T Zlotnicka
Eva.Zlotnicka@morganstanley.com +1 212 761-4075

MORGAN STANLEY & CO. INTERNATIONAL PLC+

Jessica Alsford, CFA
Jessica.Alsford@morganstanley.com +44 20 7425-8985

We are launching a gender diversity composite today that includes indicators of women representation, presence in key positions, pay parity and programs/policies promoting work/life balance and diversity. Companies that screen well have lower volatility and higher ROE than those that screen poorly.

*This is the second report in a series on gender diversity among global companies. The first, "**Sustainable and Responsible: A Framework for Gender Diversity in the Workplace**", March 31st, 2016, provided some high level thoughts and descriptive statistics.*

Today, we introduce a comprehensive quantitative framework to assess ~1,600 developed market companies on five themes related to gender diversity: 1) **Representation**: women representation at the employee, manager, executive and director levels, 2) **Empowerment:** presence of women in key C-suite positions and board committees, 3) **Equality in Pay**: our estimation of the gender pay gap at the executive and director level (after controlling for the region, industry, size, and recent 12-month profitability and stock performance of the company, the age and title of the executive/director and the year compensation was awarded) , 4) **Diversity Policies**: policies to promote diversity on the board and equal opportunity, and 5) **Work/Life Balance Programs**: programs facilitating work/life balance for women including flexible working schemes, day care services, and maternity leave benefits.

Adjusting for the cross sectional correlations between the five themes, accounting for the problem of limited data coverage, and then overlaying our qualitative assessment of the relative importance of the factors, we developed a systematic framework to rank the global public companies in our database.

Main conclusions:

1) High gender diversity companies have delivered slightly higher ROE, have lower accruals and lower ROE volatility compared with their low diversity or sector peers. In essence, companies that screen better for gender diversity metrics are higher quality companies using our other standard financial metrics. This is generally true except in Japan, where there just aren't enough companies with any senior women to reliably assess the data.

2) High gender diversity companies have moderately outperformed their low diversity and sector peers on average in the past five years. While it is always hard to ascribe causality, we observe better performance over time for stocks that screen better on our diversity ranking framework, based on a large basket of stocks.

Morgan Stanley does and seeks to do business with companies covered in Morgan Stanley Research. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of Morgan Stanley Research. Investors should consider Morgan Stanley Research as only a single factor in making their investment decision.

For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report.

+ = Analysts employed by non-U.S. affiliates are not registered with FINRA, may not be associated persons of the member and may not be subject to NASD/NYSE restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

3) The high gender diversity stocks within the top quintile of our stock selection model have delivered a much better information ratio than the rest of the top quintile, as those stocks have exhibited lower performance volatility and a lower probability of experiencing a major drawdown, with equal returns. In essence, the diversity framework appears to be accretive to our current stock ranking model, in that the final results provide similar alpha but with lower volatility.

4) Gender pay gaps for directors and executives have been smaller in North America than in Europe or Asia-Pacific ex. Japan over the last 10 years. Japan doesn't have enough women executives and directors for us to make a reliable assessment of the pay gap. Globally, the pay gap is the highest in utilities and materials, and nonexistent in staples. In Europe, we observed an increase in women representation on boards, but not at the executive, manager or employee level. Globally, technology has the least women representation on boards, whereas traditional defensives typically have better representation.

5) We provide lists of stocks that screen well/poorly on gender diversity metrics and with favorable/unfavorable stock selection model rankings (**Exhibit 35**) and (**Exhibit 36**). The framework is designed to compare companies vs. their regional sector peers on gender diversity indicators to avoid various regional and sector biases.

Ultimately, it is our hope that we can more overtly incorporate diversity and other Social and Responsible behaviors into our investment discipline. We believe that today's work on gender diversity substantially advances the debate. Similar alpha with lower volatility, higher profitability, and lower accruals, among other results, are substantial and important empirical assessments that support what we already know - more diverse corporate environments result in superior decision making.

Introduction: Measuring Gender Diversity

The theme of gender diversity has become more prominent in the investment management industry in recent years, as buy-side firms are starting to include it in their investment process and some of them even offer gender diversity ETFs. As the amount of disclosure by companies on gender diversity has accelerated over the last ten years, and as more data sources have become available, quantitative analysis on this subject has started to become more fruitful. **In today's work, we are attempting to make material contributions in three areas:**

1) Quantify the concept of gender diversity

2) Measure its impact on fundamental performance and stock returns

3) Help formulate investment strategies that best exploit the information embedded in these data.

This note describes the data and methodology behind our global gender diversity framework and analyzes the performance of the framework.

Gender diversity is an abstract concept without a universal definition. In this section, we introduce the data and measures we employ to measure the overall gender diversity of a company. We have seen some analysis focused on one or two metrics of gender diversity, mostly for the top ranks of employees, but we wanted to be more comprehensive. As such, we developed a quantitative framework that looks at all levels and ranks in the workplace .

In our Sustainable + Responsible Investment team's introductory note on the topic (**Sustainable and Responsible: A Framework for Gender Diversity in the Workplace**), the team discussed evidence and incentives for investors to consider a company's gender diversity in their investment decisions from difference perspectives - macroeconomic, fundamental and quantitative.

Based on further discussions with our Sustainable + Responsible Investment team and our review of the academic literature on the benefits of gender diversity, we identify **five key elements** that are indicative of the degree of gender diversity within a given company. The first three measure the equality of opportunities and compensation.

1. **Representation: women representation in the work force at all levels/ranks**, in terms of percentage of employees, managers, executives and directors
2. **Empowerment: presence of women at key executive and director positions.** Do women occupy C-suite executive positions? Are they present on key board committees ? If so, do they chair those key committees?
3. **Pay parity: gender pay gap at the executive and board member levels.** Do female executives and board members receive the same compensation as their male counterparts in similar positions within comparable companies?
4. **Diversity Policies: existence of diversity oriented policies** that shape the company's internal organization and attitude towards genders
5. **Work/Life Balance Programs: Installment of accommodating programs** that help women maintain a reasonable work/life balance

Data Sources

All the indicators pertaining to each of the five key elements above and our analysis are based on two data sources provided by Thomson Reuters - the Asset4 database and the Thomson Reuters Business Intelligence

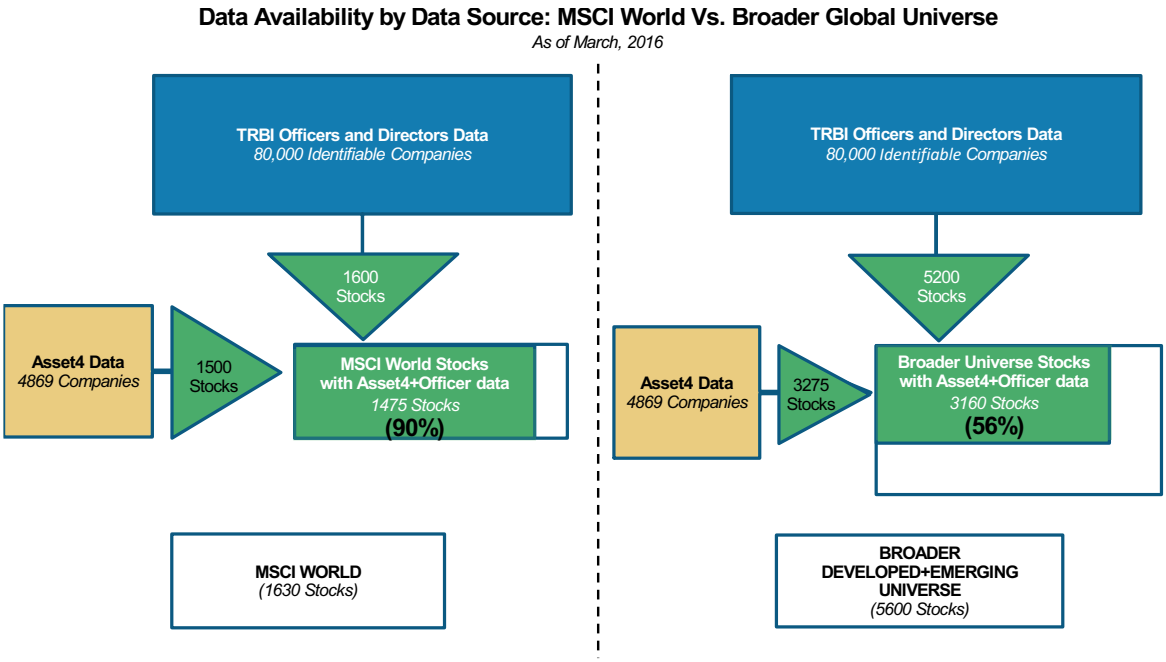
Officers and Directors (TRBI) database.

The **Asset4** ESG database provides declarative data on various environmental, social and corporate governance themes on an annual basis since 2003, with a 12 to 18-month lag. This data source contains various indicators pertaining to women representation in the work force, in management, and at the executive and director levels, and to the presence of policies and accommodating programs that encourage gender diversity.

In addition, we used the **Thomson Reuters Business Intelligence Officers and Directors** database, which provides, for the members of the board and of the executive team of a company, some descriptive elements (including gender, age, educational attainment), their title and function (in particular, committee membership or chairmanship) and compensation data (total and broken down by category, i.e., salary, bonus, stock based compensation...). The data quality is comparable between TRBI and Asset4 as the data on women representation on boards, the common indicator in the two databases, are very similar.

Unlike financial statement data, the disclosure of many data items related to gender diversity (like the percentage of women managers) is mostly voluntary (as of now) and the amount of disclosure can vary considerably across regions. The costs associated with collecting and gathering ESG data may also deter some smaller companies from disclosing such information. Besides, data availability and quality in the early years is not sufficient to enable a robust quantitative analysis. The lack of reliable identifiers to match the same company across the three data sets (the Asset4 data, the Officers & Directors data and our global stock data base) also reduces the stock population available for analysis**. Exhibit 1 shows that we were able to match 90% of MSCI World stocks, but only 56% of our broader model universe. Given those data limitations,our analysis is based on the constituents of the MSCI World index over the last five years.**

Exhibit 1: Our sources of gender diversity data enable us to cover 90% of MSCI World stocks, but only 56% of our broader model universe



Source: FactSet, Asset4, Morgan Stanley Research

Women Representation in the Workplace

When we measure the equality of opportunities within a company, we are fully aware that we could capture an outcome that has been shaped by forces outside the company's control. For example, given that the percentage of women majoring in computer science is low, one would expect a low percentage of women coders in software companies, and as a result, a low percentage of female executives or directors within those companies. In addition, the presence of women in the work force varies across countries and regions due to a variety of social and cultural factors. In order to neutralize such biases, **we compare companies to their regional**

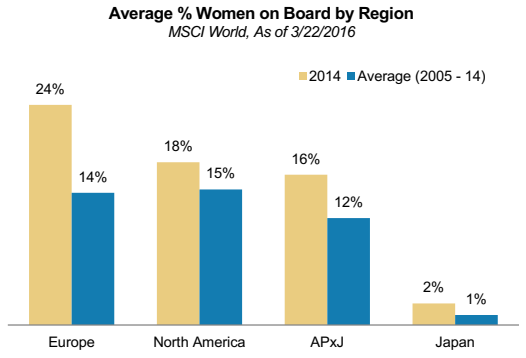
sector peers in terms of gender diversity metrics.

The percentage of women on the board of directors is the most widely studied and used metric in the subject of gender diversity because of its long history of satisfactory data coverage. It is also a key variable in the stock selection process for the gender diversity ETFs that are currently available. We looked into this metric and had a few interesting observations.

The representation of women on the board of directors varies by region and over time. **Europe is now the leader in terms of women representation on the board, with a significant improvement over the past six years. Japan, on the other hand, appears to be the laggard**, with women directors on average only accounting for 2% of board members (**Exhibit 2**). **Exhibit3** gives us a closer look at the data by showing the range by region. In 2014, European companies not only had the highest average percentage of women on board, they also had the highest 90th and 10th percentiles. In stark contrast, half of the Japanese companies had 0% women directors, and very few companies had more than 10% of female directors.

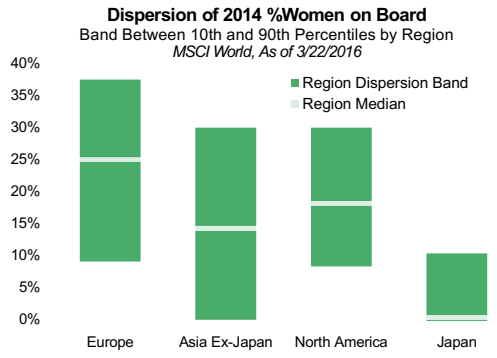
The geographical disparities in the representation of women on the board of directors are directionally consistent with the variations in regulators' efforts in different countries/regions to promote gender diversity in the work place. In Europe, a number of countries have enacted laws over the past few years with the aim of improving women representation on the board, either through explicit quotas (Norway, France, Belgium) or through more flexible "comply or explain" systems (Sweden, Finland, UK), which helps explain the improvement in recent years.

Exhibit 2: Europe is the leader on gender diversity for corporate boards...



Source: FactSet, ASSET4 and Morgan Stanley Research

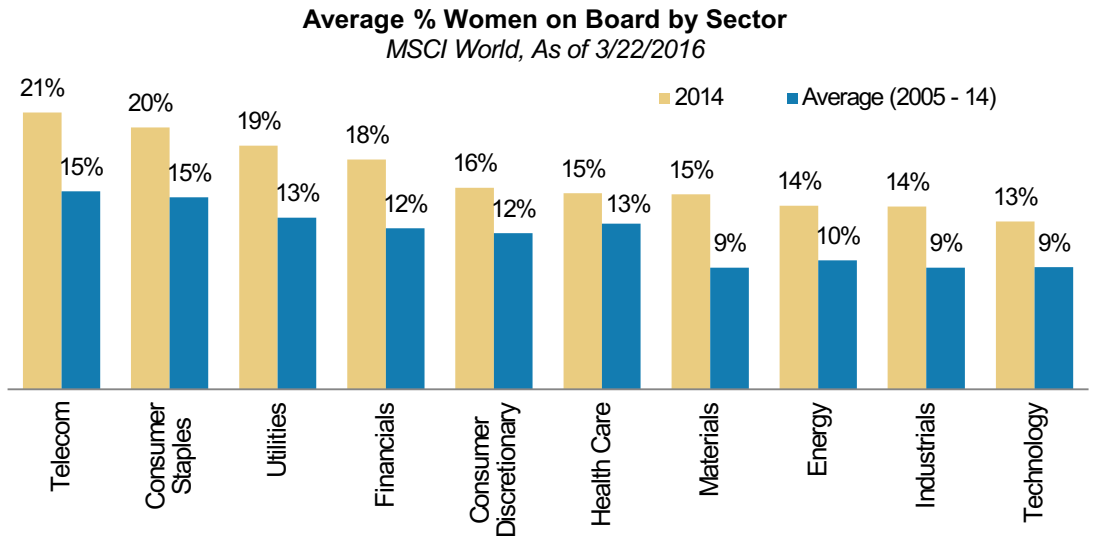
Exhibit 3: ... while Japan appears to be the laggard



Source: FactSet, ASSET4 and Morgan Stanley Research

We also found disparities in the percentage of women directors across sectors. Some results are in line with expectations, but some are quite surprising. **Technology has the lowest share of women directors, while defensive sectors (telecom, consumer staples and utilities) have the highest percentages (Exhibit 4).**

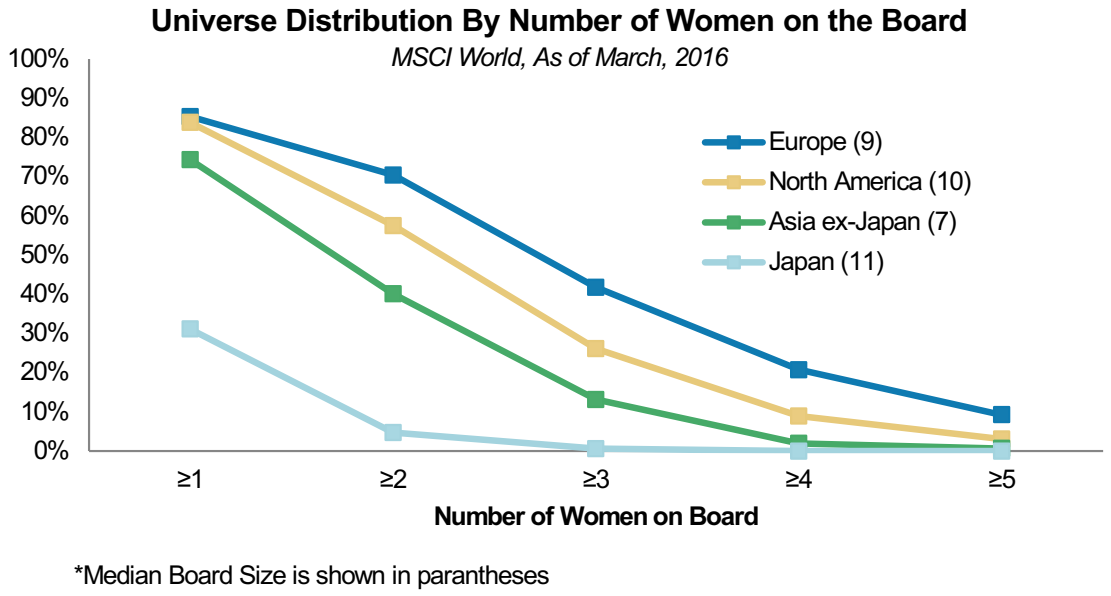
Exhibit 4: Technology has the lowest share of women directors while defensive sectors (telecom, consumer staples and utilities) have the highest shares



Source: FactSet, ASSET4, TRBI and Morgan Stanley Research

Outside Japan, the presence of women on the board of directors is not merely symbolic, as many companies have more than one woman on their boards. **Exhibit 5** shows the regional distribution of our universe of companies by number of women board members as of the latest available snapshot of data. **~70% of European companies and ~60% of North American companies have at least two women on their board.**

Exhibit 5: ~70% of European companies and ~60% of North American companies have at least two women on their board of directors

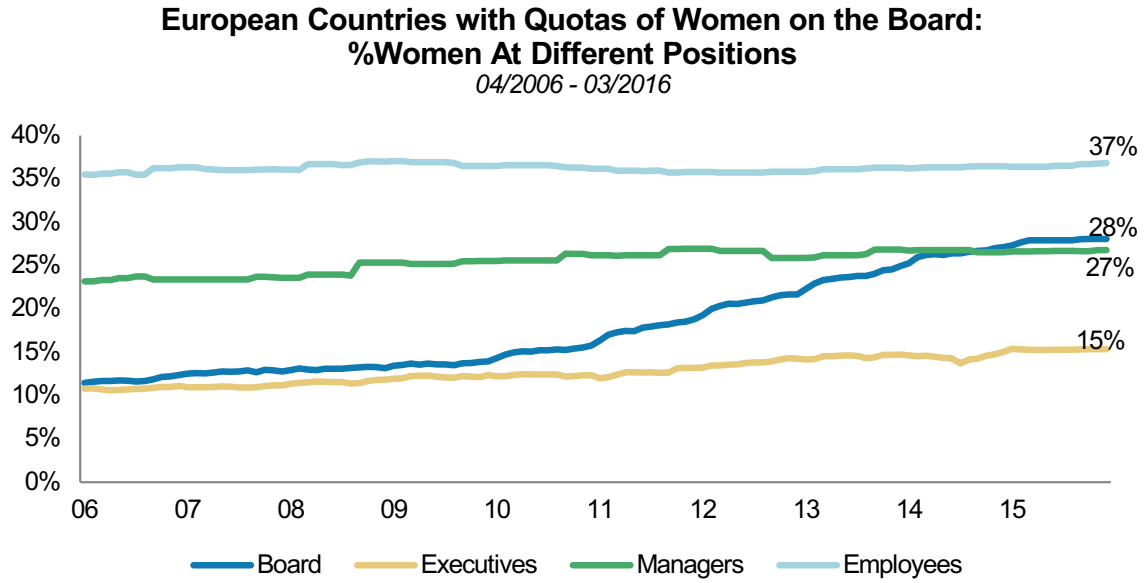


Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Of course, the percentage of women on the board of directors doesn't provide the full picture of women representation in the company. For example, a high percentage of women on the board may hide a disparity between the number of internal (i.e., selected from the pool of women executives) vs. external board members. Actually, in the European countries that mandate quotas for female representation on the board, there are indications that the quotas may be filled primarily with external candidates. **Exhibit 6** shows the average percentage of women at each of the four levels (employee, manager, executive and board member) in eight

European countries (France, Belgium, Norway, Sweden, Finland, Germany, Spain and UK) that have passed legislation prescribing "hard" or "soft" quotas of women on the board of directors in the past few years. While the average percentage of women on the board has increased, the representation of women at the other levels has not changed materially. **Therefore, our gender diversity model also evaluates women representation outside the boardroom, more specifically at the employee, manager and executive level.**

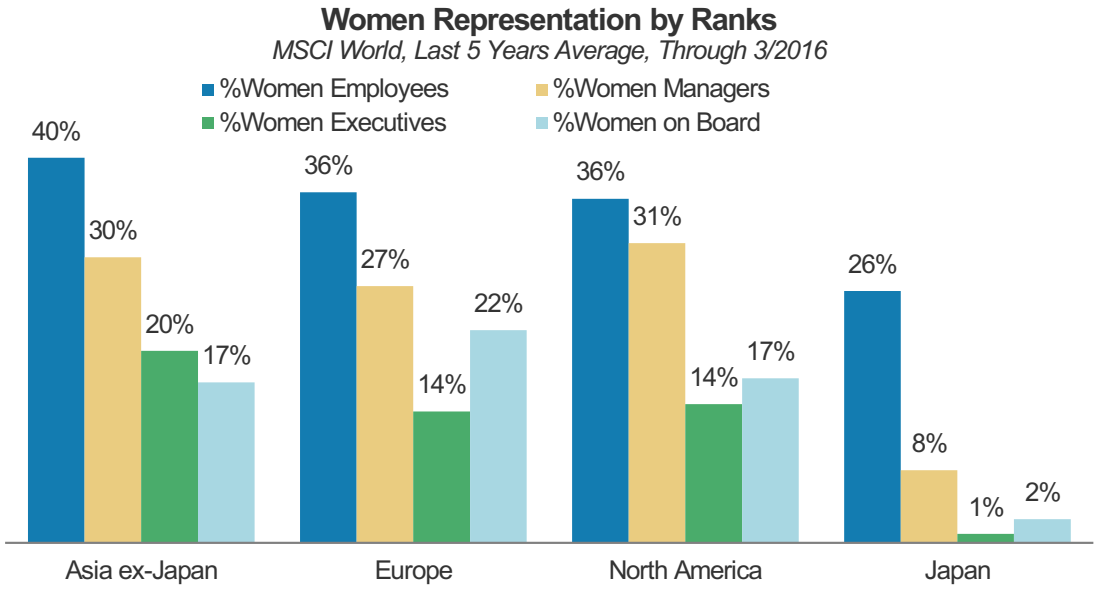
Exhibit 6: In European countries that legislated quotas of women on the board of directors, the increase in women representation at the board level was not accompanied by increases at other levels



Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Every year, in annual reports (or 10-Ks in the US), companies disclose information on their leadership team members (which we refer to as executives in this note) including their name, gender, title(s), educational background, compensation. **We use these data (taken from Thomson Reuters' Officers and Directors database) to calculate the percentage of women executives. Our analysis also includes the percentages of women employees and women managers (from Asset4 data), which provide indications on the broader representation of women in the work force**. Exhibit 7 summarizes the average women representation by region at each level. **The difference between the percentages of women employees and women managers is the smallest in North America and the largest in Japan. While Japanese companies have a lower percentage of women employees than in other regions (26% vs. above 35%), the share of women managers is even lower (8% vs. above 25% in other regions), and Japanese women have very little representation in executive teams and board rooms.**

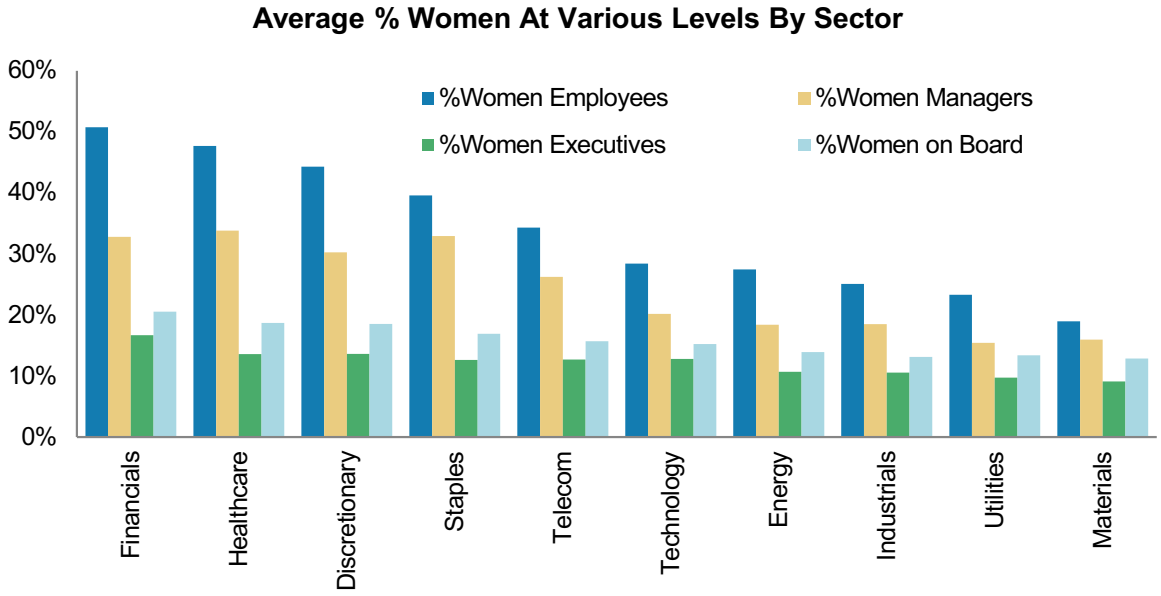
Exhibit 7: Our gender diversity model includes measures of women representation at the employee, manager, executive and board member levels



Source: FactSet, Assset4, TRBI, Morgan Stanley Research

The distribution by sector, as shown in **Exhibit 8**, is generally consistent with intuition. **The average percentages of female employees and managers are the highest in financials, healthcare and consumer oriented sectors, while their presence in traditional industrial sectors is less common.** Note that the average percentages of women managers by sector are broadly consistent with those of women employees. **The biggest difference between the percentages of women employees and women managers can be found in the financial sector.**

Exhibit 8: As expected, women are the most represented in financials, healthcare and consumer discretionary , and the least represented in the traditional industrial sectors

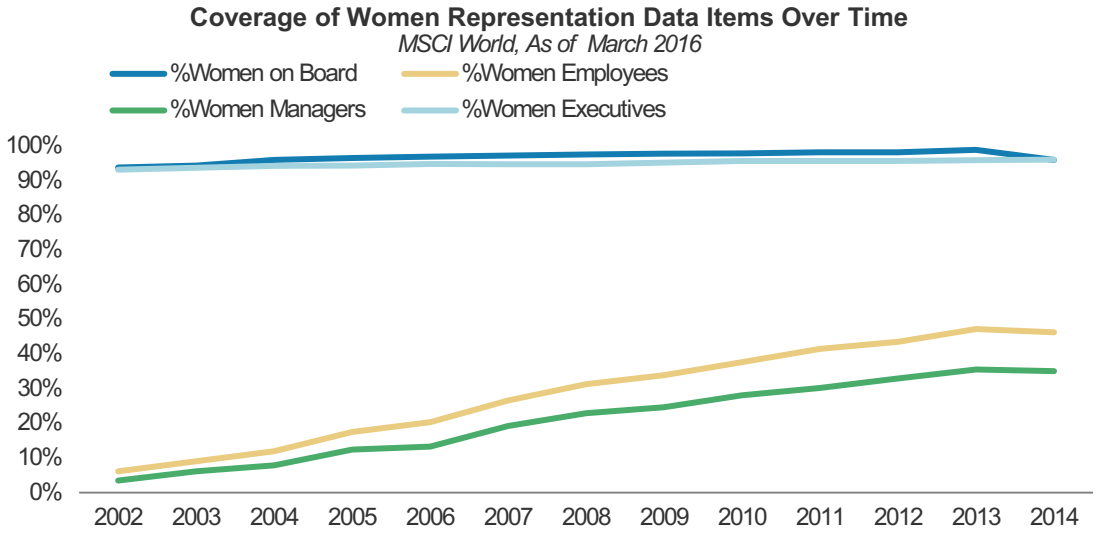


Source: FactSet, Asset4, TRBI, Morgan Stanley Research

The data coverage (percentage of non missing values) across the whole MSCI World universe for the women representation variables by fiscal year is shown in **Exhibit 9**. Note that there is a ~ 1 year lag between the end of a fiscal year and the moment we deem the data to be available. **Data coverage for the percentages of**

women employees and managers is much lower than for the percentages of women board members or executives. Nonetheless, the former are still valuable additions to our gender diversity model. We believe they provide incremental information as both metrics exhibit low correlations with the percentages of women on board, as we will show later in the note.

Exhibit 9: Data coverage for the percentages of women employees and women directors is much lower than for the percentages of women on board and executives

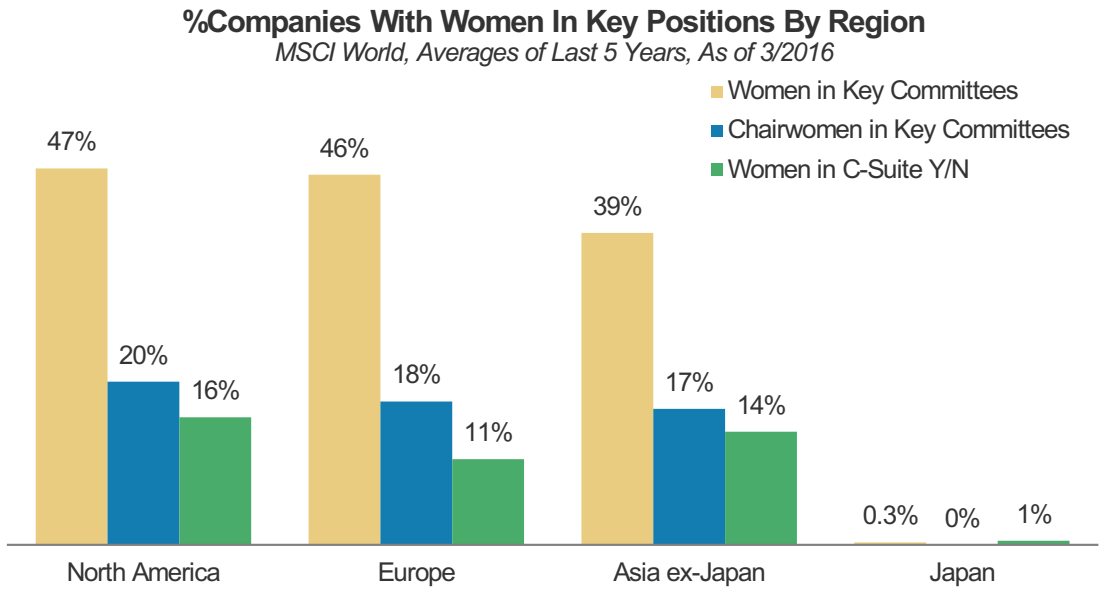


Source: FactSet, ASSET4, TRBI and Morgan Stanley Research

Women Representation in Key Executive or Board Positions

While the presence of women at various levels of a company is a strong indicator of gender diversity, indicators measuring the quality of that representation, i.e., whether women occupy key positions within the company, provide incremental information. The inclusion of such variables helps guard against tokenism, whereby women are represented but confined to secondary roles. The data we acquired can help measure the quality of women representation within the executive team and the board of directors. We created binary indicators for the presence of a woman in key C-suite positions (CEO, CFO, COO, Chairperson) and similar binary indicators for the presence in and chairmanship of key board committees (audit, nominating, governance and compensation committees). We also calculated, for each company, the percentage of women across the key committees. Outside of **Japan, 11-16% of companies have at least one woman in a major C-suite position, and ~20% of companies have at least one woman chair of a key board committee (Exhibit 10).** In Japan, women are almost unrepresented in key board or executive positions. In addition, **almost half of companies in North America and Europe have at least one woman in at least one of the four key committees.**

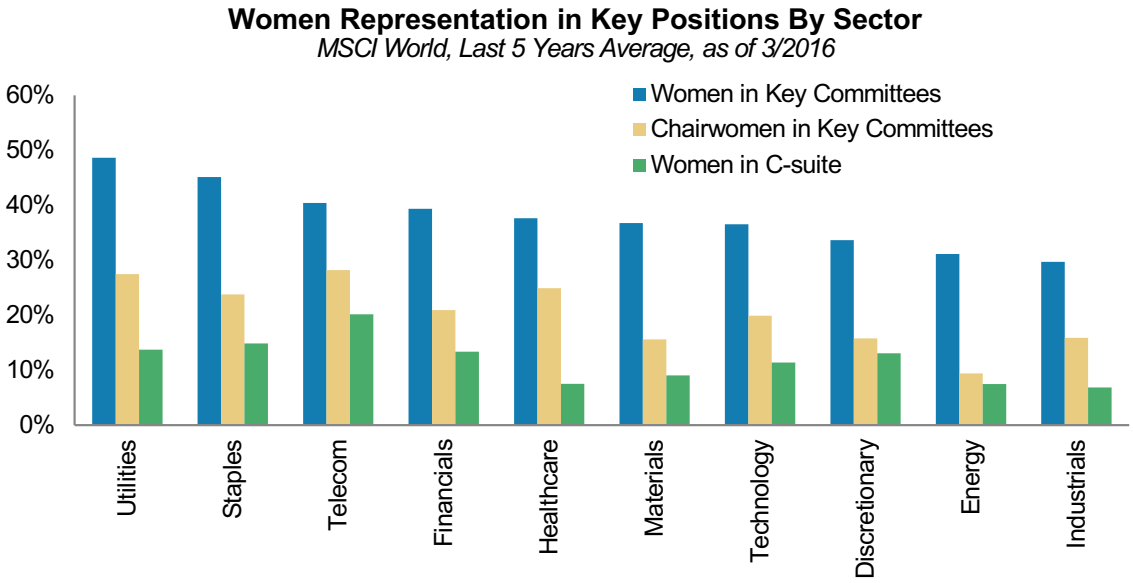
Exhibit 10: Outside Japan, 11-16% of companies have at least one woman in a major C-suite position and ~20% have at least one woman chair of a key committee



Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Telecom, staples and utilities are the sectors with the highest presence of women in key C-suite positions globally (Exhibit 11). Those sectors also have the highest levels of women representation in key committees. By contrast, the lowest levels of women representation in key positions can be found in energy and industrials.

Exhibit 11: Women representation in key executive/board positions is the highest in telecom, staples and utilities and the lowest in energy and industrials



Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Gender Pay Parity at the Executive and Director Levels

A number of academic studies reveal the existence of a gender pay gap,which can be defined as women receiving a lower compensation than their male counterparts for a similar position in a comparable company.

The existence and magnitude of the gender pay gap is obviously an important issue to consider when assessing companies with regard to gender diversity. Yet, existing gender diversity indices and investment products rely primarily on variables that are indicative of women representation at the executive and director levels and the presence of women in key executive/director positions, and to our knowledge, do not include metrics measuring the gender pay gap in a given company. **The main difficulty when trying to estimate the gender pay gap is to identify the proper set of control variables, in order to determine what constitutes a comparable position and a comparable company.**

The academic literature primarily focuses on the gender pay gap at the executive level (with the exception of a recent paper published by Glassdoor, which has the data to analyze the pay gap at the employee level). Our review of academic studies suggests a number of control variables. First, executive compensation varies across geographies and industries (so we include region and GICS industry group dummy variables in our analysis). Pay gap studies also typically include dummy variables for the vintage year, to control for inflation and the fact that overall compensation levels can vary materially from year to year. For example, executive compensation was at historical highs at the height of the tech bubble (especially in the technology sector) and low in the aftermath of the 2008 financial crisis. Other control variables include dummy variables for some key executives positions (since, for example, the CEOs and CFOs usually receive much higher compensation than lower ranked executives), the age of the executive (as a proxy for experience), some indicator of the size of the company (typically the log of trailing 12-month sales) and some indicators of the company's recent performance (typically trailing 12-month return on assets). Given that a large fraction of executive compensation is stock (or stock options) based, we also include trailing 12-month price momentum as a control variable, even if it is less frequently present in academic studies.

The Thomson Reuters Business Knowledge (TRKD) database provides annual compensation data for 2,060 companies in the developed markets since 1998. In this report, we use total compensation (which includes salary, bonus and restricted stock awards) over a given fiscal year to measure the pay level of executives and directors. This of course may be an incomplete assessment of total compensation, given that many executives receive dividends on the unvested portion of their deferred compensation like restricted stock units, as an example, but we assume that this part of total compensation applies consistently across men and women. **Given that executives and non executive directors receive very different levels of compensation on average, we created separate models for these two categories**. Our analysis excludes instances when an executive received a token ($1) salary or total compensation in a given year. We use the control variables mentioned above in our pay gap model, along with, in the executive model, a dummy variable for whether the executive is a director.

To measure the gender pay gap at the executive level for a given company, we first estimated the compensation level for every executive of the companies that are part of the MSCI World index, regardless of their gender, by **running rolling 2-year pooled regressions of the log of total compensation vs. the set of variables mentioned above**. The average regression residuals for female executives in a given company indicate the pay gap relative to an average executive of the same profile, but doesn't take into account company specific effects (some companies could systematically under or over pay their executives). **To remove company specific effects, we calculate the difference in average residuals between female executives and male executives within a given company. We applied the same methodology and computed the gender pay gap for non executive directors. The final indicator is the average of the two pay gap measures.**

Japan is excluded form this analysis due to its low representation of female executives (<1%). Also, note that the amount of compensation data on European executives is lower than in North America.

Exhibit 12 provides an assessment of the magnitude and significance of the gender pay gap by region on average over the past 10 years. The analysis below uses the same set of variables as in the construction of our pay gap variable (minus the regional dummy indicators) and one pooled regression. **The coefficient associated with the female dummy variable is negative - and statistically significant in North America and Europe - which indicates that on average, female executives have been underpaid relative to their male counterparts after accounting for our set of control variables.** The magnitude of the average gender pay gap at the executive level, calculated as 1- exp(female dummy variable coefficient), is 3% in North America, 25% in Europe, and 10% in developed Asia Pacific ex. Japan.

Executive Pay Summary Conclusions:

1. **CFOs in Europe - unlike in North America and APxJ - have not been paid materially better than other executives**
2. **Chairperson compensation in North America has been materially better than that of other executives, unlike in Europe or APxJ**
3. **Age doesn't seem to matter with regard to executive compensation**
4. **Recent (12-month) stock performance is an explanatory factor of total executive compensation in North America, but not in the other two regions. This observation can be explained by the substantial stock/option based component in the compensation package of many North American executives**
5. **The percentage of independent directors on the board is negatively related to executive compensation levels across regions**

Exhibit 12: We observe a statistically significant gender pay gap at the executive level in North America and Europe over the past 10 years

Regression Models
Explaining Total Compensation for Executives
Dependent Variable: Ln(Total Compensation), 2006 - 2015

Variable	North America	Europe	APxJ
Female (Dummy)	-0.03*	-0.29***	-0.11
CEO (Dummy)	0.53***	0.50***	1.31***
President (Dummy)	0.19***	0.09*	0.16
CFO (Dummy)	0.05***	0.02	0.34***
COO (Dummy)	0.32***	-0.09	0.61***
Chairperson (Dummy)	0.30***	-0.05	-0.11
Other Director (Dummy)	0.32***	0.25***	-0.19***
Age	0.00	0.00	0.00
Ln(Sales)	0.30***	0.25***	0.23***
ROA	0.16***	1.11***	0.17
12-Month Trailing Return	0.07***	-0.01	0.04
Percent of Independent Directors	-0.39***	-0.37***	-0.15
Intercept	11.64***	11.34***	11.08***
R Squared	0.47	0.20	0.32
Number of Observations Used	24,275	7,042	2,668

* Significant at 10%, ** significant at 5% and *** significant at 1%
Note: Dummy variables for year and 24 GICS level 2 classifications are included in all regression models.

Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Exhibit 13 shows a similar analysis of the gender pay gap by region for non executive directors. **Over the past 10 years, female outside directors have also been underpaid relative to their male counterparts, after accounting for the set of control variables. The gender pay gap for outside directors is higher than that for executives: 16% in North America, 33% in Europe and 24% in Asia Pacific ex. Japan.**

Exhibit 13: The gender pay gap has been even higher for non executive directors

Regression Models
Explaining Total Compensation for Non-Executive Directors
Dependent Variable: Ln(Total Compensation), 2006 - 2015

Variable	North America	Europe	APxJ
Female (Dummy)	-0.18***	-0.33***	-0.28**
Chairperson (Dummy)	1.23***	1.51***	0.99***
Vice Chairperson (Dummy)	1.01***	0.52***	0.70***
Age	0.00	-0.01***	-0.04***
Ln(Sales)	0.19***	0.25***	0.12***
ROA	-0.86***	1.34***	1.28**
12-Month Trailing Return	0.11	-0.06**	-0.18
Percent of Independent Directors	-2.79***	0.04	-1.35***
Intercept	12.88***	9.34***	12.50***
R Squared	0.71	0.23	0.28
Number of Observations Used	2,837	18,994	1,404

* Significant at 10%, ** significant at 5% and *** significant at 1%
Note: Dummy variables for year and 24 GICS level 2 classifications are included in all regression models.

Source: FactSet, Asset4, TRBI, Morgan Stanley Research

We also ran separate regression analyses by gender on the overall population of executives and directors of MSCI World companies over the past 10 years (**Exhibit 14**).**The compensation discrepancy between the top and the lesser ranked executives and directors is higher for female than male executives and directors. The reward for good performance (measured using return on assets and 12-month trailing stock returns) also seems to be higher for female than male executives and directors.**

Exhibit 14: The compensation discrepancy between the top and the lesser ranked executives and directors is higher for female than male executives and directors

Regression Models
Explaining Total Compensation for Executives/Directors
Dependent Variable: Ln(Total Compensation), 2006 - 2015

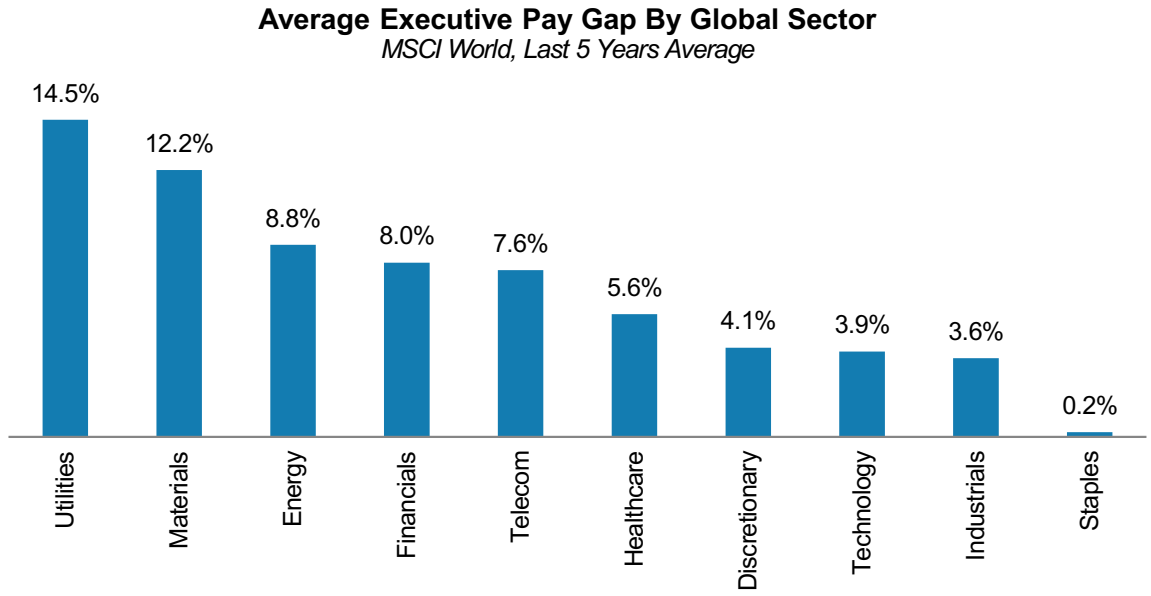
Variable	Male	Female
CEO (Dummy)	1.74***	2.71***
President (Dummy)	0.18***	0.47***
CFO (Dummy)	0.50***	0.61***
COO (Dummy)	0.76***	1.25***
Chairperson (Dummy)	0.53***	0.11
Other Director (Dummy)	-0.63***	-1.40***
Age	-0.02***	-0.01***
Ln(Sales)	0.26***	0.21***
ROA	0.74***	0.88***
12-Month Trailing Return	0.03*	0.09**
Percent of Independent Directors	-0.88***	-0.55***
Intercept	13.42***	34.46***
R Squared	0.59	0.65
Number of Observations Used	51,100	6,225

* Significant at 10%, ** significant at 5% and *** significant at 1%
Note: Dummy variables for year, region, and 24 GICS level 2 classifications are included in the models.

Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Exhibit 15 shows the average executive level gender pay gap by global sector over the last five years. The gender pay gap has been the highest in utilities and materials, and almost nonexistent in staples.

Exhibit 15: The average executive gender pay gap has been the highest in utilities and materials over the last five years



Source: FactSet, Asset4, TRBI, Morgan Stanley Research

In addition to our two gender pay gap variables (one for executives, the other for non executive directors), **we created a more basic measure of gender based pay disparity: a binary indicator for the presence of a woman among the five most compensated executives or directors** (if the company discloses

compensation data on at least 10 executives or directors).

Programs and Policies Promoting Gender Diversity

While we were able to find a number of data items enabling us to assess gender diversity in the board of directors and in the executive team, there are much less data available to assess gender diversity at the employee or middle management level. In the Asset4 database, we found five indicators that are related to overall gender diversity. The variables correspond to binary flags derived from Yes/No answers to the following questions:

Does the company have a policy regarding the diversity of its board?

Does the company have a policy to drive diversity and equal opportunity?

Does the company provide flexible working schemes?

Does the company claim to provide day care services for its employees?

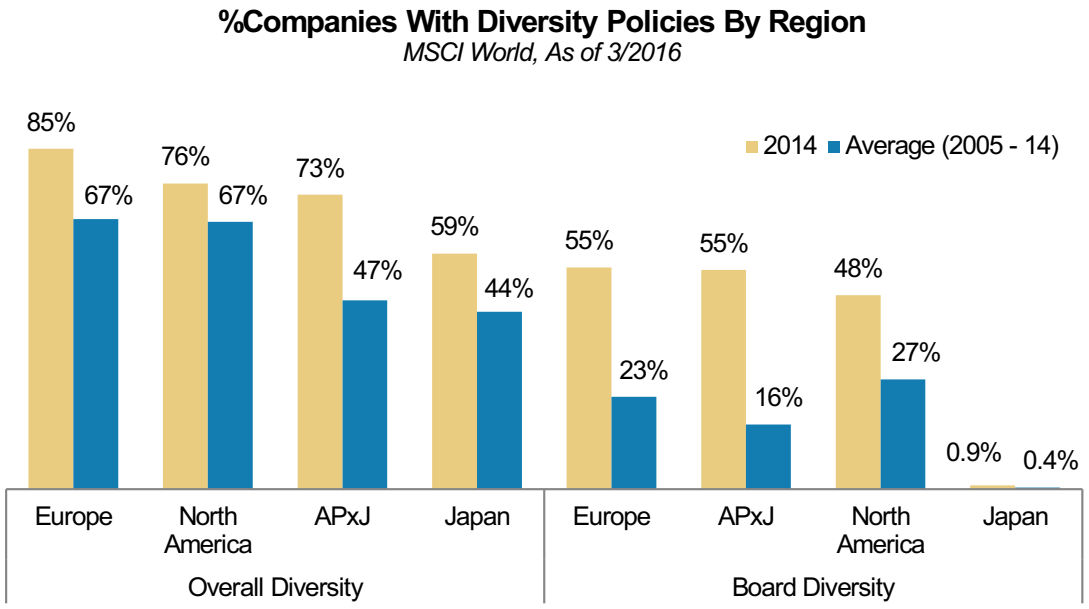
Does the company claim to provide generous maternity leave benefits?

Data availability on the policy and programs questions is very good, even historically. The informational content of the policy variables is probably lower than that of more tangible indicators of gender diversity, like the presence of women in the executive team, because the presence of a diversity policy could be interpreted as a "check the box" item that most companies have or a declaration of intent that is not necessarily followed by tangible manifestations of increased diversity. Nonetheless, the presence of such policies is one of the few indicators on the theme of gender diversity that pertain to the whole population of female workers, and not just the most highly ranked. This item is also important for Japanese companies as other measures are not available due to the lack of female executives.

We examined whether there are regional or sector differences in the percentage of companies with diversity policies.

Exhibit 16 shows, by region, the percentages of companies that have an overall diversity policy and a board diversity policy (for fiscal year 2014 and the average of fiscal years 2005-2014; note that we apply a one year lag between the end of the fiscal year and the moment we consider the data to be available). **The presence of diversity policies has increased materially over the past 10 years with the notable exception of Japan**. Board diversity has not been a meaningful policy objective for Japanese companies. Comparatively, policy differences across global sectors are modest.

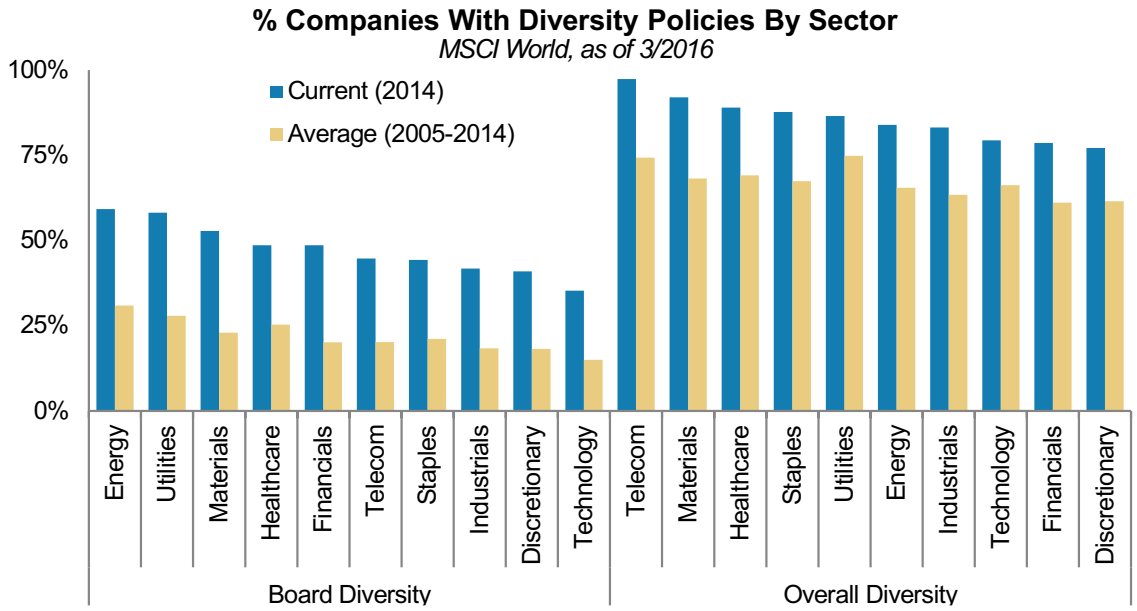
Exhibit 16: Board diversity policies are still less prevalent than overall diversity policies, across regions



Source: FactSet, Asset4, TRBI, Morgan Stanley Research

At the global sector level, the presence of board diversity policies is the highest among energy and utility companies and the lowest in the technology sector (**Exhibit 17**). Telecom and materials are the sectors with the highest percentages of companies with overall diversity policies. Consumer discretionary is a laggard in terms of both types of policies.

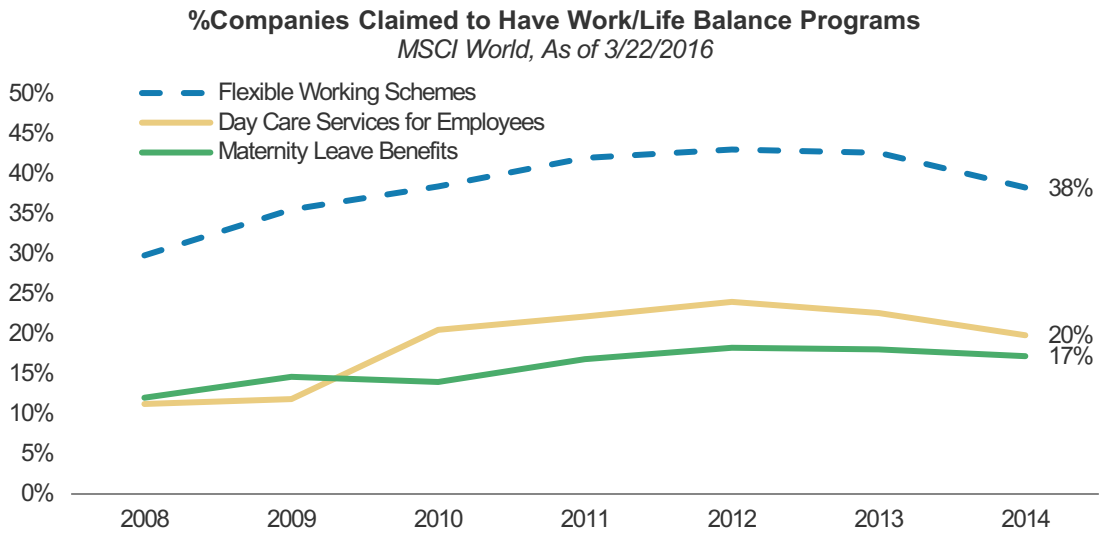
Exhibit 17: Board diversity policies are the most prevalent in energy and utilities, and the least prevalent in technology



Source: FactSet, Asset4, TRBI, Morgan Stanley Research

An important part of the effort to retain experienced female employees is to accommodate their higher demand for work/life balance. As a response to the increased women participation in the work force, more and more companies have been initiating programs that provide more flexibility and/or help in this regard. It appears that companies have made progress in implementing work/life balance programs over the last six years, albeit very slowly (**Exhibit 18**).

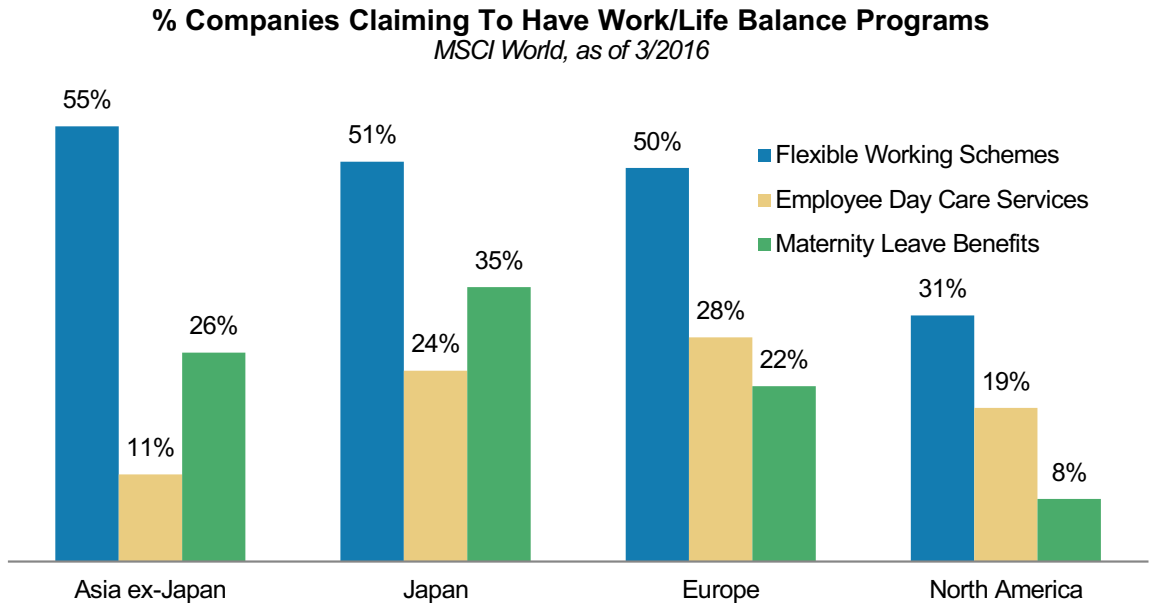
Exhibit 18: Companies have made small progress installing work/life balance programs over the last six years



Source: FactSet, ASSET4, TRBI and Morgan Stanley Research

Exhibit 19 shows that Japan isn't lagging with regard to work/life balance programs for women: more than 30% of Japanese companies provide generous maternity leave benefits. In North America, on the other hand, only ~30% of companies have flexible working schemes and only about 10% of companies provide maternity leave. Disparities across sectors with regard to work/life balance programs are quite modest. We note that 60% of telecom companies have flexible working schemes (20% above the other sectors), and that energy lags in offering maternity leave benefits and day care services.

Exhibit 19: A large percentage of Japanese companies provide work/life balance programs for women



Source: FactSet, Asset4, TRBI, Morgan Stanley Research

The Gender Diversity Model

In the previous section, we identified various indicators under the five gender diversity themes. Each indicator provides some unique information, but might be correlated to various degrees with the other ones. In this section, we analyze the correlations between the various indicators and develop a framework for combining them into a sensible gender diversity model.

Standardization and Correlation Analysis

Before making a model including various gender diversity variables, we need to standardize them so that they become comparable. Given the differences in gender diversity characteristics across regions and sectors **we normalized all the gender diversity factors at the regional sector level**. Our standardization procedure involves several steps (**Exhibit 20**). First, we convert the binary Yes/No indicators into 1/0 variables. Then, in order to account for regional and sector biases, we calculate Z-scores at the regional sector level. Given that the distribution of raw values for most factors remains within reasonable bounds, we apply Z-scores to raw values for most factors, except for the pay gap variable, for which we apply Z-scores to factor ranks (regional sector relative). The Z-scores are then converted into regional tertiles, 3 being the most favorable and 1 being the least favorable. Finally, we proceed with missing values imputation. For variables outside the pay parity theme, we impute a tertile ranking of 2, medium level of gender diversity, to missing values. However, the pay gap between genders can only be measured for companies that have female executives or board members. Therefore, the pay gap variable can be missing for any of three reasons: (1) the indicators for the presence of women executives or board members are missing, (2) the data indicate the presence of women executives or directors but we don't have the necessary compensation data to compute the gender pay gap, (3) the data indicate the absence of women executives or board members. In cases (1) and (2), we impute a tertile ranking of 2 since we don't have enough information to assign a good or poor pay gap ranking. In case (3), we impute a tertile ranking of 1, as we assume that those companies would likely have an unfavorable gender pay gap if they actually had female executives or board members.

Exhibit 20: Summary of our factor standardization procedure

From Raw Data to Gender Diversity Element Scores (1=Low, 3=High)

Element	Indicator	Convert Yes/No Into 1,0	Regional Sector Z-Scores	Regional Tertile Ranking	Missing Values Imputation
Equality in Pay	Women Among Top Earners	X	Raw Values	X	If no woman exec or director then ranking=1 ; Else if missing value then ranking=2
	Women Execs/Directors Pay Parity		Ranks	X	If no woman exec or director then ranking=1 ; Else if missing value then ranking=2
Enpowerment	Women in C-Suite	X	Raw Values	X	If missing value then ranking=2
	Women Chairman in Key Committees	X	Raw Values	X	If missing value then ranking=2
	%Women Key Committee Members		Raw Values	X	If missing value then ranking=2
Representation	%Women on Board		Raw Values	X	If missing value then ranking=2
	%Women Executives		Raw Values	X	If missing value then ranking=2
	%Women Managers		Raw Values	X	If missing value then ranking=2
	%Women Employees		Raw Values	X	If missing value then ranking=2
Programs/Policies	Work/Life Balance Programs		Raw Values	X	If missing value then ranking=2
	Diversity Policies		Raw Values	X	If missing value then ranking=2

Source: Morgan Stanley Research

Exhibit 21 shows the average cross sectional rank correlations between various gender diversity factors. **As expected, the vast majority of correlations are positive, as the factors convey the same broad underlying theme of gender diversity, but the correlations are surprisingly low**. The presence of low correlations between the indicators suggests a low amount of redundancy between the various gender diversity indicators. Note the negative (albeit low magnitude, not statistically significant) correlation between the executive/director pay gap and programs variables. It indicates that directionally, companies that rank favorably (unfavorably) with regard to their accommodating programs for women tend to rank unfavorably (favorably) in terms of gender pay gap at the executive or director level. There are a few high correlations (>0.30) in the matrix, which are consistent with intuition. The percentages of women employees and managers have a high

correlation. The percentages of women on the board and in key board committees are also highly correlated, which argues against the presence of tokenism. The presence of women in the C-suite and of women among top earners are also naturally correlated, and so are the presence of diversity policies and of accommodating programs for women.

Exhibit 21: Most of the cross correlations between gender diversity factors have been low on average over the past five years

Average Cross Sectional Rank Correlations Between Factors
MSCI World Universe, Regional Sector Neutral Rankings, Last 5 Years

	% Board	% Execs	% Mgrs	% Emp.	C-Suite	Chair Key Comm.	% Key Comm.	Top Earners	Exec/Dir. Pay Gap	Policies	Programs
% Board	1.00	0.20	0.18	0.15	0.06	0.14	0.41	0.13	0.06	0.13	0.17
% Execs	0.20	1.00	0.19	0.14	0.20	0.03	0.06	0.19	0.04	0.03	0.07
% Managers	0.18	0.19	1.00	0.52	0.04	0.01	0.09	0.14	0.09	(0.02)	0.00
% Employees	0.15	0.14	0.52	1.00	0.04	0.07	0.12	0.08	0.08	(0.03)	0.03
C-Suite	0.06	0.20	0.04	0.04	1.00	0.08	0.04	0.31	0.10	(0.01)	(0.01)
Chair Key Comm.	0.14	0.03	0.01	0.07	0.08	1.00	0.35	0.11	0.02	0.03	0.06
% Key Comm.	0.41	0.06	0.09	0.12	0.04	0.35	1.00	0.02	0.02	0.05	0.09
Top Earners	0.13	0.19	0.14	0.08	0.31	0.11	0.02	1.00	0.24	0.00	0.06
Exec/Dir. Pay Gap	0.06	0.04	0.09	0.08	0.10	0.02	0.02	0.24	1.00	0.01	(0.07)
Policies	0.13	0.03	(0.02)	(0.03)	(0.01)	0.03	0.05	0.00	0.01	1.00	0.31
Programs	0.17	0.07	0.00	0.03	(0.01)	0.06	0.09	0.06	(0.07)	0.31	1.00

Source: FactSet, Asset4, TRBI, Morgan Stanley Research

In order to simplify the model structure, we consolidated the various programs variables. So now the "programs" variable counts the number of programs (out of three possible: flexible working schemes, day care services, generous maternity leave benefits) available in the company. **Exhibit 22** shows a more condensed correlation matrix between the themes, where the underlying variables are equally weighted. The matrix shows the average tertile rank (region neutral) correlations between the theme composites over the past five years. **The average correlations between the themes are low and positive.**

Exhibit 22: The five gender diversity themes have a low, positive correlation with each other

Average Rank Correlation of Gender Diversity Themes
MSCI World, Tertile Ranks by Region, Annual, 2011 - 6/2015

	Representation	Empowerment	Pay Parity	Policies	Programs
Representation	1				
Empowerment	0.29	1			
Pay Parity	0.18	0.11	1		
Policies	0.04	0.06	0.01	1	
Programs	0.13	0.07	0.02	0.24	1

Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Weighting Scheme

We feel that some buckets of our five themes (representation, pay parity, etc.) merit more importance than others. However, within these thematic cohorts, we decided to apply equal weights to the underlying variables within each theme in order to guard against over precision/data mining issues. A difficulty in creating a quantitatively derived weighting scheme for the gender diversity model is that there is no clear target variable (unlike, for example, a stock selection model where the target variable is a measure of forward returns). As a result, we cannot use regression based techniques.

A methodology for setting factor weights without resorting to regressions is explained in Medvedev and Vaucher (2015), where the authors' goal is to create factor portfolios. Their methodology only uses the cross sectional correlations between factor exposures and - potentially - a set of views on factors' expected returns. They find a mathematical solution (under a number of assumptions) for the set of factor weights that maximizes the expected excess return of an equally weighted portfolio of top ranked stocks in the most unfavorable set of expected factor returns that is consistent with the manager's views. Under the (reasonable) condition that the aggregate expected performance of the factors is positive, the solution (i.e., set of factor weights) corresponds to

the minimal variance of the portfolio of factors and is straightforward to calculate (as the inverse of the correlation matrix multiplied by the all ones vector). **The resulting weighting scheme increases the weights of indicators that have low correlation with other indicators and reduces the weights of those that are highly correlated.** Applying this methodology to our gender diversity model would ensure that the relative weights in the model take into account the degree of redundancy (or lack thereof) between the themes.

However, correlations between the components are fairly low. As a result, the "minimum variance" approach leads to a set of weights that are little differentiated between the themes, and conveys the idea that the five themes are equally important. In reality, intuition would suggest that, for example, the "pay parity" theme is more important than the "policies" one. **In order to take this observation into account, we opted for an approach similar to portfolio optimization, which identifies the set of weights that maximizes a modified Sharpe ratio, where expected returns are replaced with relative importance scores and the covariance matrix of stock returns is replaced with the cross sectional correlation matrix of the themes**.

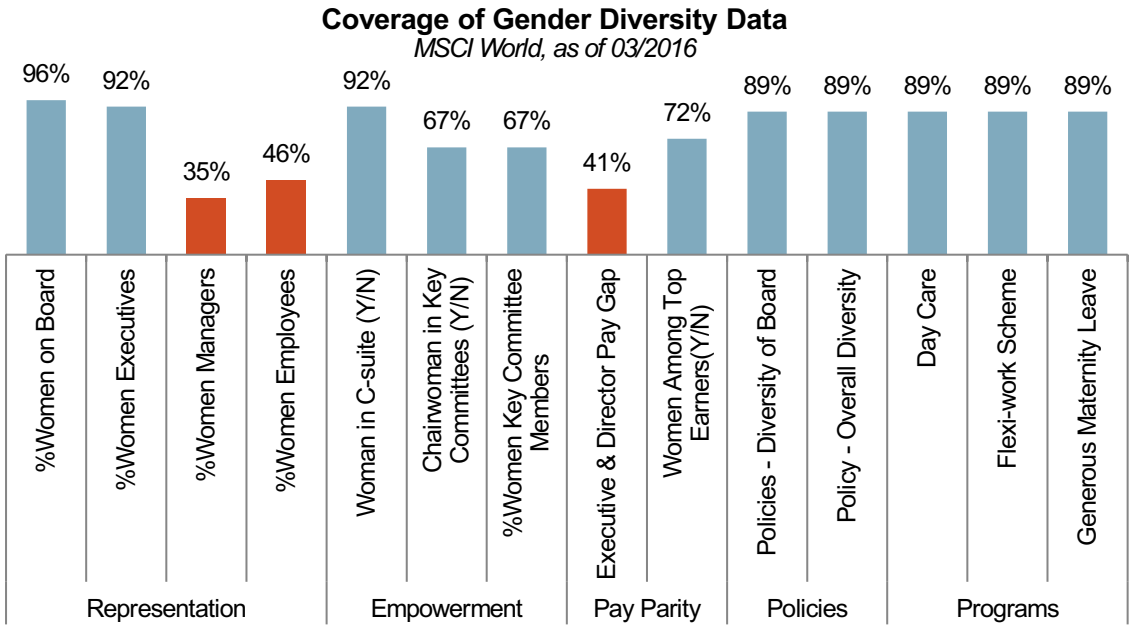
Our framework for assessing the relative importance of the five themes takes into account two criteria: a qualitative assessment of each theme's importance and the extensiveness of each theme's coverage of the MSCI World universe. For each criterion, we rate the five themes between 1 and 3 (1=least important/low coverage, 3=most important/high coverage), and the overall relative importance score is calculated as a linear combination with a 70% weight to the qualitative ranking and a 30% weight to the coverage ranking.

The first criterion is a qualitative assessment of what themes matter the most and the least to women in the workplace. **While we feel all five areas of the framework our important, our judgment is that pay parity and empowerment are the most important characteristics** (four of the six key contributors on this note are women and agree!)

A Gallup survey of US workers from August 2013 (see link in the references section at the end of the note) shows that, among a list of 13 workplace elements, women are the least satisfied, relative to men, with the amount of money they earn and their chances for promotion. By contrast, the survey indicates that women are more satisfied than men with regard to the flexibility of their hours and the amount of vacation time they receive , and equally satisfied relative to men with regard to their health insurance benefits. Therefore, assuming the survey is representative of employees in MSCI World companies, the pay parity, empowerment and representation themes are the most important determinants of women employee satisfaction. **By contrast, while the presence of policies aiming to promote diversity in the workplace is indicative of company commitment, it is nonetheless the least important of our five themes**, as policies are not necessarily followed by measurable results.

We also take the coverage rates of the variables into account. A variable with a low coverage should receive a reduced weight, as a low coverage increases the proportion of stocks that would be mis-evaluated with regard to this variable (since we impute the cross sectional average to stocks with missing values). **Exhibit 23** shows that most of the variables in our gender diversity model have a good coverage of the MSCI World universe, with the exception of the percentages of women employees and managers and the executive & director pay gap. **While the executive/director pay gap is arguably the most important variable in our framework, we are forced to modestly de-emphasize it because of its relatively low data coverage.**

Exhibit 23: Most of our model variables have a good coverage of the MSCI World, except the executive/director pay gap, and the percentages of women managers and employees



Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Exhibit 24 summarizes how we obtain the final relative importance scores. Representation and empowerment get the highest scores, while pay parity gets slightly penalized because of poor data coverage. The "policies" theme is the least important in relative terms.

Exhibit 24: Representation, empowerment and pay parity get the highest relative importance scores

Assigning Relative Importance Scores To Gender Diversity Themes

Theme	Average Coverage In Last 5 Years	Coverage Rank	Qualitative Relative Importance Rank	Final Relative Importance Score
Representation	66%	2	3	2.7
Empowerment	76%	2	3	2.7
Pay Parity	52%	1	3	2.4
Programs	94%	3	2	2.3
Policies	94%	3	1	1.6

Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Our gender diversity model is shown in **Exhibit 25**. **It assigns the largest weights to the "equality in pay" and "empowerment" themes followed by "representation." This characteristic differentiates our model from the frameworks used in currently available gender diversity ETFs, which focus almost exclusively on the representation and empowerment themes.**

Exhibit 25: Our gender diversity model assigns the largest weights to the "equality in pay" and "empowerment" themes

Global Gender Diversity Model

Element	Indicator	Weights	
Equality in Pay	Women Among Top Earners Women Execs/Directors Pay Parity	12% 12%	24%
Enpowerment	Women in C-Suite Women Chairman in Key Committees %Women Key Committee Members	8% 8% 8%	23%
Representation	%Women on Board %Women Executives %Women Managers %Women Employees	5% 5% 5% 5%	20%
Work/Life Balance Programs	Flexible Working Schemes Employee Day Care Services Generous Maternity Leave Benefits	20%	20%
Diversity Policies	Policies for Diversity of Board Policies for Diversity & Equal Opportunity	13%	13%

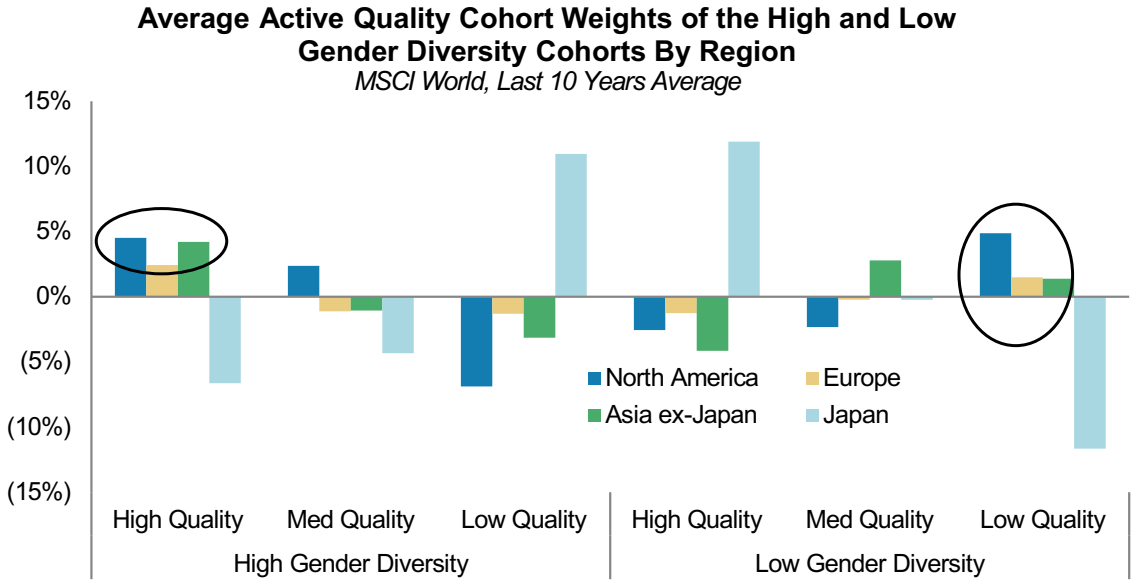
Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Gender Diversity Impact on Fundamentals & Returns

Academics, analysts and economists have provided a long list of theories and observations on the potential impact of gender diversity on corporate fundamentals and stock returns. In this section, we provide some empirical observations in that regard, based on data from the past 10 years of the MSCI World constituents. We use the composite built in the previous section to analyze the relationships between gender diversity, operational performance and stock returns.

Insights from the academic literature suggest that companies that promote gender diversity are more likely to be long-term oriented and to carefully consider a diversity of viewpoints when making strategic decisions, so gender diversity may be related to quality. **Exhibit 26** shows the average active quality cohort weights over the past ten years of the high and low gender diversity cohorts, where the high, medium and low quality cohorts are equal size groups within the MSCI World stock universe. We used our proprietary quality composite - which includes four components: profitability, fundamental stability, payout and safety (beta, leverage, bankruptcy risk...) - in this analysis. **Consistent with intuition, outside Japan, the high gender diversity cohort has been tilted towards high quality stocks over the past ten years, while the low gender diversity cohort has exhibited a slight bias towards low quality stocks**. The Japan gender diversity cohorts exhibit the opposite bias, but the lack of data availability for variables representing ~50% of the model's weight make conclusions regarding Japan less robust than in the other regions.

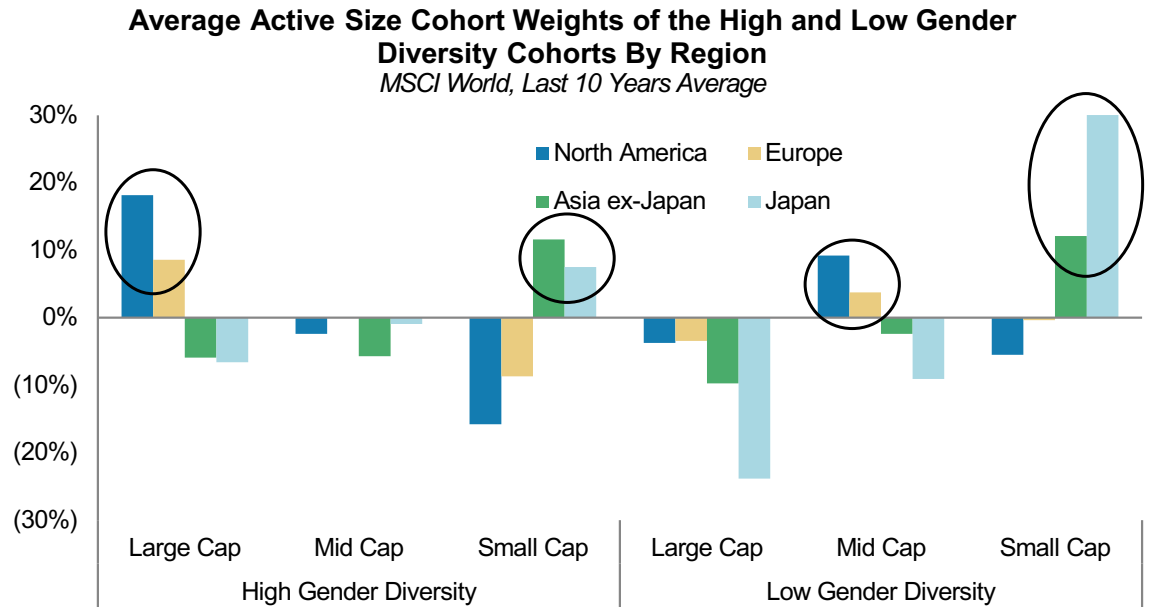
Exhibit 26: The high (low) gender diversity cohort has been tilted towards high (low) quality stocks outside Japan over the past five years



Source: FactSet, Asset4, TRBI, Morgan Stanley Research

In addition, high gender diversity stocks have had a tilt towards large caps over the past 10 years in North America and Europe and a tilt toward small and mid caps in Asia (**Exhibit 27**). The low gender diversity cohorts have exhibited tilts towards mid caps in North America and Europe, and towards small caps in Asia. The small, mid and large cap cohorts were created by ranking MSCI World stocks into three equal size groups.

Exhibit 27: High gender diversity stocks have exhibited a large cap bias in North America and Europe over the past 10 years



Source: FactSet, Asset4, TRBI, Morgan Stanley Research

As can be expected, the turnover of our gender diversity model is low, as are its underlying components. **Exhibit 28** shows, in each region and for each of the three tertiles of our model, the percentages of stocks staying in the same tertile and moving to a different tertile over the course of the year (the sum of percentages across a given row in a given region is 100%). The numbers in the exhibit represent the average transition percentages over the past 7 years. **Between 70% and 80% of companies in the top and bottom tertiles of our gender diversity model remain in the same tertile after a year has elapsed**, and very few companies transition from low to high (or vice versa) diversity rankings over the course of one year. 50%-60% of medium gender diversity companies remain in the medium tertile after one year, with the remainder transitioning up or down in roughly equal proportions.

Exhibit 28: The top and bottom tertiles of our gender diversity model have exhibited a low annual turnover across regions over the past nine years

Year over Year Shift in Diversity Rankings

MSCI World, 03/2007- 03/2016

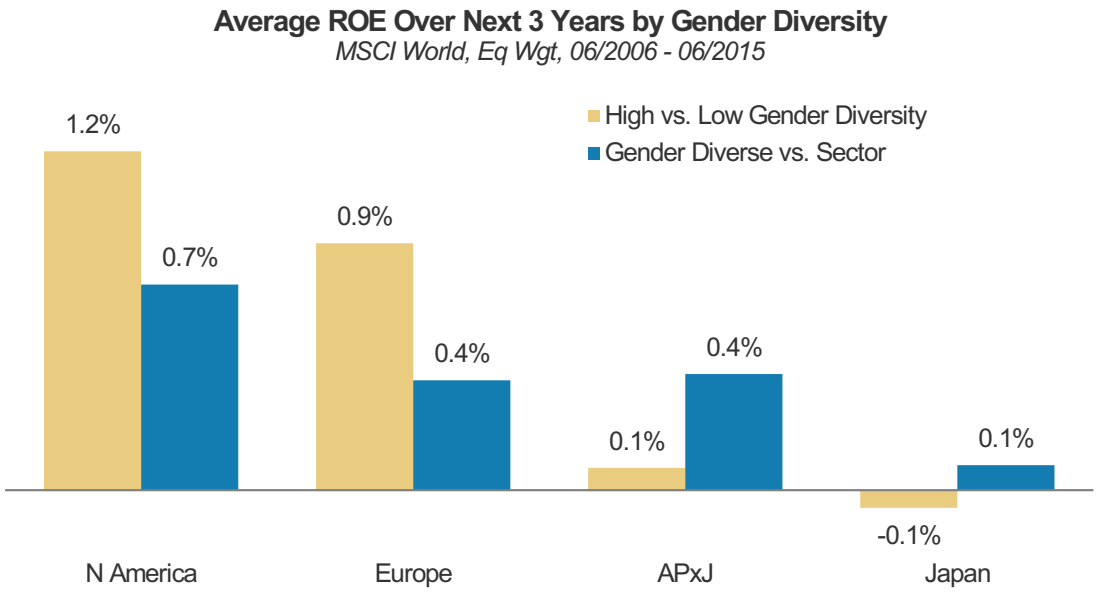
		North America			Asia ex-Japan			Europe			Japan		
		Next Year Diversity			Next Year Diversity			Next Year Diversity			Next Year Diversity		
		High	Medium	Low	High	Medium	Low	High	Medium	Low	High	Medium	Low
Current Diversity	High	**76%**	22%	2%	**74%**	22%	3%	**72%**	24%	4%	**70%**	27%	3%
	Medium	19%	**58%**	23%	19%	**56%**	25%	22%	**52%**	27%	24%	**58%**	18%
	Low	4%	20%	**76%**	5%	22%	**73%**	6%	23%	**71%**	4%	20%	**77%**

Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Intuitively, gender diversity should bring long term benefits in terms of fundamental performance, as the inclusion of women's points of view at various levels of the company can help the organization make more balanced, long-term, and more robust decisions. However, the impact of gender diversity may not necessarily materialize in shorter horizons as some academic literature indicates that while superior solutions are more often reached among heterogeneous communities, they sometimes take longer to form. We compared, in terms of fundamental metrics with a three year horizon, the high and low gender diversity cohorts and the gender diverse stocks relative to their sector peers, in each region. (The analysis is based on data from the past ten years). **Exhibit 29shows that high gender diversity companies deliver an incremental ROE of ~1% over the next three years relative to low gender diversity companies in North America and Europe**. The ROE differential of high gender diversity companies relative to their sector peers is 0.7% in North America and 0.4%

in Europe. We don't observe meaningful ROE differentials in Asia.

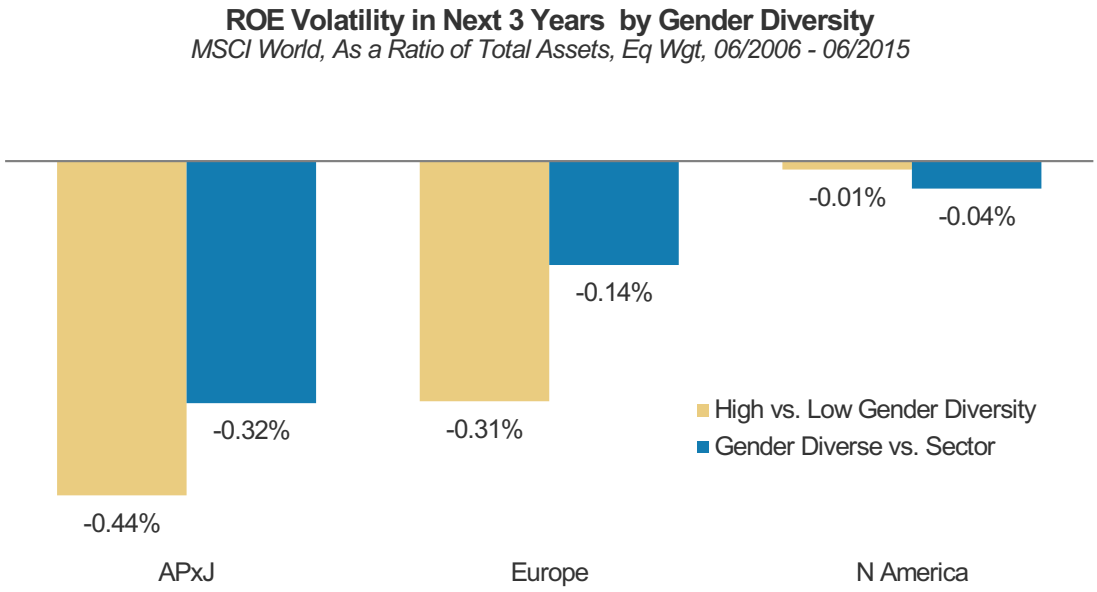
Exhibit 29: High gender diversity companies deliver an incremental ROE of ~1% relative to low gender diversity companies over a 3-year horizon in North America and in Europe



Source: FactSet, Asset4, Morgan Stanley Research

High gender diversity companies also display a lower ROE volatility over a 3-year horizon relative to their low gender diversity or sector peers in Asia Pacific ex. Japan and Europe (**Exhibit 30**). We have not observed a lower ROE volatility among gender diverse companies in North America. The higher ROE and lower ROE volatility exhibited by high gender diversity companies is consistent with the high quality tilt mentioned above.

Exhibit 30: High gender diversity companies also exhibit lower ROE volatility over a 3-year horizon compared to low gender diversity companies or their sector peers

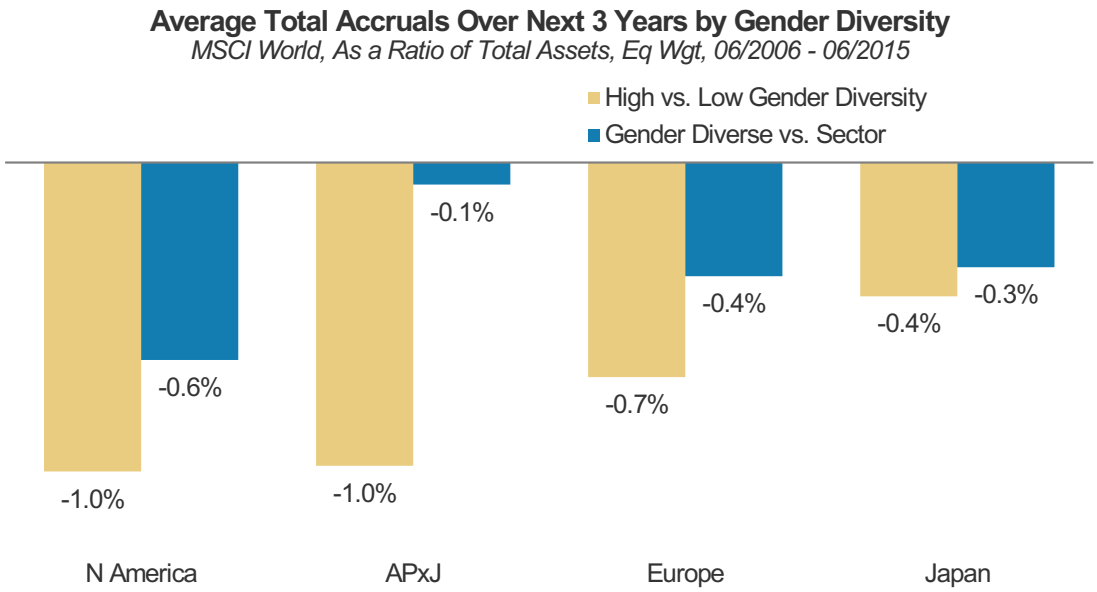


Source: FactSet, Asset4, TRBI, Morgan Stanley Research

The long term earnings quality - measured by the average total accruals over assets over a 3-year horizon - of high gender diversity companies is higher than that of low gender diversity companies and that of their sector peers, across regions (i.e. high gender diversity companies have lower accruals), as

shown in **Exhibit 31**. One possible explanation is that the presence of women in top executive positions or on the board of directors may reduce the likelihood of the company resorting to aggressive accounting techniques.

Exhibit 31: High gender diversity companies have lower accruals (over a 3-year horizon) than their low gender diversity or sector peers



Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Considering the annual reporting frequencies and the long reporting lags associated with ESG data, we assume that data points become available 12 months after the end of the fiscal year. The data are held constant for 12 months until next year's data points become available and companies are ranked every month based on the most recently available data. **Exhibit 32** shows the average annualized monthly performance by region between January 2011 and April 2016 (through April 22nd) of the high gender diversity cohort (where stocks are equally weighted) relative to the cap weighted regional benchmark and relative to the equally weighted low gender diversity cohort. The table also shows similar relative performance numbers for the underlying gender diversity themes. **Over the past five years, high gender diversity companies have modestly outperformed low gender diversity companies on a monthly annualized basis over the past five years, by +2.3% in North America, by +1.3% in Europe and by +1.0% in Asia Pacific ex. Japan**. **Besides, the high diversity cohort has outperformed the regional benchmark across regions - including Japan - so investing in high gender diversity stocks can be moderately accretive to performance.** The average performance of the underlying components is mostly positive.

Exhibit 32: High gender diversity stocks have outperformed low gender diversity stocks by +2.3% in North America and by +1.3% in Europe over the past 10 years (on a monthly annualized basis)

Gender Diversity: Annualized Performance by Region
MSCI World, Monthly $ Returns, Eq Wgt, 2011 - 4/2016

Gender Diverse v. Cap Wgt Region

Region	Model		Represen-tation	Empower-ment	Pay Parity	Policies	Programs
	Ann. Info Ratio	Avg. Ann Rel. Return	Average Annualized Monthly Returns				
APxJ	0.61	2.1%	3.2%	1.1%	2.3%	(0.3%)	1.3%
Europe	0.21	0.7%	2.2%	1.4%	1.0%	1.4%	0.6%
N America	0.20	0.5%	0.3%	0.2%	1.0%	(0.4%)	0.3%
Japan	0.16	0.5%	0.9%			1.4%	1.0%

Gender Diverse v. Not Diverse

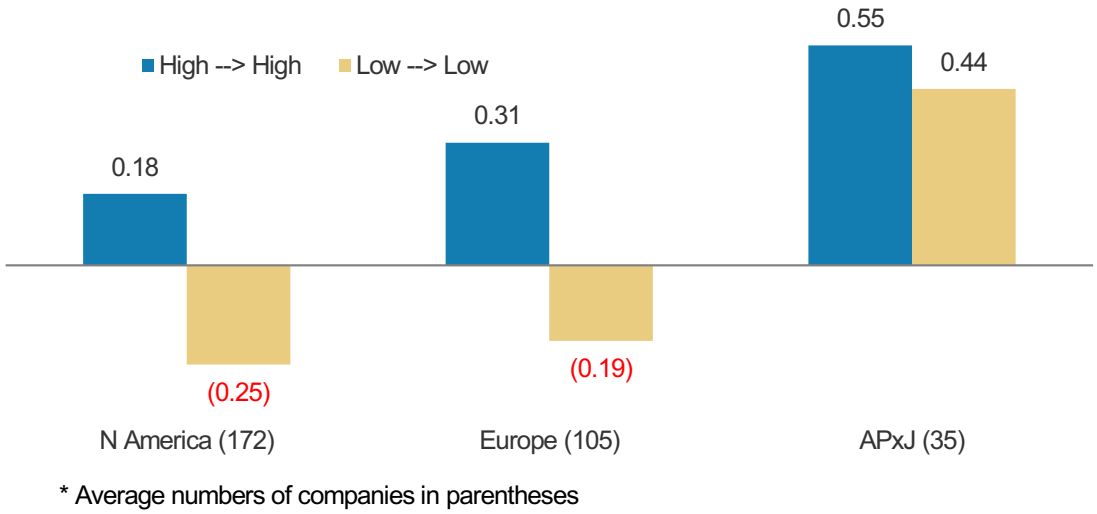
Region	Model		Represen-tation	Empower-ment	Pay Parity	Policies	Programs
	Ann. Info Ratio	Avg. Ann Rel. Return	Average Annualized Monthly Returns				
N America	0.72	2.3%	1.4%	1.2%	2.1%	3.2%	0.4%
Europe	0.35	1.3%	2.3%	(0.2%)	(0.3%)	0.9%	1.1%
APxJ	0.14	1.0%	4.5%	(0.3%)	2.1%	(1.2%)	0.7%
Japan	(0.17)	(1.0%)	(2.0%)			(1.6%)	(0.9%)

Source: FactSet, Asset4,TRBI, Morgan Stanley Research

Given the low turnover of our gender diversity model, there are not enough stocks transitioning between gender diversity cohorts within a given year to assess the average performance of the companies who experience an improvement or a degradation in their gender diversity rankings. However, (**Exhibit 33**)**stocks with persistently high (low) gender diversity rankings year over year have outperformed (underperformed) the cap weighted regional average in both North America and in Europe over the past five years.**

Exhibit 33: Stocks with persistently high (low) gender diversity rankings year over year have out (under) performed on average in North America and Europe over the past five years

Information Ratios: Persistent YoY Gender Diversity Ranks
MSCI World, Rel to Cap Wgt Regional Average, 2011 - 4/22/2016



Source: FactSet, Asset4,TRBI, Morgan Stanley Research

ESG related (including gender diversity based) criteria are often used as a filter to determine the investable

universe of companies (for example, by investors with an ESG mandate). While there are concerns that reducing the investable universe may be detrimental to returns, our analysis shows that this is not necessarily the case. **Exhibit 34** shows, in the top panels, the annualized monthly information ratio and average relative to market return by MOST model quintile (our proprietary 3-month forward stock level alpha model) and gender diversity tertile, over the past five years based on the overall MSCI World universe. The bottom panels show the annualized standard deviation of relative returns and the percentage of occurrence of significant draw downs by MOST quintile and gender diversity tertile. **The subset of high gender diversity stocks within the top quintile of MOST has outperformed meaningfully the rest of the top quintile of MOST (and thus the MSCI World) on a risk adjusted basis over the past five years. The performance improvement has come from the reduced return volatility compared to the rest of Q1. The stocks that rank well per both MOST and the gender diversity model also have the lowest probability (out of the 15 bivariate cohorts) of experiencing a >10% monthly performance drawdown.** By contrast, stocks that have both poor MOST and poor gender diversity rankings have the highest probability of experiencing a meaningful drawdown. This is an extremely important finding from our diversity studies!

Exhibit 34: The high gender diversity subset of the top quintile of MOST has meaningfully outperformed the rest of the top quintile of MOST on a volatility adjusted basis over the past five years

Gender Diversity vs. Stock Selection Model

MSCI World: Annualized Monthly $ Returns

Independent Sorts by Region, Cap Wgt Region, 2011 - 4/22/2016

		Gender Diversity				Gender Diversity		
		High	Medium	Low		High	Medium	Low
	Information Ratios				***Average Relative Returns***			
Global MOST Model	Top	2.22	2.15	1.39	Top	4.6%	5.0%	5.1%
	Q2	0.11	0.54	0.64	Q2	0.3%	1.6%	2.0%
	Q3	(0.01)	(0.06)	0.00	Q3	(0.0%)	(0.2%)	0.0%
	Q4	0.26	(0.48)	(1.20)	Q4	0.7%	(1.5%)	(3.8%)
	Bottom	(1.06)	(0.60)	(1.17)	Bottom	(3.7%)	(2.3%)	(4.8%)
	Std. Dev. of Relative Returns				***Share of Significant Drawdowns****			
Global MOST Model	Top	2.1%	2.3%	3.6%	Top	6.1%	6.5%	7.1%
	Q2	2.7%	2.9%	3.1%	Q2	7.3%	7.4%	7.4%
	Q3	2.5%	2.7%	3.4%	Q3	7.7%	7.8%	7.8%
	Q4	2.8%	3.0%	3.2%	Q4	7.8%	8.4%	9.0%
	Bottom	3.5%	3.7%	4.1%	Bottom	8.9%	9.2%	9.3%

* <-10% USD total return in one month

Source: FactSet, Asset4, TRBI, Morgan Stanley Research

Exhibit 35 and **Exhibit 36** show screens of global stocks that rank favorably and unfavorably in our gender diversity model. The favorable screen includes stocks that are in the top two quintiles of our MOST stock selection model and in the top tertile of our gender diversity composite. The unfavorable screen consists of stocks that are in the bottom two quintiles of MOST and in the bottom tertile of our gender diversity composite.

Exhibit 35: Favorable screen: stocks in the top two quintiles of MOST and the top tertile of our gender diversity composite

High Gender Diversity Companies With Attractive Quant Model Rankings

MSCI World, Sorted by Market Cap, As of 3/2016

Sedol	Ticker	Company	Country	Sector	Market Cap ($Bil.)
North America					
2475833	JNJ-US	JOHNSON & JOHNSON	United States	Health Care	299.4
2090571	VZ-US	VERIZON COMMUNICATIONS	United States	Telecom	220.0
2369174	GILD-US	GILEAD SCIENCES	United States	Health Care	132.4
2455965	BIIB-US	BIOGEN IDEC	United States	Health Care	58.0
B7VD3F2	DUK-US	DUKE ENERGY CORP	United States	Utilities	55.5
B3SPXZ3	LYB-US	LYONDELLBASELL INDS A	United States	Materials	38.5
2367026	GIS-US	GENERAL MILLS	United States	Consumer Staples	37.9
2459020	INTU-US	INTUIT	United States	Information Technology	27.5
2379504	NVDA-US	NVIDIA	United States	Information Technology	19.2
2214832	CA-US	CA INC	United States	Information Technology	13.5
B42BPG9	CCE-US	COCA-COLA ENTRPRS (NEW)	United States	Consumer Staples	11.5
2980906	FL-US	FOOT LOCKER	United States	Consumer Discretionary	9.0
2066408	AVY-US	AVERY DENNISON CORP	United States	Materials	6.6
2636254	DNB-US	DUN & BRADSTREET CORP	United States	Industrials	3.7
B247H10	TDC-US	TERADATA	United States	Information Technology	3.5
Europe					
5671735	SAN-FR	SANOFI	France	Health Care	105.4
0925288	GSK-GB	GLAXOSMITHKLINE	United Kingdom	Health Care	98.8
5842359	DTE-DE	DEUTSCHE TELEKOM	Germany	Telecom	82.8
0237400	DGE-GB	DIAGEO	United Kingdom	Consumer Staples	68.0
7088429	CS-FR	AXA	France	Financials	58.1
7133608	STL-NO	STATOIL	Norway	Energy	50.2
5959378	ERIC.B-SE	ERICSSON (LM) B	Sweden	Information Technology	33.1
B3MSM28	AMS-ES	AMADEUS IT HLDG A	Spain	Information Technology	18.8
7062713	SW-FR	SODEXO	France	Consumer Discretionary	17.0
B7VG6L8	O2D-DE	TELEFONICA DEUTSCHLAND	Germany	Telecom	16.1
5596991	UCB-BE	UCB (GROUPE)	Belgium	Health Care	14.9
0922320	SN-GB	SMITH & NEPHEW	United Kingdom	Health Care	14.8
3180943	LAND-GB	LAND SECURITIES GROUP	United Kingdom	Financials	12.5
5701513	ELI1V-FI	ELISA A	Finland	Telecom	6.5
4874160	TEC-FR	TECHNIP	France	Energy	6.5
APxJ					
6948836	WES-AU	WESFARMERS	Australia	Consumer Staples	35.9
6097017	2-HK	CLP HOLDINGS	Hong Kong	Utilities	22.8
6200882	TCL-AU	TRANSURBAN GROUP	Australia	Industrials	17.7
6271026	IAG-AU	INSURANCE AUSTRALIA GRP.	Australia	Financials	10.4
6810429	83-HK	SINO LAND	Hong Kong	Financials	9.6
6366795	G13-SG	GENTING SINGAPORE PLC	Singapore	Consumer Discretionary	7.5
6710347	QAN-AU	QANTAS AIRWAYS	Australia	Industrials	6.5
6086253	FMG-AU	FORTESCUE METALS GROUP	Australia	Materials	6.1
6197928	C09-SG	CITY DEVELOPMENTS	Singapore	Financials	5.5
6161978	MGR-AU	MIRVAC GROUP	Australia	Financials	5.5
6123451	CCL-AU	COCA-COLA AMATIL	Australia	Consumer Staples	5.2
6574071	8-HK	PCCW	Hong Kong	Telecom	4.9
B01WT63	DUE-AU	DUET GROUP	Australia	Utilities	4.1
6341606	FBU-NZ	FLETCHER BUILDING	New Zealand	Materials	3.8
6873262	TAH-AU	TABCORP HOLDINGS	Australia	Consumer Discretionary	2.7
Japan					
6010906	2802-JP	AJINOMOTO CO	Japan	Consumer Staples	13.4
6429126	4217-JP	HITACHI CHEMICAL CO	Japan	Materials	3.8
6055208	5201-JP	ASAHI GLASS CO	Japan	Industrials	6.5
6195609	9502-JP	CHUBU ELECTRIC POWER CO	Japan	Utilities	10.6
6597067	7011-JP	MITSUBISHI HEAVY IND	Japan	Industrials	12.5
6466985	7013-JP	IHI CORP	Japan	Industrials	3.3
6366007	5012-JP	TONENGENERAL SEKIYU	Japan	Energy	5.1
6744294	8795-JP	T&D HOLDINGS	Japan	Financials	6.4
6534202	8905-JP	AEON MALL CO	Japan	Financials	3.4
6880507	3401-JP	TEIJIN	Japan	Materials	3.4
6563024	8316-JP	SUMITOMO MITSUI FINL GRP	Japan	Financials	42.9
6597368	4183-JP	MITSUI CHEMICALS	Japan	Materials	3.4
B0J7D91	4568-JP	DAIICHI SANKYO CO	Japan	Health Care	15.8
6356365	6504-JP	FUJI ELECTRIC CO	Japan	Industrials	2.6
6643960	9101-JP	NIPPON YUSEN K.K	Japan	Industrials	3.3

Source: FactSet, Asset4, TRBI, Morgan Stanley Research. For important disclosures regarding companies that are the subject of this screen, please see the Morgan Stanley Research Disclosure Website at www.morganstanley.com/researchdisclosures. For valuation methodology and risks associated with any price targets, ratings and recommendations referenced in this research report, please contact the Client Support Team as follows: US/Canada +1 800 303-2495; Hong Kong +852 2848-5999; Latin America +1 718 754-5444 (U.S.); London +44 (0)20-7425-8169; Singapore +65 6834-6860; Sydney +61 (0)2-9770-1505; Tokyo +81 (0)3-5424-4349. Alternatively you may contact your investment representative or Morgan Stanley Research at 1585 Broadway (Attention: Research Management), New York, NY 10036 USA. Prices as of 04/29/2016 (in local currency on Primary exchange): JNJ-US: 112.08, VZ-US: 50.94, GILD-US: 88.21, BIIB-US: 274.99, DUK-US: 78.78, LYB-US: 82.67, GIS-US: 61.34, INTU-US: 100.89, NVDA-US: 35.53, CA-US: 29.66, CCE-US: 52.48, FL-US: 61.44, AVY-US: 72.61, DNB-US: 110.41, TDC-US: 25.3, SAN-FR: 72.11, GSK-GB: 14.59, DTE-DE: 15.285, DGE-GB: 18.46, CS-FR: 22.015, STL-NO: 142.3, ERIC.B-SE: 65, AMS-ES: 39.74, SW-FR: 88.19, O2D-DE: 4.434, UCB-BE: 65.35, SN-GB: 11.56, LAND-GB: 11.32, ELI1V-FI: 32.61, TEC-FR: 51.11, WES-AU: 42.77, 2-HK: 71.75, TCL-AU: 11.58, IAG-AU: 5.77, 83-HK: 12.22, G13-SG: 0.815, QAN-AU: 3.22, FMG-AU: 3.41, C09-SG: 8.34, MGR-AU: 1.87, CCL-AU: 8.6, 8-HK: 5.26, DUE-AU: 2.25, FBU-NZ: 8.34, TAH-AU: 4.43, 2802-JP: 2555, 4217-JP: 1876, 5201-JP: 649, 9502-JP: 1450.5, 7011-JP: 397.5, 7013-JP: 245, 5012-JP: 1047, 8795-JP: 1081.5, 8905-JP: 1531, 3401-JP: 397, 8316-JP: 3413, 4183-JP: 372, 4568-JP: 2601, 6504-JP: 475, 9101-JP: 217

Exhibit 36: Unfavorable screen: stocks in the bottom two quintiles of MOST and in the bottom tertile of our gender diversity composite

Low Gender Diversity Companies With Unattractive Quant Model Rankings

MSCI World, Sorted by Market Cap, As of 3/2016

Sedol	Ticker	Company	Country	Sector	Market Cap ($Bil.)
North America					
2170473	STZ-US	CONSTELLATION BRANDS A	United States	Consumer Staples	29.6
2131179	AVB-US	AVALONBAY COMMUNITIES	United States	Financials	26.0
B4XT1S6	CHTR-US	CHARTER COMMUNICATION A	United States	Consumer Discretionary	22.7
2749602	ROP-US	ROPER INDUSTRIES	United States	Industrials	18.4
B0X7DZ3	CMG-US	CHIPOTLE MEXICAN GRILL	United States	Consumer Discretionary	14.7
2380863	GWW-US	GRAINGER (WW)	United States	Industrials	14.7
B87ZMX0	PANW-US	PALO ALTO NETWORKS	United States	Information Technology	14.0
2523022	L-US	LOEWS CORP	United States	Financials	13.6
2028323	JAH-US	JARDEN CORP	United States	Consumer Discretionary	13.0
B03GQS4	DLR-US	DIGITAL REALTY TRUST	United States	Financials	12.9
B57FG04	CVE-CA	CENOVUS ENERGY	Canada	Energy	10.9
B29NF31	FNV-CA	FRANCO-NEVADA CORP	Canada	Materials	10.8
BLNN369	WFT-US	WEATHERFORD INT'L PLC	United States	Energy	6.8
B058ZX6	SLW-CA	SILVER WHEATON	Canada	Materials	6.7
2182531	CLB-US	CORE LABORATORIES	United States	Energy	4.8
Europe					
0709954	PRU-GB	PRUDENTIAL	United Kingdom	Financials	48.1
B11WWH2	SCHN-CH	SCHINDLER NAMEN	Switzerland	Industrials	20.7
4519579	KRZ-IE	KERRY GROUP A	Ireland	Consumer Staples	16.4
7582556	LI-FR	KLEPIERRE	France	Financials	15.1
B1WGG93	GEBN-CH	GEBERIT	Switzerland	Industrials	14.2
B1KJJ40	WTB-GB	WHITBREAD	United Kingdom	Consumer Discretionary	10.4
5806225	COLR-BE	COLRUYT	Belgium	Consumer Staples	9.1
B06HZC1	EXO-IT	EXOR ORD	Italy	Financials	8.8
B01C3S3	RRS-GB	RANDGOLD RESOURCES	United Kingdom	Materials	8.5
B0R80X9	DUFN-CH	DUFRY GROUP	Switzerland	Consumer Discretionary	6.7
0045614	ANTO-GB	ANTOFAGASTA	United Kingdom	Materials	6.7
0053673	AHT-GB	ASHTEAD GROUP	United Kingdom	Industrials	6.3
5476929	BARN-CH	BARRY CALLEBAUT	Switzerland	Consumer Staples	6.0
6455530	ICL-IL	ISRAEL CHEMICALS	Israel	Materials	5.5
BD4TZK8	OCI-NL	OCI NV	Netherlands	Materials	4.1
APxJ					
B4TX8S1	1299-HK	AIA GROUP	Hong Kong	Financials	68.3
6916781	U11-SG	UNITED OVERSEAS BANK	Singapore	Financials	22.6
6436557	3-HK	HONGKONG CHINA GAS	Hong Kong	Utilities	21.6
6075648	23-HK	BANK EAST ASIA	Hong Kong	Financials	9.9
BY7QXS7	VCX-AU	VICINITY CENTRES	Australia	Financials	9.7
B0190C7	669-HK	TECHTRONIC INDUSTRIES CO	Hong Kong	Consumer Discretionary	7.2
B4KJWS6	MC0-SG	GLOBAL LOGISTIC PROP	Singapore	Financials	6.9
6512004	LLC-AU	LEND LEASE GROUP	Australia	Financials	6.2
B60QWJ2	JHX-AU	HARDIE (JAMES) IND	Australia	Materials	6.1
BKX3XG2	AIA-NZ	AUCKLAND INT'L AIRPORT	New Zealand	Industrials	5.3
6563875	A17U-SG	ASCENDAS REAL ESTATE INV	Singapore	Financials	4.4
B1CNDB5	CC3-SG	STARHUB	Singapore	Telecom	4.3
6339872	142-HK	FIRST PACIFIC CO	Hong Kong	Financials	3.2
6002453	522-HK	ASM PACIFIC TECHNOLOGY	Hong Kong	Information Technology	3.2
6205133	S51-SG	SEMBCORP MARINE	Singapore	Industrials	2.6
Japan					
6490995	6861-JP	KEYENCE CORP	Japan	Information Technology	33.2
6763965	6273-JP	SMC CORP	Japan	Industrials	15.7
6644800	9843-JP	NITORI HOLDINGS CO	Japan	Consumer Discretionary	10.5
B02K2M3	2413-JP	M3	Japan	Health Care	8.2
6496324	7276-JP	KOITO MANUFACTURING CO	Japan	Consumer Discretionary	7.3
6640507	4612-JP	NIPPON PAINT HOLDINGS CO	Japan	Materials	7.2
B3QX5G4	4581-JP	TAISHO PHARM HOLDINGS CO	Japan	Health Care	7.2
6758455	7453-JP	RYOHIN KEIKAKU CO	Japan	Consumer Discretionary	5.9
6487362	9008-JP	KEIO CORP	Japan	Industrials	5.7
6269861	7532-JP	DON QUIJOTE HOLDINGS CO	Japan	Consumer Discretionary	5.5
6640961	2002-JP	NISSHIN SEIFUN GROUP	Japan	Consumer Staples	4.8
6405870	6965-JP	HAMAMATSU PHOTONICS K.K	Japan	Information Technology	4.6
6804035	8227-JP	SHIMAMURA CO	Japan	Consumer Discretionary	4.6
6428725	6806-JP	HIROSE ELECTRIC CO	Japan	Information Technology	4.4
6433127	9505-JP	HOKURIKU ELECTRIC POWER	Japan	Utilities	3.0

Source: FactSet, Asset4, TRBI, Morgan Stanley Research. For important disclosures regarding companies that are the subject of this screen, please see the Morgan Stanley Research Disclosure Website at www.morganstanley.com/researchdisclosures. For valuation methodology and risks associated with any price targets, ratings and recommendations referenced in this research report, please contact the Client Support Team as follows: US/Canada +1 800 303-2495; Hong Kong +852 2848-5999; Latin America +1 718 754-5444 (U.S.); London +44 (0)20-7425-8169; Singapore +65 6834-6860; Sydney +61 (0)2-9770-1505; Tokyo +81 (0)3-5424-4349. Alternatively you may contact your investment representative or Morgan Stanley Research at 1585 Broadway (Attention: Research Management), New York, NY 10036 USA. Prices as of 04/29/2016 (in local currency on Primary exchange): STZ-US: 156.06, AVB-US: 176.79, CHTR-US: 212.24, ROP-US: 176.09, CMG-US: 420.97, GWW-US: 234.52, PANW-US: 150.87, L-US: 39.68, JAH-US: 58.97, DLR-US: 87.98, CVE-CA: 19.89, FNV-CA: 88.1, WFT-US: 8.13, SLW-CA: 26.29, CLB-US: 133.66, PRU-GB: 13.475, SCHN-CH: 176.3, KRZ-IE: 77.87, LI-FR: 41.075, GEBN-CH: 368.3, WTB-GB: 38.72, COLR-BE: 50.28, EXO-IT: 32.8, RRS-GB: 67.7, DUFN-CH: 126.2, ANTO-GB: 4.832, AHT-GB: 9.075, BARN-CH: 1127, ICL-IL: 18.54, OCI-NL: 17.265, 1299-HK: 46.7, U11-SG: 18.6, 3-HK: 14.48, 23-HK: 28.25, VCX-AU: 3.32, 669-HK: 29.15, MC0-SG: 1.915, LLC-AU: 12.7, JHX-AU: 18.53, AIA-NZ: 6.15, A17U-SG: 2.46, CC3-SG: 3.31, 142-HK: 4.92, 522-HK: 56, S51-SG: 1.6700001, 6861-JP: 67160, 6273-JP: 27345, 9843-JP: 10280, 2413-JP: 3010, 7276-JP: 4840, 4612-JP: 2952, 4581-JP: 9000, 7453-JP: 24670, 9008-JP: 970, 7532-JP: 3975, 2002-JP: 1799, 6965-JP: 3085, 8227-JP: 14830, 6806-JP: 13510, 9505-JP: 1436

Exhibit 37 is a screen containing the largest company in each sector by market value among the universe of companies that have been consistently ranked in the top gender diversity tertile over the past two years.

Exhibit 37: Screen of companies that have been consistently ranked in the top gender diversity tertile over the past two years

Select High Gender Diversity Companies* in Two Consecutive Years by Sector
MSCI World, As of End-March 2016

Sedol	Ticker	Company	Sector	Country	Market Cap ($Bil.)
North America					
2588173	MSFT-US	MICROSOFT CORP	Information Technology	United States	441.2
2475833	JNJ-US	JOHNSON & JOHNSON	Health Care	United States	299.4
2000019	AMZN-US	AMAZON.COM	Consumer Discretionary	United States	278.3
2704407	PG-US	PROCTER & GAMBLE CO	Consumer Staples	United States	223.9
2838555	CVX-US	CHEVRON CORP	Energy	United States	179.5
2595708	MMM-US	3M CO	Industrials	United States	102.6
2754383	RY-CA	ROYAL BANK OF CANADA	Financials	Canada	85.9
B7VD3F2	DUK-US	DUKE ENERGY CORP	Utilities	United States	55.5
2018175	DD-US	DU PONT (E.I) DE NEMOURS	Materials	United States	55.5
2185046	CTL-US	CENTURYLINK	Telecom	United States	17.5
Europe					
7123870	NESN-CH	NESTLE	Consumer Staples	Switzerland	239.2
7103065	NOVN-CH	NOVARTIS	Health Care	Switzerland	194.8
B15C557	FP-FR	TOTAL	Energy	France	111.3
BP9DL90	ITX-ES	INDITEX	Consumer Discretionary	Spain	105.0
5727973	SIE-DE	SIEMENS	Industrials	Germany	93.5
5842359	DTE-DE	DEUTSCHE TELEKOM	Telecom	Germany	82.8
0870612	LLOY-GB	LLOYDS BANKING GROUP	Financials	United Kingdom	69.8
0718875	RIO-GB	RIO TINTO PLC	Materials	United Kingdom	50.5
B288C92	IBE-ES	IBERDROLA	Utilities	Spain	43.2
5959378	ERIC.B-SE	ERICSSON (LM) B	Information Technology	Sweden	33.1
APxJ					
6215035	CBA-AU	COMMONWEALTH BANK	Financials	Australia	98.4
6087289	TLS-AU	TELSTRA CORP	Telecom	Australia	50.1
BW9P816	1-HK	CK HUTCHISON HOLDINGS	Industrials	Hong Kong	50.1
6948836	WES-AU	WESFARMERS	Consumer Staples	Australia	35.9
BSS7GP5	AGL-AU	AGL ENERGY	Utilities	Australia	9.6
B4JSTL6	1128-HK	WYNN MACAU	Consumer Discretionary	Hong Kong	8.0
6161503	CTX-AU	CALTEX AUSTRALIA	Energy	Australia	7.1
6458001	ORI-AU	ORICA	Materials	Australia	4.4
6180412	CPU-AU	COMPUTERSHARE	Information Technology	Australia	4.2
BP46PW5	HSO-AU	HEALTHSCOPE	Health Care	Australia	3.6
Japan					
6248990	9433-JP	KDDI	Telecom	Japan	72.0
6335171	8306-JP	MITSUBISHI UFJ FIN GRP	Financials	Japan	65.7
6642860	7201-JP	NISSAN MOTOR CO	Consumer Discretionary	Japan	41.9
B0FS5D6	3382-JP	SEVEN & I HOLDINGS CO	Consumer Staples	Japan	37.8
6298542	9020-JP	EAST JAPAN RAILWAY CO	Industrials	Japan	33.9
6985383	4503-JP	ASTELLAS PHARMA	Health Care	Japan	29.6
6639550	7974-JP	NINTENDO CO	Information Technology	Japan	20.2
6895448	9531-JP	TOKYO GAS CO	Utilities	Japan	11.2
B10RB15	1605-JP	INPEX CORP	Energy	Japan	11.1
6054603	3407-JP	ASAHI KASEI CORP	Materials	Japan	9.5

** Companies associated with penalties or fines due to a controversy linked to workforce diversity and opportunity according to Asset4 Database are excluded*

Source: FactSet, Asset4, TRBI, Morgan Stanley Research. For important disclosures regarding companies that are the subject of this screen, please see the Morgan Stanley Research Disclosure Website at www.morganstanley.com/researchdisclosures. For valuation methodology and risks associated with any price targets, ratings and recommendations referenced in this research report, please contact the Client Support Team as follows: US/Canada +1 800 303-2495; Hong Kong +852 2848-5999; Latin America +1 718 754-5444 (U.S.); London +44 (0)20-7425-8169; Singapore +65 6834-6860; Sydney +61 (0)2-9770-1505; Tokyo +81 (0)3-5424-4349. Alternatively you may contact your investment representative or Morgan Stanley Research at 1585 Broadway (Attention: Research Management), New York, NY 10036 USA. Prices as of 04/29/2016 (in local currency on Primary exchange): MSFT-US: 49.87, JNJ-US: 112.08, AMZN-US: 659.59, PG-US: 80.12, CVX-US: 102.18, MMM-US: 167.38, RY-CA: 77.92, DUK-US: 78.78, DD-US: 65.91, CTL-US: 30.95, NESN-CH: 71.5, NOVN-CH: 73.2, FP-FR: 43.93, ITX-ES: 28.035, SIE-DE: 91.12, DTE-DE: 15.285, LLOY-GB: 0.6707, RIO-GB: 23.005, IBE-ES: 6.204, ERIC.B-SE: 65, CBA-AU: 73.89, TLS-AU: 5.36, 1-HK: 93, WES-AU: 42.77, AGL-AU: 18.29, 1128-HK: 11.1, CTX-AU: 32.5, ORI-AU: 15.3, CPU-AU: 10.11, HSO-AU: 2.72, 9433-JP: 3169, 8306-JP: 520.1, 7201-JP: 1000, 3382-JP: 4543, 9020-JP: 9824, 4503-JP: 1497, 7974-JP: 15155, 9531-JP: 485.1, 1605-JP: 888.2, 3407-JP: 759.

References:

Medvedev, Alexey and Vaucher, Benoit, Optimal Factor Investing: Good Portfolios Matter More than Bad Views (January 30, 2015). Available at SSRN: http://ssrn.com/abstract=2558062

http://www.gallup.com/poll/164063/besides-pay-women-satisfied-men-job-aspects.aspx

Disclosure Section

The information and opinions in Morgan Stanley Research were prepared by Morgan Stanley & Co. LLC, and/or Morgan Stanley C.T.V.M. S.A., and/or Morgan Stanley Mexico, Casa de Bolsa, S.A. de C.V., and/or Morgan Stanley Canada Limited. As used in this disclosure section, "Morgan Stanley" includes Morgan Stanley & Co. LLC, Morgan Stanley C.T.V.M. S.A., Morgan Stanley Mexico, Casa de Bolsa, S.A. de C.V., Morgan Stanley Canada Limited and their affiliates as necessary.
For important disclosures, stock price charts and equity rating histories regarding companies that are the subject of this report, please see the Morgan Stanley Research Disclosure Website at www.morganstanley.com/researchdisclosures, or contact your investment representative or Morgan Stanley Research at 1585 Broadway, (Attention: Research Management), New York, NY, 10036 USA.
For valuation methodology and risks associated with any recommendation, rating or price target referenced in this research report, please contact the Client Support Team as follows: US/Canada +1 800 303-2495; Hong Kong +852 2848-5999; Latin America +1 718 754-5444 (U.S.); London +44 (0)20-7425-8169; Singapore +65 6834-6860; Sydney +61 (0)2-9770-1505; Tokyo +81 (0)3-6836-9000. Alternatively you may contact your investment representative or Morgan Stanley Research at 1585 Broadway, (Attention: Research Management), New York, NY 10036 USA.

Analyst Certification

The following analysts hereby certify that their views about the companies and their securities discussed in this report are accurately expressed and that they have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report: Jessica Alsford, CFA; Charles Clavel; Lin Lin; Chandrama Naha; Adam S. Parker, Ph.D.; Eva T Zlotnicka.
Unless otherwise stated, the individuals listed on the cover page of this report are research analysts.

Global Research Conflict Management Policy

Morgan Stanley Research has been published in accordance with our conflict management policy, which is available at www.morganstanley.com/institutional/research/conflictpolicies.

Important US Regulatory Disclosures on Subject Companies

The equity research analysts or strategists principally responsible for the preparation of Morgan Stanley Research have received compensation based upon various factors, including quality of research, investor client feedback, stock picking, competitive factors, firm revenues and overall investment banking revenues.
Morgan Stanley and its affiliates do business that relates to companies/instruments covered in Morgan Stanley Research, including market making, providing liquidity, fund management, commercial banking, extension of credit, investment services and investment banking. Morgan Stanley sells to and buys from customers the securities/instruments of companies covered in Morgan Stanley Research on a principal basis. Morgan Stanley may have a position in the debt of the Company or instruments discussed in this report. Morgan Stanley trades or may trade as principal in the debt securities (or in related derivatives) that are the subject of the debt research report.
Certain disclosures listed above are also for compliance with applicable regulations in non-US jurisdictions.

STOCK RATINGS

Morgan Stanley uses a relative rating system using terms such as Overweight, Equal-weight, Not-Rated or Underweight (see definitions below). Morgan Stanley does not assign ratings of Buy, Hold or Sell to the stocks we cover. Overweight, Equal-weight, Not-Rated and Underweight are not the equivalent of buy, hold and sell. Investors should carefully read the definitions of all ratings used in Morgan Stanley Research. In addition, since Morgan Stanley Research contains more complete information concerning the analyst's views, investors should carefully read Morgan Stanley Research, in its entirety, and not infer the contents from the rating alone. In any case, ratings (or research) should not be used or relied upon as investment advice. An investor's decision to buy or sell a stock should depend on individual circumstances (such as the investor's existing holdings) and other considerations.

Global Stock Ratings Distribution

(as of April 30, 2016)
The Stock Ratings described below apply to Morgan Stanley's Fundamental Equity Research and do not apply to Debt Research produced by the Firm. For disclosure purposes only (in accordance with NASD and NYSE requirements), we include the category headings of Buy, Hold, and Sell alongside our ratings of Overweight, Equal-weight, Not-Rated and Underweight. Morgan Stanley does not assign ratings of Buy, Hold or Sell to the stocks we cover. Overweight, Equal-weight, Not-Rated and Underweight are not the equivalent of buy, hold, and sell but represent recommended relative weightings (see definitions below). To satisfy regulatory requirements, we correspond Overweight, our most positive stock rating, with a buy recommendation; we correspond Equal-weight and Not-Rated to hold and Underweight to sell recommendations, respectively.

	COVERAGE UNIVERSE		INVESTMENT BANKING CLIENTS (IBC)		
STOCK RATING CATEGORY	COUNT	% OF TOTAL	COUNT	% OF TOTAL IBC	% OF RATING CATEGORY
Overweight/Buy	**1202**	**36%**	**302**	**42%**	**25%**
Equal-weight/Hold	**1411**	**42%**	**326**	**45%**	**23%**
Not-Rated/Hold	**78**	**2%**	**7**	**1%**	**9%**
Underweight/Sell	**682**	**20%**	**91**	**13%**	**13%**
TOTAL	**3,373**		**726**		

Data include common stock and ADRs currently assigned ratings. Investment Banking Clients are companies from whom Morgan Stanley received investment banking compensation in the last 12 months.

Analyst Stock Ratings

Overweight (O). The stock's total return is expected to exceed the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.
Equal-weight (E). The stock's total return is expected to be in line with the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.
Not-Rated (NR). Currently the analyst does not have adequate conviction about the stock's total return relative to the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.
Underweight (U). The stock's total return is expected to be below the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.
Unless otherwise specified, the time frame for price targets included in Morgan Stanley Research is 12 to 18 months.

Analyst Industry Views

Attractive (A): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be attractive vs. the relevant broad market benchmark, as indicated below.
In-Line (I): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be in line with the relevant broad market benchmark, as indicated below.
Cautious (C): The analyst views the performance of his or her industry coverage universe over the next 12-18 months with caution vs. the relevant broad market benchmark, as indicated below.
Benchmarks for each region are as follows: North America - S&P 500; Latin America - relevant MSCI country index or MSCI Latin America Index; Europe - MSCI Europe; Japan - TOPIX; Asia - relevant MSCI country index or MSCI sub-regional index or MSCI AC Asia Pacific ex Japan Index.

Important Disclosures for Morgan Stanley Smith Barney LLC Customers

Important disclosures regarding the relationship between the companies that are the subject of Morgan Stanley Research and Morgan Stanley Smith Barney LLC or Morgan Stanley or any of their affiliates, are available on the Morgan Stanley Wealth Management disclosure website at www.morganstanley.com/online/researchdisclosures. For Morgan Stanley specific disclosures, you may refer to www.morganstanley.com/researchdisclosures.
Each Morgan Stanley Equity Research report is reviewed and approved on behalf of Morgan Stanley Smith Barney LLC. This review and approval is conducted by the same person who reviews the Equity Research report on behalf of Morgan Stanley. This could create a conflict of interest.

Other Important Disclosures

Morgan Stanley is not acting as a municipal advisor and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act.
Morgan Stanley produces an equity research product called a "Tactical Idea." Views contained in a "Tactical Idea" on a particular stock may be contrary to the recommendations or views expressed in research on the same stock. This may be the result of differing time horizons, methodologies, market events, or other factors. For all research available on a particular stock, please contact your sales representative or go to Matrix at http://www.morganstanley.com/matrix.
Morgan Stanley Research is provided to our clients through our proprietary research portal on Matrix and also distributed electronically by Morgan Stanley to clients. Certain, but not all, Morgan Stanley Research products are also made available to clients through third-party vendors or redistributed to clients through alternate electronic means as a convenience. For access to all available Morgan Stanley Research, please contact your sales representative or go to Matrix at http://www.morganstanley.com/matrix.
Any access and/or use of Morgan Stanley Research is subject to Morgan Stanley's Terms of Use (http://www.morganstanley.com/terms.html). By accessing and/or using Morgan Stanley Research, you are indicating that you have read and agree to be bound by our Terms of Use (http://www.morganstanley.com/terms.html). In addition you consent to Morgan Stanley processing your personal data and using cookies in accordance with our Privacy Policy and our Global Cookies Policy (http://www.morganstanley.com/privacy_pledge.html), including for the purposes of setting your preferences and to collect readership data so that we can deliver better and more personalized service and products to you. To find out more information about how Morgan Stanley processes personal data, how we use cookies and how to reject cookies see our Privacy Policy and our Global Cookies Policy (http://www.morganstanley.com/privacy_pledge.html).
If you do not agree to our Terms of Use and/or if you do not wish to provide your consent to Morgan Stanley processing your personal data or using cookies please do not access our research.
Morgan Stanley Research does not provide individually tailored investment advice. Morgan Stanley Research has been prepared without regard to the circumstances and objectives of those who receive it. Morgan Stanley recommends that investors independently evaluate particular investments and strategies, and encourages investors to seek the advice of a financial adviser. The appropriateness of an investment or strategy will depend on an investor's circumstances and objectives. The securities, instruments, or strategies discussed in Morgan Stanley Research may not be suitable for all investors, and certain investors may not be eligible to purchase or participate in some or all of them. Morgan Stanley Research is not an offer to buy or sell or the solicitation of an offer to buy or sell any security/instrument or to participate in any particular trading strategy. The value of and income from your investments may vary because of changes in interest rates, foreign exchange rates, default rates, prepayment rates, securities/instruments prices, market indexes, operational or financial conditions of companies or other factors. There may be time limitations on the exercise of options or other rights in securities/instruments transactions. Past performance is not necessarily a guide to future performance. Estimates of future performance are based on assumptions that may not be realized. If provided, and unless otherwise stated, the closing price on the cover page is that of the primary exchange for the subject company's securities/instruments.
The fixed income research analysts, strategists or economists principally responsible for the preparation of Morgan Stanley Research have received compensation based upon various factors, including quality, accuracy and value of research, firm profitability or revenues (which include fixed income trading and capital markets profitability or revenues), client feedback and competitive factors. Fixed Income Research analysts', strategists' or economists' compensation is not linked to investment banking or capital markets transactions performed by Morgan Stanley or the profitability or revenues of particular trading desks.
The "Important US Regulatory Disclosures on Subject Companies" section in Morgan Stanley Research lists all companies mentioned where Morgan Stanley owns 1% or more of a class of common equity securities of the companies. For all other companies mentioned in Morgan Stanley Research, Morgan Stanley may have an investment of less than 1% in securities/instruments or derivatives of securities/instruments of companies and may trade them in ways different from those discussed in Morgan Stanley Research. Employees of Morgan Stanley not involved in the preparation of Morgan Stanley Research may have investments in securities/instruments or derivatives of securities/instruments of companies mentioned and may trade them in ways different from those discussed in Morgan Stanley Research. Derivatives may be issued by Morgan Stanley or associated persons.
With the exception of information regarding Morgan Stanley, Morgan Stanley Research is based on public information. Morgan Stanley makes every effort to use reliable, comprehensive information, but we make no representation that it is accurate or complete. We have no obligation to tell you when opinions or information in Morgan Stanley Research change apart from when we intend to discontinue equity research coverage of a subject company. Facts and views presented in Morgan Stanley Research have not been reviewed by, and may not reflect information known to, professionals in other Morgan Stanley business areas, including investment banking personnel.
Morgan Stanley Research personnel may participate in company events such as site visits and are generally prohibited from accepting payment by the company of associated expenses unless pre-approved by authorized members of Research management.
Morgan Stanley may make investment decisions that are inconsistent with the recommendations or views in this report.
To our readers in Taiwan: Information on securities/instruments that trade in Taiwan is distributed by Morgan Stanley Taiwan Limited ("MSTL"). Such information is for your reference only. The reader should independently evaluate the investment risks and is solely responsible for their investment decisions. Morgan Stanley Research may not be distributed to the public media or quoted or used by the public media without the express written consent of Morgan Stanley. Information on securities/instruments that do not trade in Taiwan is for informational purposes only and is not to be construed as a recommendation or a solicitation to trade in such securities/instruments. MSTL may not execute transactions for clients in these securities/instruments. To our readers in Hong Kong: Information is distributed in Hong Kong by and on behalf of, and is attributable to, Morgan Stanley Asia Limited as part of its regulated activities in Hong Kong. If you have any queries concerning Morgan Stanley Research, please contact our Hong Kong sales representatives.
Morgan Stanley is not incorporated under PRC law and the research in relation to this report is conducted outside the PRC. Morgan Stanley Research does not constitute an offer to sell or the solicitation of an offer to buy any securities in the PRC. PRC investors shall have the relevant qualifications to invest in such securities and shall be responsible for obtaining all relevant approvals, licenses, verifications and/or registrations from the relevant governmental authorities themselves. Neither this report nor any part of it is intended as, or shall constitute, provision of any consultancy or advisory service of securities investment as defined under PRC law. Such information is provided for your reference only.

Morgan Stanley Research is disseminated in Brazil by Morgan Stanley C.T.V.M. S.A.; in Mexico by Morgan Stanley México, Casa de Bolsa, S.A. de C.V which is regulated by Comision Nacional Bancaria y de Valores. Paseo de los Tamarindos 90, Torre 1, Col. Bosques de las Lomas Floor 29, 05120 Mexico City; in Japan by Morgan Stanley MUFG Securities Co., Ltd. and, for Commodities related research reports only, Morgan Stanley Capital Group Japan Co., Ltd; in Hong Kong by Morgan Stanley Asia Limited (which accepts responsibility for its contents) and by Bank Morgan Stanley AG, Hong Kong Branch; in Singapore by Morgan Stanley Asia (Singapore) Pte. (Registration number 199206298Z) and/or Morgan Stanley Asia (Singapore) Securities Pte Ltd (Registration number 200008434H), regulated by the Monetary Authority of Singapore (which accepts legal responsibility for its contents and should be contacted with respect to any matters arising from, or in connection with, Morgan Stanley Research) and by Bank Morgan Stanley AG, Singapore Branch (Registration number T11FC0207F); in Australia to "wholesale clients" within the meaning of the Australian Corporations Act by Morgan Stanley Australia Limited A.B.N. 67 003 734 576, holder of Australian financial services license No. 233742, which accepts responsibility for its contents; in Australia to "wholesale clients" and "retail clients" within the meaning of the Australian Corporations Act by Morgan Stanley Wealth Management Australia Pty Ltd (A.B.N. 19 009 145 555, holder of Australian financial services license No. 240813, which accepts responsibility for its contents; in Korea by Morgan Stanley & Co International plc, Seoul Branch; in India by Morgan Stanley India Company Private Limited; in Indonesia by PT Morgan Stanley Asia Indonesia; in Canada by Morgan Stanley Canada Limited, which has approved of and takes responsibility for its contents in Canada; in Germany by Morgan Stanley Bank AG, Frankfurt am Main and Morgan Stanley Private Wealth Management Limited, Niederlassung Deutschland, regulated by Bundesanstalt fuer Finanzdienstleistungsaufsicht (BaFin); in Spain by Morgan Stanley, S.V., S.A., a Morgan Stanley group company, which is supervised by the Spanish Securities Markets Commission (CNMV) and states that Morgan Stanley Research has been written and distributed in accordance with the rules of conduct applicable to financial research as established under Spanish regulations; in the US by Morgan Stanley & Co. LLC, which accepts responsibility for its contents. Morgan Stanley & Co. International plc, authorized by the Prudential Regulatory Authority and regulated by the Financial Conduct Authority and the Prudential Regulatory Authority, disseminates in the UK research that it has prepared, and approves solely for the purposes of section 21 of the Financial Services and Markets Act 2000, research which has been prepared by any of its affiliates. RMB Morgan Stanley (Proprietary) Limited is a member of the JSE Limited and regulated by the Financial Services Board in South Africa. RMB Morgan Stanley (Proprietary) Limited is a joint venture owned equally by Morgan Stanley International Holdings Inc. and RMB Investment Advisory (Proprietary) Limited, which is wholly owned by FirstRand Limited. The information in Morgan Stanley Research is being disseminated by Morgan Stanley Saudi Arabia, regulated by the Capital Market Authority in the Kingdom of Saudi Arabia , and is directed at Sophisticated investors only.
The information in Morgan Stanley Research is being communicated by Morgan Stanley & Co. International plc (DIFC Branch), regulated by the Dubai Financial Services Authority (the DFSA), and is directed at Professional Clients only, as defined by the DFSA. The financial products or financial services to which this research relates will only be made available to a customer who we are satisfied meets the regulatory criteria to be a Professional Client.
The information in Morgan Stanley Research is being communicated by Morgan Stanley & Co. International plc (QFC Branch), regulated by the Qatar Financial Centre Regulatory Authority (the QFCRA), and is directed at business customers and market counterparties only and is not intended for Retail Customers as defined by the QFCRA.
As required by the Capital Markets Board of Turkey, investment information, comments and recommendations stated here, are not within the scope of investment advisory activity. Investment advisory service is provided exclusively to persons based on their risk and income preferences by the authorized firms. Comments and recommendations stated here are general in nature. These opinions may not fit to your financial status, risk and return preferences. For this reason, to make an investment decision by relying solely to this information stated here may not bring about outcomes that fit your expectations.
The trademarks and service marks contained in Morgan Stanley Research are the property of their respective owners. Third-party data providers make no warranties or representations relating to the accuracy, completeness, or timeliness of the data they provide and shall not have liability for any damages relating to such data. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and S&P.
Morgan Stanley Research, or any portion thereof may not be reprinted, sold or redistributed without the written consent of Morgan Stanley.
© 2016 Morgan Stanley