What's changed, what hasn't; potential 15% GDP boost

Since our initial Womenomics report in 1999, Japan now enjoys record female labor participation (71%) that surpasses the US and Europe, generous parental leave benefits, improved gender transparency, and labor reforms. Areas for improvement include: a dearth of female leaders, gender pay gaps, inflexible labor contracts, tax disincentives, insufficient caregiving capacity, and unconscious biases. However, the reward for persistence is potentially sizeable. Specifically, we estimate that closing the gender employment gap could lift Japan's GDP by 10%, and in a "blue-sky scenario" where the ratio of female vs. male working hours rises to the OECD average, the GDP boost could expand further to 15%.

No time to waste: Recommendations

Suggested government policies include: more flexible labor contracts, gender pay gap disclosures, tax reforms, parliamentary gender quotas, promotion of female entrepreneurship, and looser immigration rules. For corporations: proactive career management, more flexible work environments, performance-based evaluations, gender target-setting, and male diversity champions. Society should dispel Womenomics myths, avoid gender role stereotypes in the media, and promote more women in STEM. Fortunately, tailwinds such as ESG investing and shifting millennial male attitudes should further advance Japan's diversity agenda.

Kathy Matsui

+81 3 6437-9950 kathy.matsui@gs.com Goldman Sachs Japan Co., Ltd.

Hiromi Suzuki

+81 3 6437-9955 hiromi.suzuki@gs.com Goldman Sachs Japan Co., Ltd.

Kazunori Tatebe

+81 3 6437-9898 kazunori.tatebe@gs.com Goldman Sachs Japan Co., Ltd.

Investors should consider this report as only a single factor in making their investment decision. For Reg AC certification and other important disclosures, see the Disclosure Appendix, or go to www.gs.com/research/hedge.html.

Table of Contents

Executive summary: Womenomics is working, but still more to do	
Why Womenomics? The economic and business case	4
Progress since 1999	12
Areas for improvement	20
No time to waste: Recommendations for government, corporations, society	31
Tailwinds: ESG and shifting millennial attitudes	42
Disclosure Appendix	47

Note: The following is a redacted version of "Womenomics 5.0: 20 Years On" originally published April 16, 2019 [55pgs]. All company references in this note are for illustrative purposes only and should not be interpreted as investment recommendations.

Executive summary: Womenomics is working, but still more to do

Two decades have passed since we published our first report on *Women-omics: Buy the Female Economy*.¹ In 1999, the term "diversity" was neither part of the Japanese vernacular, nor a focus for the government, company managers, or society. Fast forward to 2019, and as a result of widespread labor shortages and a growing economy, there is a growing realization that **gender diversity in the workplace is no longer an option, but an economic and business imperative**.

To mark the 20th anniversary since our initial Womenomics research, we take stock of progress thus far, identify areas for improvement, and propose concrete recommendations.

1. What's the economic and business rationale behind Womenomics?

Updating our 2014 simulation whereby Japanese female labor participation rises to that of males, the potential boost to Japan's GDP could be 10%. However, under a "blue-sky" scenario, if we also assume the ratio of female vs. male working hours rises to the OECD average, the GDP boost could expand further to 15%. For businesses, Japanese listed firms with higher female manager ratios tend to deliver higher ROEs and sales growth.

2. What progress has been seen since 1999?

Over the past two decades, Japan has: a) seen its female labor participation ratio surge to a record 71%—surpassing the US and Europe, b) introduced one of the most generous parental leave benefits in the world, c) improved its gender transparency, and d) approved workstyle reforms that mandate overtime limits and equal pay for equal work.

3. What areas still need improvement?

Areas that still need work include: a) a dearth of female leaders in both the private/public sectors, b) persistent gender pay gaps, c) inflexible labor contracts, d) tax disincentives, e) insufficient caregiving capacity, and f) unconscious biases.

4. What should the government, corporations and society do now?

Policy recommendations include: more flexible labor contracts, gender pay gap disclosures, tax reforms, parliamentary gender quotas, promotion of female entrepreneurship, and looser immigration rules. For corporations, leaders should proactively manage women's careers, promote more flexible work environments, shift to performance-based evaluations, set gender diversity targets, and engage male diversity champions. Society should dispel Womenomics myths, shift gender role stereotypes in the media, and encourage more girls and women to pursue STEM education and careers.

See our August 13, 1999 strategy report, Womenomics: Buy the Female Economy.

The good news is that there are two important tailwinds today that were absent in 1999 that should help advance the Womenomics agenda over the next 20 years: namely, **the major expansion of ESG investing and shifting attitudes of the younger generation**.

Why Womenomics? The economic and business case

When we first broached the topic of Womenomics and the need for greater gender diversity in 1999, our argument was not social or cultural, but rather a simple economic one. After all, the three key determinants of economic growth for any country are: labor, capital, and productivity. Since Japan's population is shrinking, capital is finite, and productivity gains will take time, unless radical steps are taken quickly, we argued that the nation not only faced the risk of a further decline in its productivity and potential growth rate, but eventually, lower standards of living as well.

Demographic tsunami

Since our last **Womenomics** report in 2014, Japan's demographic situation has deteriorated even further.² Indeed, in 2018, the IMF warned that in the absence of meaningful structural reforms, demographic headwinds could cause the level of Japan's real GDP to decline by over 25% in 40 years relative to a baseline projection where productivity and population grow at their recent pace.³ How Japan chooses to manage its demographic headwinds over the next several years will serve as an important template (or not) for how other countries should cope with their own aging societies.

After peaking in 2008 at 128 mn, Japan's overall population had already shrunk by 1.5% to 126mn in 2018⁴, and based on government projections, is forecast to drop by 30% to just 88 mn by 2065.⁵ More importantly, **by 2055**, **Japan's workforce population is expected to shrink dramatically by 40%**, **from 75 mn in 2018 to 45 mn** (see Exhibit 1).

² See our May 6, 2014 strategy report, Womenomics 4.0: Time to Walk the Talk.

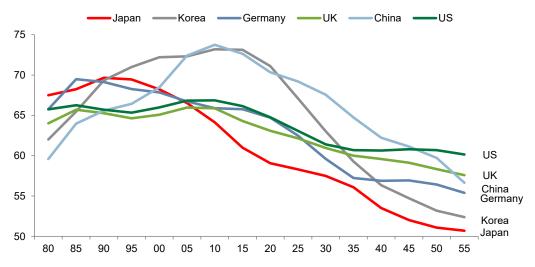
³ See Mariana Colacelli and Emilio Fernandez Corugedo's November 2018 IMF Working Paper, "Macroeconomic Effects of Japan's Demographics: Can Structural Reforms Reverse Them?"

⁴ Population Estimates, Ministry of Internal Affairs and Communications Statistics Bureau. As of October 2018.

⁵ Japan National Institute of Population and Social Security Research.

Exhibit 1: Japan workforce shrinking faster than other countries

Working age population proportion, aged 15-64, vs. total population, %



UN estimates after 2020, based on median estimates of mortality and birth rates. World Population Prospects, 2017 Revision, UN, June 2017.

Source: Japan Institute for Labour Policy and Training, UN

The government aims to boost the fertility rate to 1.8 by 2025, but as of 2018, it stood at just 1.4. **Japan remains one of the few major countries where the number of registered pets** (dogs and cats only: 18.7 mn as of 2015) **outnumbered children under the age of 15** (16.6 mn).⁶

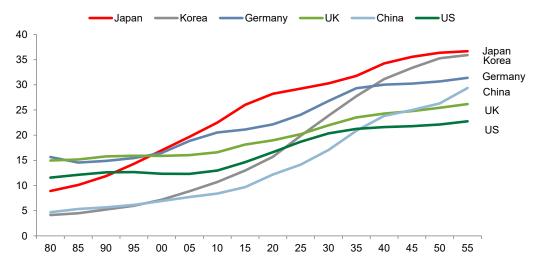
Besides shrinkage, Japan's population is also aging more rapidly than most other nations, with 28%⁷ of Japanese already in the elder-age cohort (65 years and older), and by 2055, this ratio is projected to rise to 37%. (see Exhibit 2). Japan's old-age dependency ratio (number of elder persons supported by one active worker) will rise to around 75% by 2050—the highest of any nation globally—meaning that eventually, each Japanese worker will need to support 1.3 elderly persons. This will pose even more serious challenges to the nation's fiscal debt sustainability.

⁶ Japan Pet Food Association.

⁷ Provisional estimates by Ministry of Internal Affairs and Communications, as of Mar. 1, 2019.

Exhibit 2: Japan is aging faster than other nations

Ratio of population over the age of 65, %

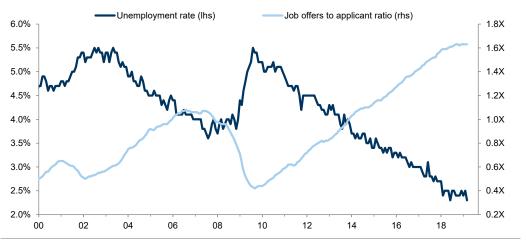


UN estimates after 2020, based on median estimates of mortality and birth rates. World Population Prospects, 2017 Revision, UN, June 2017.

Source: Japan Institute for Labour Policy and Training, UN

Consequently, Japan's labor market has become extremely tight, resulting in the unemployment rate sinking to a quarter-century low of 2.3% (Feb. 2019) and the job offers-to-applicants ratio reaching a record 1.6X—meaning there are 60% more jobs available than Japanese seeking work (see Exhibit 3). Unsurprisingly, labor-intensive industries such as security services, construction, and transportation are facing the most acute shortages (see Exhibit 4).

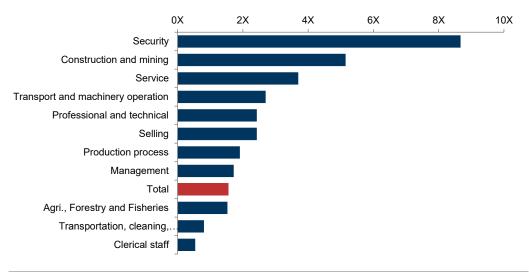
Exhibit 3: Japan's uber-tight job market As of February 2019



Source: MHLW

Exhibit 4: Labor shortages across many sectors

Effective offers to applicant ratios (including part-time), as of January 2019



Source: MHLW

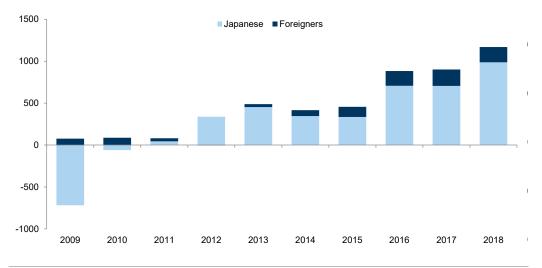
Relief from foreigners?

To provide some relief from labor shortages, Japan has seen an influx of foreign workers in recent years, and our economists calculated that foreign workers accounted for as much as 15% of the growth in employees during 2018 (182,000).

vs. 1.2 mn) (see Exhibit 5).8 The main sources of these workers are technical trainees as well as foreign students studying in Japanese universities (where student visas allow up to 28 hours/week for employment).

Exhibit 5: Foreigners accounted for 15% of growth in employees in 2018, sourced mainly from technical trainees and foreign students

Increase in the number of employees, YOY, thousands



Source: MHLW, MOJ

⁸ See Tomohiro Ota, Naohiko Baba, and Yuriko Tanaka's July 13, 2018 *Japan Economics Analyst: Spotlight on Immigration (2): What could change for Japan's economy and jobs market?*

Although foreigners have provided some relief, ongoing job shortages recently prompted the government to approve legislation which allows longer-duration work visas (max. 5 years) for up to **345,000 foreign nationals in five specified industries such as caregiving, construction, hospitality, shipbuilding, and agriculture.** This new visa program started April 1, 2019 and will last for the next five years. While this should ease some of the shortages, we doubt it can fill the entire supply gap.

Therefore, continuing to expand female employment must remain a top priority for the Japanese government and society.

Record female labor participation

When we published our first Womenomics report in 1999, Japan's female labor participation rate stood at just 56%—one of the lowest in the developed world. Since then, however, **the percentage has risen sharply to nearly 71% (as of Feb. 2019), overtaking the US (66%) and the Eurozone (62%)** (see Exhibit 6). Growth in the number of working women has been particularly pronounced during the past six years of Abenomics, where the number of employed females surged by more than 3 mn from 26.4 mn in 2012 to 29.7 mn in 2018.

Exhibit 6: Japan's female labor participation rate has surpassed the US and Eurozone



Source: OECD

Economic case: Potential GDP boosts of 10%, 15%

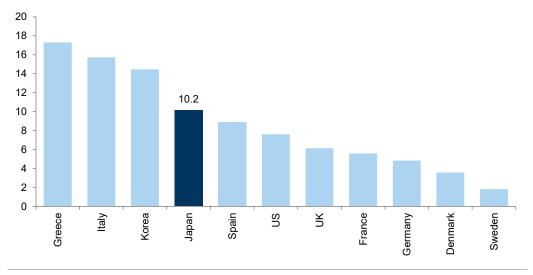
As we have argued in our previous Womenomics reports, the potential dividends from closing the gender employment gap for Japan are potentially massive. If Japan's labor participation rates for females (67% as of 2017) converged to that of males (83%)⁹ this would add 5.8 mn more employees to Japan's workforce. Since more workers generally means more income, we estimate **the potential positive impact on Japan's GDP to be 10%** (see Exhibit 7). Given that the gender employment gap has narrowed vs. 2014,

⁹ Female employment rate defined as the percentage of women working outside the home vs. female workforce between ages 15-64.

the potential GDP boost is somewhat smaller than our previous estimate, but nonetheless, **Japan remains one of the largest potential beneficiaries of closing the gender employment gap in the developed world**.

Exhibit 7: Closing the gender employment gap could boost Japan's GDP by 10%

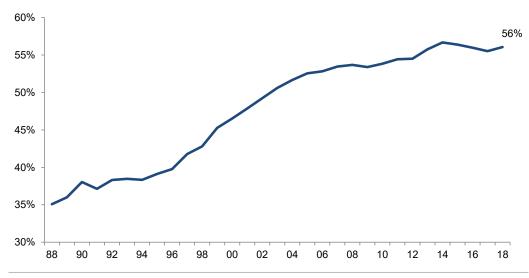
Potential increase in GDP levels assuming female employment rates rose to that of males, % 2017



Source: OECD, FactSet, data compiled by Goldman Sachs Global Investment Research

Some observers contend that since Japanese female labor participation is already at a record high, the scope for further gains from Womenomics is limited. However, **since** the majority of working women (56%) are engaged in part-time rather than full-time employment (see Exhibit 8), we believe the boost to Japan's economy could be even larger if more women assumed full-time positions or worked longer part-time hours.

Exhibit 8: Majority of Japanese working women are employed in part-time as opposed to full-time work

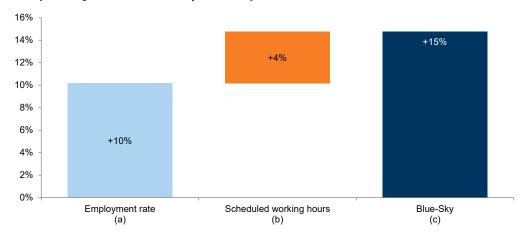


Source: JIL

Blue-sky scenario: Potential 15% GDP boost

Beyond closing Japan's gender employment gap, what if we also imagine a shift in the composition of female jobs whereby more women work in full-time roles (or longer hours than part-time)? As of 2017, the ratio of monthly regular working hours (excluding overtime) of Japanese women vs. men was 81% (118 vs. 145), while the OECD average was 85%. If we assume Japan's ratio eventually rises to the OECD average, Japan could enjoy an added GDP boost of 4%. In other words, under a "blue-sky" scenario, Japan's GDP could rise by as much as 15% (see Exhibit 9). 10

Exhibit 9: "Blue-sky" scenario: Closing the gender employment gap and raising the ratio of female vs. male monthly working hours could boost Japan's GDP by 15%



Source: Goldman Sachs Global Investment Research

Business case

Besides the potential macroeconomic boost from higher female labor participation, there are also significant potential benefits at the micro, or company level, as well. For instance, based on data for 297 Japanese listed firms that disclosed their female manager (*bucho*) statistics during June 2018-April 2019,¹¹ those that ranked in the highest group in terms of female manager ratios (>15%) boasted the highest (>6%) 5-year average sales growth, as well as the highest 3-year average ROEs (>9%, FY2010-FY2012), while firms in the lowest group had very low or negative average ROEs (see Exhibit 10).

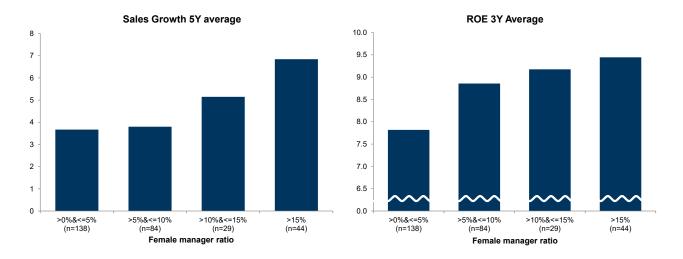
18 April 2019 10

_

¹⁰ Calculations based on 2017 data for monthly regular (excluding overtime) working hours for women vs. men in Japan and the rest of the OECD. Japan's ratio is 81%, and the OECD average is 84.8%.

¹¹ Source: Nikkei Valuesearch.

Exhibit 10: Japanese firms with the highest ratios of female managers post higher sales growth and ROEs %



Source: Nikkei Valuesearch, QUICK, FactSet, data compiled by Goldman Sachs Global Investment Research

Positive correlation between diverse leadership and corporate performance

There are numerous global studies by organizations such as Catalyst and others demonstrating how diverse leadership is positively correlated with corporate performance.¹² For example, a 2017 McKinsey study of 300 global companies found that those firms with the most women on their executive committees enjoyed 47% higher average ROE than those with none, and 55% higher EBIT margins (see Exhibit 11)¹³

Furthermore, Boston Consulting Group's 2018 survey, *How and Where Diversity Drives Financial Performance*, of more than 1700 companies in 8 countries found that **firms** with above-average "total diversity" (measured as the average of six dimensions of diversity: migration, industry, career path, gender, education, age), had on average 19% point higher innovation revenues and 9% points higher EBIT margins.¹⁴

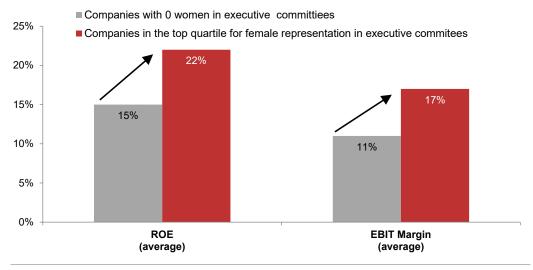
¹² One of the earliest studies was conducted by Catalyst, see Nancy M. Carter and Harvey M. Wagner's 2011 report, *The Bottom Line: Corporate Performance and Women's Representation on Boards (2004-2008).*

See McKinsey's 2017 report, 'Women Matter: Time to Accelerate: Ten Years of Insights into Gender Diversity.'

 $^{^{14}}$ See Rocio Lorenzo and Martin Reeves' Jan. 30, 2018 report, 'How and Where Diversity Drives Financial Performance.'

Exhibit 11: Positive correlation between diverse leadership and business performance

Gap between companies with high vs. zero female leadership representation, 300 companies in 10 countries, 2007-2009



Source: McKinsey.

Progress since 1999

When we published our initial Womenomics report two decades ago, there was little awareness about the topic of diversity. However, momentum accelerated after PM Shinzo Abe's second term began in 2013.

Unleashing the potential of Womenomics is an absolute must if Japan's growth is to continue... Womenomics offers a solution with its core tenet that a country that hires and promotes more women grows economically, and no less importantly, demographically as well. (Prime Minister Shinzo Abe: "Unleashing the Power of 'Womenomics", Wall Street Journal, September 25, 2013). 15

One of the most impactful changes the Abe administration made was to **shift the context for diversity away from a human rights or social issue to an economic and business imperative**. Declaring "Abenomics is Womenomics" helped shift corporate managers' and societal attitudes to the critical role gender diversity can play in driving growth.¹⁶

Abenomics' Womenomics goals

The Abe government's initial KPIs of the Womenomics agenda released in January 2014 (in his so-called "Davos Promise" keynote speech¹⁷) included:

¹⁵ Shinzo Abe: "Unleasing the Power of 'Womenomics'" in Wall Street Journal Opinion, September 25, 2013 (https://www.wsj.com/articles/shinzo-abe-unleashing-the-power-of-8216womenomics8217-1380149475)

¹⁶ "Opening Speech by Prime Minister Shinzo Abe at the World Assembly for Women (WAW!), 2015."

Prime Minister Shinzo Abe's keynote address at the World Economic Forum Annual Meeting, January 22, 2014.

- 1. Increasing the female labor participation rate between the ages of 25-44 from 68% in 2012 to 77% by 2020
- 2. Normalizing the "M-curve" by raising the percentage of women returning to work after their first child from 38% in 2010 to 55% by 2020
- 3. Targeting 30% female representation in leadership positions across Japanese society by 2020
- 4. Expanding childcare capacity, with the aim of eliminating children on daycare waitlists by 2017
- 5. Lifting the percentage of fathers who take paternity leave from 2.6% in 2011 to 13% by 2020

Subsequent to this agenda, the government added other policy goals, including:

- □ Augmenting parental leave benefits
- □ Improving gender diversity transparency
- □ Work-style reforms

Exhibit 12 summarizes the progress we have seen in each of these areas, and the remainder of this section explains each item in more detail. The bottom line is that **while** Japan is still far from reaching its targets on female leadership representation, headway has been made in other areas.

Exhibit 12: Abe government's Womenomics policy goals: Progress report card

Progress report card of Womenomics proposals		
0	Raise female labor participation rates	Boost Japan's low female labor participation rate (record 71% as of Feb. 2019, vs. 63% in 2013); more than 3 mn additional women are working vs. 2012
	Normalize the "M-curve"	Raise the percentage of women returning to work after their first child from 38% in 2010 to 55% by 2020 (currently 53%); lift the female labor participation rate between the ages of 25-44 from 68% in 2012 to 77% by 2020 (now: 74%, and new target: 80% by 2022)
X	Female leadership representation	Target 30% female representation in leadership positions across Japanese society by 2020
	Expand childcare capacity	Expand childcare capacity with the aim of eliminating children on daycare waitlists by 2020
	Lift paternity leave uptake ratios	Increase the percentage of fathers who take paternity leave from 2.6% in 2011 to 13% by 2020 $$
0	Augment parental leave policies	By 1999, one year of paid maternity leave was made available to both parents, and by 2014, the government allowed for two-thirds of earnings to be replaced during the first six months of parental leave
0	Improve gender diversity transparency	2015 legislation requires public and private organizations to disclose their gender diversity conditions and action plans
0	Work-style reforms	Labor reforms introduced to limit overtime hours and mandate equal pay for equal work

Note: "0"=Completed; triangle=In progress; "X"=Slow progress

Source: Goldman Sachs Global Investment Research

More women working than ever before (0)

Overall female labor participation has risen significantly during the past six years to a record 71% (vs. 63% in 2013), and there has been progress in normalizing Japan's ubiquitous "M-curve" (see Exhibit 14). Thanks to a rise in the ratio of mothers returning to work after their first child from 40% between 2005-2009 to 53% between 2010-2014, the labor participation ratio for 25-44 year-old women rose to 74% in 2017, approaching the government's original 2020 target of 77%. Subsequently, the government established a new target of 80% by 2022.

Exhibit 13: Ratio of mothers returning to work earlier has risen to 53% from 40%

Employment before and after birth of first child

Source: Cabinet Office

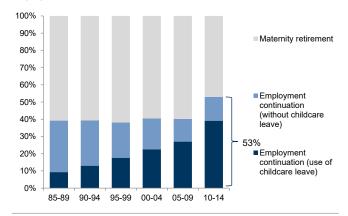
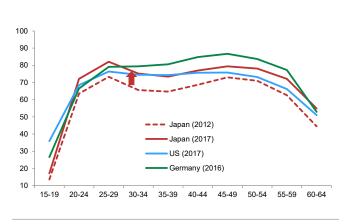


Exhibit 14: Helping to normalize Japan's "M-curve"



Source: CAO

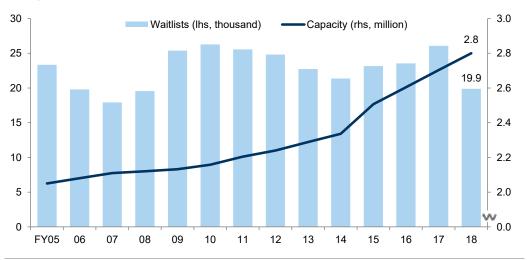
Expanded daycare capacity (🛦)

One of the challenges facing many working parents in Japan has been the shortage of daycare capacity. In 2012, the number of children on daycare waitlists was 24,825, and the Abe government set an initial target of eliminating all children on waitlists by 2017 by committing to create capacity for an additional 400,000 children. While the government actually surpassed this goal by creating 530,000 spots by 2017, the problem was that demand grew much faster than expected, leaving waitlisted children. Therefore, the government subsequently announced plans to create additional childcare capacity for 320,000 children with the aim of eliminating waitlisted children by the end of FY2020.

While there is still more work to be done, there has been progress. **Total daycare** capacity has expanded 27% (from 2.2 mn in 2012 to 2.8 mn as of 2018), and the number of waitlisted children has fallen to an 11-year low of roughly 19,900 (see Exhibit 15).

Exhibit 15: Daycare capacity has expanded 27% since 2012 and number of waitlisted children has fallen to an 11-year low

As of April 1, 2018

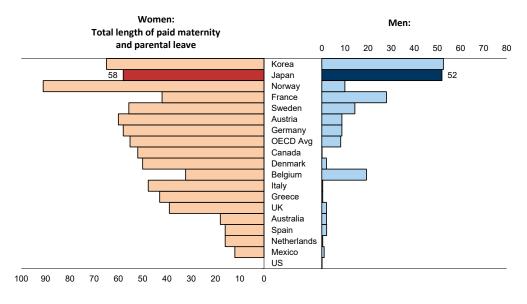


Source: MHLW

Augmented parental leave benefits (0)

In order to encourage parents to have more children, the government augmented parental leave policies, and as a result, **Japan's parental leave benefits are now among the most generous in the world** (see Exhibit 16). For instance, Japanese mothers and fathers are eligible for up to 1 year of parental leave, and during the first six months they can earn up to 67% of their existing salary (excluding bonuses), and thereafter, they are eligible for 50% of their salary for the rest of their leave. Since social insurance premiums are waived during childcare leave, the actual amount paid is around 80% of pre-leave take home pay.

Exhibit 16: Japan now has one of the most generous parental leave policies globally 2016, Number of weeks



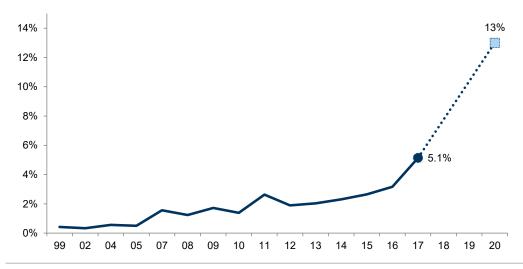
Ranked from highest to lowest based on combined length of women and men leave periods

Source: OECD, data compiled by Goldman Sachs Global Investment Research

Boosting paternity leave ratios (▲)

Another major Womenomics goal has been raising the percentage of fathers who take paternity leave. Despite having one of the most generous paternity leave policies among developed nations, many Japanese fathers still take only a few days off or none at all. While the paternity leave uptake ratio has risen from less than 2% in 2012 to 5% in 2017, there is still a long way to go to reach the government's goal of 13% by 2020. However, since many firms are now incorporating paternity leave targets into their diversity agendas, we expect the ratio will continue to climb.

Exhibit 17: Ratio of fathers who take paternity leave has risen, but still a long way to go to reach 13% goal by 2020



Source: MHLW, Cabinet Office

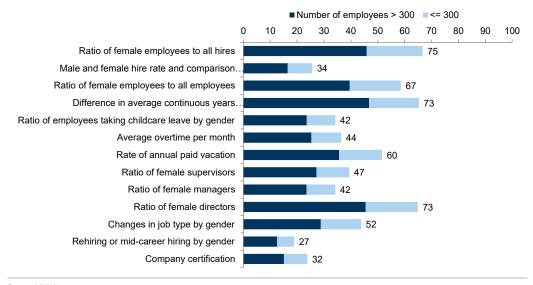
Transparency: Mieru-ka (0)

Through enactment of the landmark 2015 legislation, "**Act on Promotion of Women's Participation and Advancement in the Workplace"**, which took effect in April 2016, any organization (public or private) with more than 300 employees is **obliged to disclose gender diversity-related data and publish "diversity action plans"**. These plans should contain information on female participation in their workplaces as well as numerical targets (i.e., female manager ratio targets). As of December 2017, 99.7% of private sector corporations with more than 300 employees had submitted their action plans. Thereafter, smaller firms also began disclosing their diversity data, and by item, the highest disclosure ratios were for "ratio of female employees", "ratio of female directors", and "difference in average continuous years of employment" (see Exhibit 18).

Based on these disclosures, the Ministry of Health, Labor and Welfare (MHLW) established a certification system called *ERUBOSHI* to recognize companies that stand out for their initiatives to promote female participation, such as high standards for retention and promotion of female employees. ¹⁸ As of April 2019, 815 companies were awarded *ERUBOSHI* certification, and sectors with relatively high ratios of ERUBOSHI-recognized firms include: News communication, Finance and insurance, Petroleum products, Academic research service, and Utilities (see Exhibits 19 and 20).

Exhibit 18: Before moving the diversity needle, you need to know where the needle lies—Gender disclosures

% of disclosure, as of June 2018



Source: MHLW

¹⁸ Eruboshi means "L-Star" for "Lady, Labor and Laudable")

Goldman Sachs

Exhibit 19: Number of companies with "Eruboshi" certification

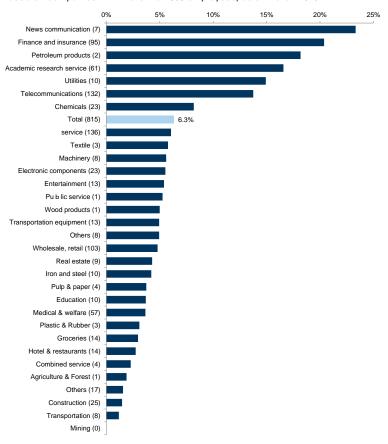
Number of companies



Source: MHLW

Exhibit 20: Sector ranking of ratio of "Eruboshi" certified companies

Based on companies with more than 300 employees, as of March 2019



Numbers in parentheses represent the number of companies certified as "Eruboshi ('L-Star')" $\,$

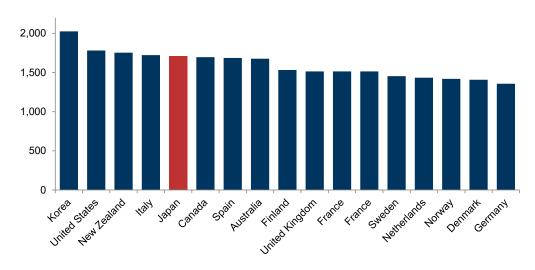
Source: Company data, MHLW, data compiled by Goldman Sachs Global Investment Research

Work-style reforms (0)

In order to improve overall Japanese work styles and boost labor participation rates, **the government approved legislation on work-style reforms, which took effect on April 1, 2019**. Since Japanese work hours are among the longest in the developed world (see Exhibit 21), large firms must now comply with a **new overtime hour restriction** (effectively 100 hours per month), and non-compliance is subject to penalties. The purpose is not only to improve work-life balance, but to boost overall labor productivity as well.

Moreover, to improve the treatment of part-timers, employers must also comply with new "Equal Pay for Equal Work" regulations from April 2020 for large companies (and April 2021 for smaller firms). This new law prohibits unreasonable treatment of non-regular (fixed-term) employees, and obliges employers to offer the same level of basic pay to both regular and non-regular workers if they engage in the same work and possess equal levels of skills, experience and performance.

Exhibit 21: Japan ranks among the highest in terms of hours worked annually Average annual hours worked per person in employment (2017)



Source: OECD

Areas for improvement

While there has been encouraging progress over the past two decades, there is still much room for improvement, in our view. Indeed, in the World Economic Forum's latest (2018) Global Gender Gap index, Japan ranked 110 out of 149 countries. However, much of this can be attributed to its low ranks in terms of economic participation (#117) and political empowerment (#125), while it ranked highly on 'health and survival,' (#41) and 'educational attainment' (#65).

Specifically, we see scope for improvement in:

- 1. Dearth of female leaders
- 2. Gender pay gaps
- 3. Inflexible labor contracts
- 4. Tax disincentives
- 5. Insufficient caregiving capacity
- 6. Unconscious biases and gender role stereotypes

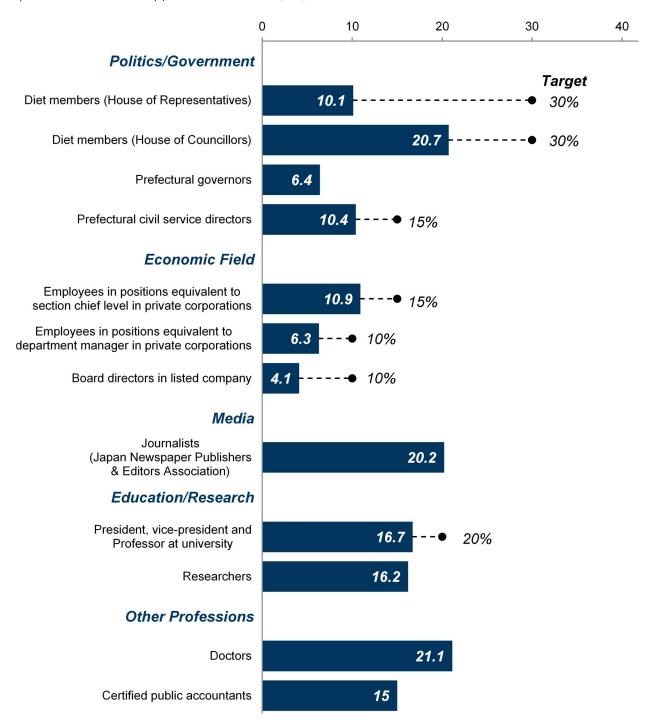
Dearth of female leaders

Despite the absolute progress Japan has made during the past 20 years, the nation's diversity still ranks low globally, particularly in terms of leadership representation.

As part of the government's "Fourth Basic Plan for Gender Equality", numerical targets were set in 2016 in order to boost the representation of women in leadership positions. While the government's initial target was 30% for all sectors, it revised this to more modest goals in 2015 (specifically, 10% for private sector managers, and 15% for prefectural civil service directors). Exhibit 22 contains the targets for various sectors and the current levels. Many critics scoff at these targets because they seem overly ambitious, but in our view, having aspirational targets is better than having none at all.

Exhibit 22: Japanese female leadership representation: Work in progress

Proportion of women in leadership positions in various fields (2017)

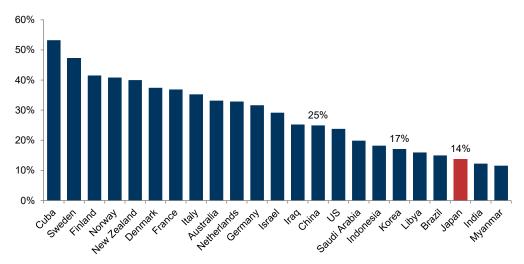


Source: Cabinet Office, data compiled by Goldman Sachs Global Investment Research

Under-represented in politics

Japan's female representation in Parliament has been chronically low. **Merely 14% of Diet seats** (10% of the Lower House and 21% of the Upper House) **are filled by female lawmakers, causing Japan to rank 158th among 193 countries** surveyed by the Inter-Parliamentary Union, which is lower than other Asian nations such as China (25%) and Korea (17%) and even lower than Middle Eastern countries such as Saudi Arabia (20%) and Libya (17%). Despite the recent passage of a new law that urges political parties to make every effort to field more female candidates, it is non-binding and there are no penalties for inaction.

Exhibit 23: Japan's female parliamentary representation is extremely low % of women in Parliament or Congress



Data has been compiled by the Inter-Parliamentary Union on the basis of information provided by National Parliaments by 1st January 2019. 193 countries are classified by descending order of the percentage of women in the lower or single House.

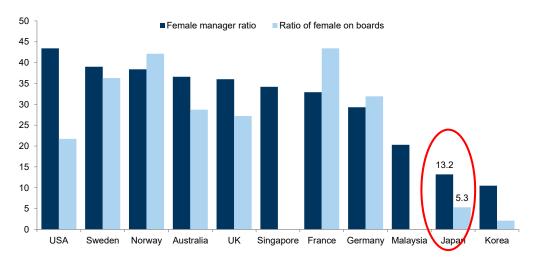
Source: Inter-Parliamentary Union

Dearth of female managers and directors

Women are also persistently under-represented in the leadership of private sector firms. For example, the ratio of female managers, defined as section chiefs (*kacho*) or above, at large listed Japanese firms stands at just 13%—around half that of similar ratios in other advanced economies (see Exhibit 24). The situation is even worse for female representation on boards, where the percentage is merely 5%—one fourth that of the US and one-fifth that of Europe.

Exhibit 24: Still a dearth of Japanese females in leadership/managerial roles

Female manager ratio (2017 or latest) and female board representation of the largest listed companies (2017), %

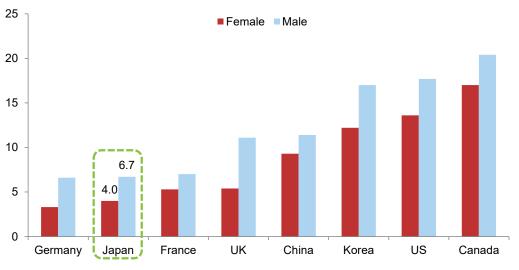


Female manager ratios: 2017 for Japan, Sweden, and Norway; 2015 for Korea and Singapore; 2013 for US; rest as of 2016.

Source: Ministry of Internal Affairs and Communications, ILO, OECD, Cabinet Office

Given the rigid nature of Japanese corporate culture, one would think that many Japanese women seeking managerial responsibility might pursue entrepreneurship instead. However, according to the 2018 Global Entrepreneurship Monitor, Japan's "Total early-stage Entrepreneurial Activity (TEA)" rate for females stood at just 4%-well below other Asian economies such as Korea (12%) and China (9%) (see Exhibit 25).19

Exhibit 25: Japanese female entrepreneurship: Still a long way to go Gender Distribution of Total early-stage Entrepreneurial Activity (TEA), % of adult population



2018/2019 Global Report

Source: Global Entrepreneurship Monitor

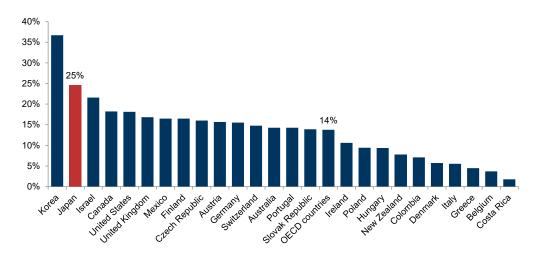
18 April 2019 23

¹⁹ See Global Entrepreneurship Monitor Consortium's 2018 Global Entrepreneurship Monitor, https://www.gemconsortium.org/

Gender pay gaps

Persistent pay inequity often discourages Japanese women from participating more fully in the workforce. Although pay gaps are universal, **Japanese women earn an average of 25% less than Japanese men—the largest gap in the G7 and the second-largest in the OECD** (see Exhibit 26). One reason for this gap is that women account for the majority (70%) of part-time or non-regular workers, but we believe traditional evaluation processes that emphasize seniority and time over performance and productivity play a role as well.

Exhibit 26: Gender wage gap—Japan has the largest in the G7 and the second-largest within the OECD 2016, Gender wage gap (median)



Decile ratios of gross earnings

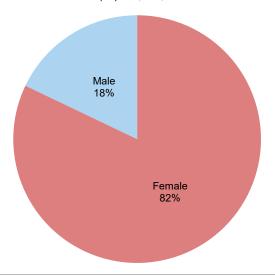
Source: OECD

Inflexible labor contracts and dual-track career paths

One factor that slows the path to leadership for Japanese women is the traditional dual-track employment model of "career track" (sogo-shoku) and "non-career" (ippan-shoku) roles which is still common among larger firms. Career-track positions typically offer higher salaries and include significant investment in training and development during the course of a career. Non-career roles, on the other hand, usually come with limited training, minimal career upside and low job security. This is a major reason behind Japan's low labor productivity (especially in non-manufacturing), in our view.

Since women account for the majority (82%) of non-career track roles upon entering the workforce (see Exhibit 27), this rigid dual-track system leads to significant gaps in promotion opportunities and wages longer-term.

Exhibit 27: Women comprise 82% of non-career track roles Female ratio of newly hired non-career track employees (2014)



Source: Cabinet Office, Japan Institute for Labour Policy and Training

Furthermore, current Japanese law on full-time labor contracts with no fixed expiration is highly inflexible. Hiring a person mid-career on the same terms as a regular employee (sei-shain) disrupts seniority-based employment policies. Consequently, many companies are reluctant to hire persons—men or women—mid-career as regular employees. Therefore, most women who return to the workforce take up part-time or fixed-term contracts, and employers have little incentive to invest in their training for the future. Consequently, females typically earn far lower salaries than their male counterparts, and this helps explain Japan's very high gender pay gap and low labor productivity levels overall.

Tax disincentives

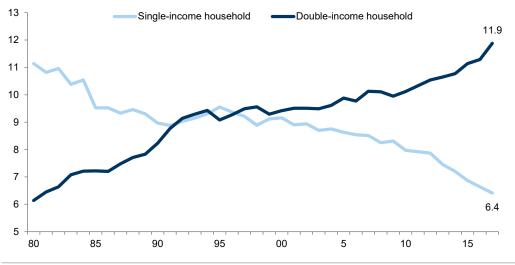
One of the structural obstacles to greater Japanese female employment is the **spousal deduction tax system that has historically discouraged many women from participating fully in the workforce**. Under the current system, a married person can claim a spousal deduction of ¥380,000 if his or her spouse earns an annual income of less than ¥1.03 mn (US\$9,364). That deduction is lost completely, however, if the spouse earns more than that amount. Moreover, as long as the spouse's annual income remains below ¥1.3 mn, he/she can still claim a national pension without paying any premiums. Such income thresholds have forced many Japanese women to become poorly paid part-timers or discouraged them from working outside the home completely.

Japan's social security system also presents a deterrent for women wanting to return to work. Currently, dependents (spouse and children) are covered for healthcare and the national pension by premiums deducted from a worker's salary at a cost no higher than the premium a single worker pays or that each member of a married working couple pays. This law essentially penalizes working couples, single persons, and self-employed

persons, since all must pay the same premium as a married worker once their income exceeds the threshold, but without the additional benefits to spouses.²⁰

The current tax and social security systems were introduced in the 1960s, when Japan's typical household structure was comprised predominantly of single-income earners, but since **there are now twice as many double-income households as single-income ones** (see Exhibit 28), an overhaul of the tax and social security systems looks long overdue.

Exhibit 28: Twice as many double-income households as single-income ones Households with married couples, millions



Source: MHLW

Insufficient caregiving capacity

While the Japanese government has made progress in expanding daycare capacity, the child/elder-caregiving system continues to rely almost entirely on the domestic labor force. As a result of a shortage of domestic caregivers, however, the nation's leading caregiving agencies have been forced to slow their pace of expansion.²¹

We believe Japan should look to other country examples where domestic caregivers have been supplemented by foreign caregivers. It is no coincidence that in countries such as Singapore and Hong Kong, where the ratio of foreign domestic helpers vs. female population is relatively high due to more open immigration laws, they also enjoy relatively high female labor participation rates (Exhibit 29).

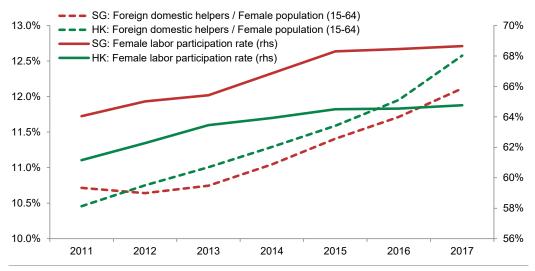
18 April 2019 26

.

²⁰ See American Chamber of Commerce in Japan's (ACCJ) Women in Business Committee's 2016 report, Untapped Potential.

²¹ The combined number of new daycare centers planned by six major caregiving agencies in FY2019 is expected to be 30% lower than in FY2018; Nikkei Shinbun, March 31, 2019.

Exhibit 29: Rising presence of foreign domestic helpers vs. female labor participation coincides with higher female labor participation rates in Singapore and Hong Kong



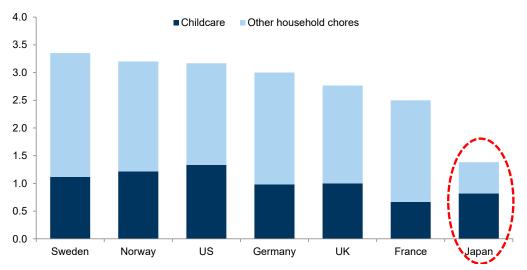
Source: Singapore's Ministry of Manpower, World Bank

Under current Japanese immigration rules, **Japanese citizens and permanent residents are legally prohibited from sponsoring or employing foreign domestic workers**. Only foreign executives are allowed to do so, and even then, multiple conditions must be met (such as the executive's visa status).

Given the surge in Japanese working women and the fact that Japanese fathers typically spend an average of less than 2 hours per day on household chores and child-rearing (see Exhibit 30), it is no surprise that many Japanese women feel obliged to quit working once they have children.

Exhibit 30: Where's Papa?

Average no. of hours per day fathers spend on household chores and childcare



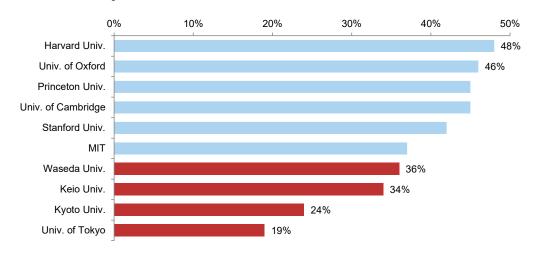
Gender Equality Bureau, Cabinet Office (2016), Eurostat How Europeans Spend Their Time: Everyday Life of Women and Men (2004).

Source: Cabinet Office, data compiled by Goldman Sachs Global Investment Research

Unconscious biases and gender role stereotypes

One of the key barriers to greater gender equality in Japan is society itself. Due to stereotypes perpetuated by the media, schools and society at large, young children grow up heavily influenced by traditional expectations of gender roles. One of the more worrisome trends is that while more Japanese women attend university than Japanese men (59% of women have university degrees vs. 52% of men aged 25-34 years), women are very under-represented in the nation's top universities, with **females representing less than 25% of the undergraduate student body of top-ranked universities such as University of Tokyo (19%), Kyoto University (24%)** vs. Harvard University (48%) and Oxford University (46%) (see Exhibit 31).²²

Exhibit 31: Japanese females a distinct minority within its top universitiesRatio of female undergraduate students



THE University Impact Rankings 2019

Source: Times Higher Education, University of Tokyo

One of the reasons is that public university entrance exams require math and science, and the gap between Japanese boys' and girls' math and science scores in the OECD's PISA (Programme for International Student Assessment) test for 15-year olds is larger than in many other advanced countries (see Exhibit 32).²³ Moreover, in the same PISA survey, Japan's ratio of 15-year old girls who want to study science is half that of boys (see Exhibit 33). This helps to explain why **Japan has the lowest ratio of female researchers and scientists in the OECD** (see Exhibit 34).

18 April 2019 28

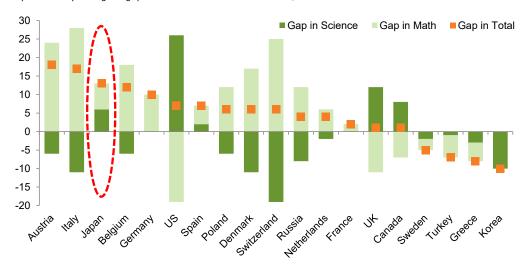
__

²² Gender inequality in Japanese society was the subject of a speech at the University of Tokyo's undergraduate matriculation ceremony held on April 12, 2019 by Professor Emeritus Chizuko Ueno.

²³ See McKinsey's April 2018 study, "The Power of Parity: Advancing Women's Equality in Asia Pacific."

Exhibit 32: Japan's gender gap in math and science scores is large

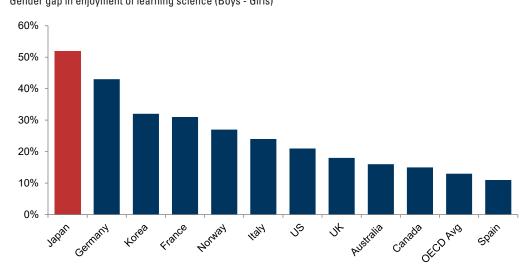
15-year old boys' vs. girls' gap in total math and science scores, 2015



Programme for International Student Assessment, 2015

Source: OECD, data compiled by Goldman Sachs Global Investment Research

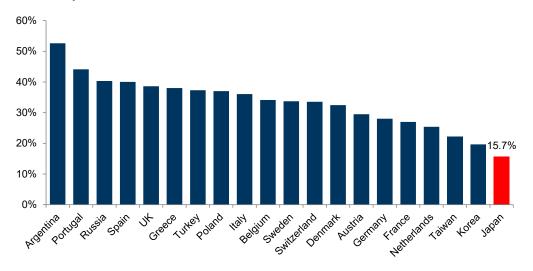
Exhibit 33: Number of Japanese girls who want to study science is half that of boys Gender gap in enjoyment of learning science (Boys - Girls)



Programme for International Student Assessment, 2015

Source: OECD

Exhibit 34: Japan's ratio of female researchers/scientists ranks the lowest in the OECD



Japan as of 2017, Korea as of 2016, others as of 2015

Source: OECD, Ministry of Education, Institute for Science, Technology and Academic Policy , data compiled by Goldman Sachs Global Investment Research

These statistics suggest that there may be deeply-rooted issues at home and society at large, i.e., females may not be encouraged by their parents and teachers to aim for top-ranked universities or to pursue STEM (science, technology, engineering, mathematics) fields. To rectify this imbalance, some Japanese universities are stepping up their diversity recruiting efforts, but we believe much of the onus for driving such change lies inside the home—with the unconscious biases of both mothers and fathers and how this is reflected in the upbringing of their children.

No time to waste: Recommendations for government, corporations, society

While there has been some visible progress on improving Japan's gender diversity over the past two decades, we see there is still much work to be done. As observed in other countries, gender diversity tends to make the most progress when a holistic approach involving government, corporations and society is involved.

Learning from best practices around the world, we have compiled a list of concrete recommendations. While by no means an exhaustive list, we believe that since Japan's demographic challenges are increasing, the country should not delay in making changes.

Recommendations for government, corporations and society

Government

- 1. More flexible labor contracts
- 2. Gender pay gap disclosures
- 3. Rectify tax disincentives
- 4. Parliamentary gender quotas
- 5. Promote female entrepreneurship
- 6. Loosen immigration rules to allow for more foreign caregivers
- 7. Tighten gender diversity disclosure requirements

Corporations

- 1. Leadership commitment and proactively managing women's careers
- 2. Promote more flexible work environments
- 3. Performance-based evaluations
- 4. Gender diversity target-setting
- 5. Engage male champions

Society

- 1. Dispel Womenomics myths
- 2. Media: Correct gender role stereotypes
- 3. Education: Encourage more girls and women in STEM

Government policies

While the government has made progress in some of the recommendations we published in our 2014 report such as requiring gender-related disclosures, we see many other areas where it can further influence the behavior of corporations and society.

1. More flexible labor contracts: Eliminating labor market duality

One of the biggest obstacles preventing more Japanese women working (especially in a full-time capacity) is the rigidity of labor contracts and labor market duality, whereby labor contracts are either full-time (regular) or part-time (non-regular). One way to encourage more women to return to the workforce as regular employees and to reduce the hiring risks for employers is to **introduce more flexible labor contracts**. While the government has created a new intermediate-type "limited regular worker" (*gentei sei-shain*) contract to provide a more attractive alternative for both employers and employees, legal uncertainties surrounding severance conditions have resulted in slow uptake of this new contract type.

The American Chamber of Commerce in Japan, has long advocated the creation of a more flexible "regular employee" contract that would allow companies and employees to conclude labor contracts of indeterminate duration, as long as the employee is compensated in case of dismissal with a pre-contracted amount of severance pay based on his/her total years of service. Such contracts would increase incentives for hiring women looking to enter or return to the workforce and by doing so, would help narrow the gender pay gap as well.²⁴

2. Gender pay gap disclosures

Pay equity is a challenging topic in almost every country, but since Japan's gender pay gap is one of the OECD's largest at 25%, there is considerable scope to narrow it to at least the OECD average of 14%.

Non-regular workers have risen from 15% of Japan's workforce to nearly 40%, and they typically earn roughly 60% of the pay of regular employees. Since women account for as much as 70% of all non-regular workers, the new "Equal Pay for Equal Work" legislation that takes effect starting April 2020 should deliver material wage gains for females over time, thereby boosting labor productivity.

However, since Japan's pay gap is so extreme, more radical and immediate action should be considered. One solution that some countries have adopted is **government-mandated reporting of gender pay discrepancies**. A recent empirical study published in the Harvard Business Review on the impact of mandatory wage transparency showed that **disclosing disparities in gender pay does in fact narrow the gender wage gap**.²⁵ It can also have other beneficial effects by (1) increasing the

²⁴ See the American Chamber of Commerce in *Japan Viewpoint, Add Flexibility to the Contract Law to Address Burgeoning Social Inequality While Spurring Economic Growth* (http://accj.or.jp/en/advocacy/viewpoints/).

²⁵ Gender Pay Gaps Shrink When Companies Are Required to Disclose Them, by Morten Bennedsen, Elena Simintzi, Margarita Tsoutsoura, and Daniel Wolfenzon, in the Harvard Business Review, January 23, 2019. This study was based on Denmark's wage statistics before and after the introduction of its 2006 legislation, 'Act on Gender Specific Pay Statistics.'

number of female hires, indicating that the supply pool of female employees increases as gender pay transparency improves, and (2) raising the number of females being promoted to more senior positions.

As in other countries, gender pay reporting makes many employers uncomfortable and will naturally encounter resistance, but since the Japanese government already requires gender diversity disclosures, the addition of gender pay gap reporting would be completely aligned with the goal of improving overall gender transparency and workplace equity.

3. Rectify tax disincentives

Current tax systems should be modified so they no longer discourage married women from participating fully in the workforce. The **elimination of institutional exemptions on spousal income in the tax and social security codes should help encourage more married women to seek higher-paying, full-time jobs**. Many other countries have already replaced "family income" taxation with "individual income" taxation, and reducing the tax burden for secondary earners can help boost female employment.

In addition, as the American Chamber of Commerce in Japan has recommended, the government should also consider offering **targeted tax incentives** for 1) promoting flexible work practices, 2) tax credits for companies and individuals for the costs of domestic caregiving support (childcare and eldercare), and 3) tax incentives to encourage recruitment and/or training of unemployed spouses.²⁶

4. Parliamentary gender quotas

Since the National Diet determines the policies that affect the lives of all people in Japan, it is unjustified that female political representation is so low. Clearly more radical steps must be taken to rectify this chronic imbalance, and Japan should consider **the introduction of temporary quotas for the Diet**. Many nations have parliamentary quotas, and while there may be backlash in Japan, we think it is necessary in order to design and implement policies that properly reflect the needs of Japan's entire society.

Korea has also suffered from under-representation of females in their political system, and it introduced a gender quota system in 2000 that requires 30% of candidates running for proportional representation seats to be female, and this target was subsequently raised to 50% in 2004. As a result, the ratio of female candidates more than doubled from 5.9% in 2000 to 14.7% by 2008. In addition, for single-seat constituencies, the government urged political parties to field at least 30% female candidates and to encourage this, the government established a special subsidy for political parties that followed this practice.

While just one example, Japan could consider similar types of quotas and incentives to boost the number of female political candidates and overall female political representation.

²⁶ See ACCJ Women in Business Committee's 2016 Untapped Potential.

5. Promote female entrepreneurship

Since it will take time for institutionalized corporate structures to change, promoting women-owned businesses can offer a more flexible and desirable career path for many Japanese women. SMEs account for over 99% of all enterprises in Japan and roughly 70% of all jobs, yet **the level of female entrepreneurship remains extremely low**.²⁷

In order to help promote entrepreneurship, the government implemented "Guidelines for Utilization of Public Procurement and Subsidies Towards the Promotion of Women's Advancement" in FY2016. When ministries screen companies during procurement processes, additional points are awarded to firms that promote work-life balance, such as companies that have been awarded *Eruboshi* certification.²⁸

While this is helpful, we believe the government can do much more to promote women entrepreneurs. A METI survey on female entrepreneurship showed that among the obstacles faced by women when starting their businesses, "lack of management know-how" and "access to credit" were among the biggest challenges. The government should consider more robust programs offering preferential treatment to women-owned businesses for government procurement, easier access to credit and low-interest loans, as well as mentorship and networking programs.

In the US, for example, the Women's Business Ownership Act of 1988 provided a basis for policies, programs and public/private sector initiatives aimed at supporting female entrepreneurship. This Act provided seed funding for women's business centers through an annual process by the Small Business Administration. Moreover, in 1994, the US Congress passed legislation that requires the federal government to award a minimum of 5% of all government-wide contracts to women-owned businesses.

6. Loosen immigration rules to allow for more foreign caregivers

The recent creation of a new "specified skills" work visa will permit the hiring of up to 345,000 foreign workers over the next five years in sectors including caregiving. Prior to this, in 2015, the government permitted the hiring of a limited number of foreign domestic helpers by Japanese citizens within five "Special Economic Zones" (including Tokyo and Osaka) as long as those helpers are employed by approved Japanese agencies.

Although these are positive steps in the right direction, caregiving labor shortages persist. As of 2016, Japan had 1.9 mn nursing care workers, but the Ministry of Health, Labor and Welfare estimates that this will need to rise by 550,000 to 2.45 mn by 2045, and at the current pace of nursing caregiver growth, a shortage of 337,000 caregivers is predicted within six years by the Ministry.

Japanese citizens and permanent residents are currently prohibited from sponsoring or hiring foreign domestic workers. While certain conditions could be applied such as limited-term work visas and requiring wages to be no lower than Japanese peers, there

²⁷ Defined as 'Total early-stage Entrepreneurial Activity (TEA) Rates' as % of adult female population. See Niels Bosma and Donna Kelley's Global Entrepreneurship Monitor 2018-2019 Global Report.

²⁸ See Cabinet Office's report, Women and Men in 2018.

should be further deregulation to allow Japanese citizens and permanent residents to sponsor/hire foreign domestic workers and caregivers. As witnessed in other countries, the additional supply of foreign caregivers could go a long way in filling the supply gap for childcare and much-needed elder care in Japan.

7. Tighten gender diversity disclosure requirements

We applaud the Japanese government for raising diversity transparency through the 2015 "Act on Promotion of Women's Participation and Advancement in the Workplace" which requires public and private organizations to disclose gender diversity-related data and publish diversity action plans. However, the problem is that there are no penalties for non-compliance, and since organizations have flexibility in determining what types of data to disclose, it is not standardized and therefore difficult to conduct cross-industry and cross-company comparisons.

We therefore recommend that for the private sector (especially listed firms), gender-related disclosures and target-setting should be both mandatory and standardized within corporate governance reports. At a minimum, listed companies should be required to disclose their ratios and targets for female managers and board directors. Such disclosures will naturally create 'healthy competition' for female talent among firms in the same industry, and be helpful for domestic and overseas investors who are increasingly focused on gender diversity in the context of ESG.

Corporations

With many industries facing acute labor shortages that will likely only worsen from here, the war for talent is set to intensify. On top of this, the new "Work-Style Reforms" capping overtime hours means that not only will employers face recruiting and retention challenges, but they can now only extract a limited number of hours from each individual employee. The key to survival, therefore, is to find ways to **boost productivity through investments in technology/automation, etc., as well as to hire the best quality talent available**.

Against this backdrop, Japan's private sector can offer greater leadership in promoting gender diversity in the following five areas:

1. Leadership commitment and proactively managing women's careers

In our numerous diversity discussions with Japanese corporations over the past 20 years, it is clear that one of the common denominators of those firms that have successfully "moved the diversity needle" are those that don't just talk about diversity, but continually make the business case and take concrete actions to create an environment where female and other diverse employees can maximize their full potential. Thereafter, companies need to create initiatives that deliberately prioritize gender diversity, including recruiting, retention and promotion.

At the more individual level, **business leaders also need to be more thoughtful and proactive about managing women's careers**. One practical suggestion is **unconscious bias training for managers** for issues ranging from differences in how

women vs. men react to performance reviews to how women vs. men respond to promotion opportunities (i.e., the "confidence gap" of women).

Left unchecked, unconscious biases can hurt business performance and can often result in talented and qualified women being passed over for important career-altering promotions by managers (both male and female). As one senior Japanese female executive explained:

While it's encouraging to see companies become more diversity-conscious, they need to be careful about becoming "overly female-friendly" (josei ni yasashi-sugiru).

She has observed many high-potential women placed in career tracks that are more administrative or "back-office" in nature, rather than in front-line production or sales positions. The unintended consequence is that by the time these women are eligible for important leadership promotions, many have not accumulated the necessary experience (jisseki) required for such roles.

To avoid falling into such a trap of becoming "too soft on women," leaders need to be just as tough on women as they are on men, by offering them similar stretch assignments and career opportunities. This is particularly crucial for women during the early stages of their careers before critical life events occur (such as childbirth), since it's harder to lure women back to work if they aren't sufficiently motivated before they leave.

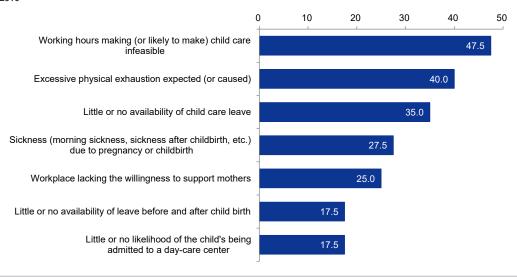
Another important global best practice that companies should consider is going beyond conventional mentorship programs towards **sponsorship**. Since sponsorship typically incorporates a higher degree of personal investment and accountability by sponsors, it usually results in more effective and individualized career management than simple mentorship.

2. Promote more flexible work environments

Reasons cited by Japanese mothers who off-ramp from their careers after giving birth are not limited to childcare availability or support for working mothers. For many, the inflexibility of working hours is cited the most (see Exhibit 35). Therefore, employers should promote more flexible work arrangements (including job-sharing and tele-commuting), and importantly, employees in flexible work arrangements should not be discriminated against in terms of career opportunities or compensation.

Exhibit 35: Reasons cited by Japanese mothers who quit working after giving birth despite a desire to continue working

2016



Source: MHLW

A useful case study is the UK's "Right to Request Flexible Working" legislation introduced in 2003 which empowers employees to ask for flexible scheduling (meaning hours of work and place of work), and ensures that employers consider these requests. The program has been highly successful, and while it was initially aimed at working parents, in 2014 the legislation was expanded to cover any employee with 26 weeks continuous service. Sweden and the Netherlands have similar laws granting employees the right to request more flexible work arrangements.

While many Japanese companies offer flexible work arrangements, few employees take advantage of them for fear that doing so will negatively impact their evaluations and career paths. Therefore, it is crucial that employers create an environment where flexible work styles are not only acceptable, but actively encouraged. It is also helpful to showcase individuals who have taken on flexible work arrangements and have been promoted to senior leadership positions.

3. Shifting from seniority to performance-based evaluations

One of the root causes of Japan's low female labor participation and low leadership representation is that evaluations at many traditional Japanese companies still tend to prioritize seniority and time over performance and output. This is also a key reason why Japan ranks near the top of the developed world in terms of longest number of hours worked annually and among the lowest in terms of the amount of time Japanese fathers spend on household chores and child-rearing.

While such ingrained practices may take a long time to change, we believe the intense competition for talent and urgent need for innovation is already forcing many Japanese firms to re-think their evaluation methodologies. Shifting towards more performance-based processes should not only drive higher productivity, but can boost motivation as well.

4. Gender diversity target-setting

In addition to government requirements for improved gender diversity-related disclosures from private sector firms, we believe **companies can also be more proactive in setting and disclosing their diversity goals and targets for recruitment, retention and promotion**. Furthermore, to ensure progress, senior executives should be held accountable for monitoring progress and reaching these goals.

Corporations should also proactively take the initiative to be more transparent about their diversity conditions and goals. One successful case in point is that of Philip Morris International (PMI) which, in 2019, became the first international company to be certified globally for equal pay by the independent EQUAL-SALARY Foundation.²⁹ The EQUAL-SALARY certification methodology verified that PMI pays all of its 77,000 employees, in more than 90 countries, equally for equal work, regardless of gender, through an extensive and thorough audit process involving external verification of all employees' salaries. Notably, Philip Morris Japan (PMJ) was the first company outside of Switzerland to obtain EQUAL-SALARY Certification in November 2016.

5. Engage male champions

It has been encouraging to see the emergence of many diversity-related organizations emerge in Japan over the past 20 years, including:

- Women Corporate Directors (WCD) Japan: The Japan chapter of WCD aims to promote more women on Japanese corporate boards (https://www.womencorporatedirectors.org/WCD/)
- **J-Win:** Japan Women's Innovative Network is an NPO that promotes gender diversity management, training and networking activities for women employed in the private sector (https://www.j-win0.jp/)
- Association of Women in Finance (AWF): A Tokyo-based organization that provides women in finance a forum to further their professional development, network and exchange information and meet like-minded women of all nationalities (https://awftokyo.com/)
- For Empowering Women (FEW): A collective of globally-minded English-speaking women who connect through powerful programming, intimate gatherings and a constant exchange of ideas (https://fewjapan.com/)

In addition to women pushing the diversity agenda, it is also critically important **to engage the majority, i.e., male leaders.** In 2014, under the leadership of then-Gender Equality Minister, Masako Mori, a "Group of Male Leaders Who Will Create a Society in which Women Shine" was launched, comprised of over 100 diversity leaders throughout corporate Japan. This group commits to 1) take actions on promoting diversity, 2) disrupt the status quo, and 3) expand the network of male leaders who will promote diversity. The initiative was modeled after Australia's "Male Champions for Change"—a

²⁹ See https://www.pmi.com/careers/equal-pay/

³⁰ See the Cabinet Office's website: http://www.gender.go.jp/policy/sokushin/male_leaders/

leadership group that brought the *Women Empowering Principles (WEPs)* to life through collaboration and innovative strategies.³¹

Another successful global initiative involving male leaders has been the "30% Clubs". The 30% Club was originally launched in the UK in 2010 by Helena Morrissey, the former CEO of Newton Investment Management, with the aim of reaching a minimum of 30% female representation on FTSE100 company boards. The organization attracted over 60 chairmen of leading UK firms and the purpose of the club is to 1) raise awareness among business leaders of the benefits of gender diversity, 2) inspire debate and discussion, and 3) support initiatives to build the pipeline of women in executive and non-executive roles. Since 2010, the initiative has proven very successful, as the number of women on FTSE-100 boards increased from 12.5% to 31% as of March 2019. Given the success of the 30% Club, a chapter is expected to be launched in Japan in the Spring of 2019.³²

Society

1. Dispel Womenomics myths

Beyond government policies and private sector initiatives, perhaps the toughest barrier to greater gender diversity is society itself. In our 2014 Womenomics report, we argued that more work was needed to dispel certain myths about Womenomics and gender diversity. Among these, we believe two myths are worth re-emphasizing, namely: (a) Japanese women tend to quit working after starting a family primarily due to "pull" factors, and (b) raising female labor participation will drive Japan's birth rate even lower.

Myth: Japanese women quit working only because of "pull" factors

In 2011, the Center for Work-Life Policy released a survey (based on 1,582 respondents) focused on the reasons Japanese women off-ramped more than women in other countries.³³ Notably, childcare and eldercare (i.e., "pull" factors) were *not* the primary explanations for the exodus of Japanese mothers from the workforce. For instance, only 32% of Japanese women off-ramped for childcare reasons, vs. 74% in the US (see Exhibit 36). In contrast, as many as 63% of Japanese working mothers quit due to "push" factors, i.e., job dissatisfaction and 49% because they felt stalled in their careers. This compares with comparable ratios of 26% and 16%, respectively, for American women.

The implication is that while policies addressing "pull" factors such as expanding childcare and eldercare services are necessary, they alone are not sufficient.

Reforms within organizations—especially proactive management of working mothers' careers—are also crucial to addressing the "push" factors. Many of these

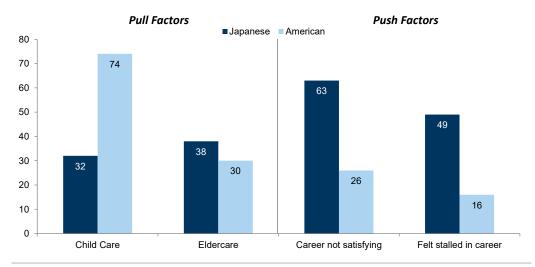
³¹ For more information, see the Male Champions of Change website: https://www.humanrights.gov.au/male-champions-change

https://30percentclub.org/about/chapters/japan

See Sylvia Ann Hewlett and Laura Sherbin's 'Off-Ramps and On-Ramps Japan: Keeping Talented Women on the Road to Success,' Center for Work-Life Policy, 2011.

factors are related not only to how women's career trajectories are managed, but also to the culture and level of diversity awareness inside organizations.

Exhibit 36: Japanese mothers cited "push" more than "pull" factors for leaving the workforce %



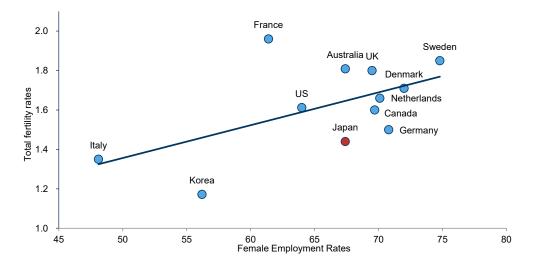
Source: Center for Work Life Policy

Myth: Higher female participation is negatively correlated with fertility rates

There is still a widely-held view that if more Japanese women work, the nation's already-low birth rate will fall even further, exacerbating the demographic headwinds. However, as we previously demonstrated, the empirical evidence contradicts this. Exhibit 37 plots female labor participation rates against birth rates for various countries, and there is a positive—not negative—correlation between the two, meaning that countries with more working women such as Sweden, Denmark, and the Netherlands, tend to have higher fertility rates and vice versa.

Moreover, a similar positive correlation holds true within Japan's 47 prefectures (see Exhibit 38).

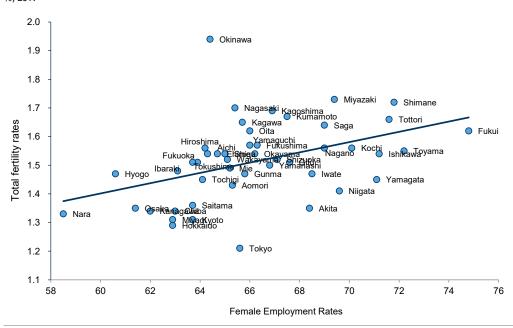
Exhibit 37: Female labor participation and fertility rates are positively, not negatively, correlated globally %, 2016



Female employment rates: as of 2017 for Japan, as of 2016 for the others.

Source: MHLW, OECD

Exhibit 38: Same is true inside Japan—Female labor participation and fertility rates for the 47 prefectures %, 2017



Source: MHLW

2. Media: Avoid gender role stereotypes

As in any other country, Japanese media is enormously influential in shaping societal perceptions about gender roles. In the Japanese government-sponsored 4th annual World Assembly for Women (WAW!) Summit in November 2017, the "Women in Media" roundtable highlighted that since women account for merely 5% of managers in Japan's media industry, and at the time the top five national newspapers had not yet disclosed gender diversity-related information, the media industry itself needed to take more proactive steps in promoting greater diversity.

The roundtable issued specific recommendations such as urging media companies to produce more content depicting working *parents* (as opposed to just working fathers), as well as more mindful usage of terms such as "sharing housework" as opposed to "helping with housework".

3. Education: Encourage more girls and women in STEM

Despite the fact that more Japanese women hold university degrees than men, Japanese women account for just 20% of computer science and 18% of engineering majors.

Since technology transformations are rapidly propelling the world toward a more knowledge- and digitally-based society, and women comprise a large share of the lower value-added occupations that may be vulnerable to future disruption, **more girls and women should be encouraged to pursue education and careers in STEM fields**.

Concrete steps that could be taken include: 1) showcasing female STEM role models such as science and technology entrepreneurs in schools and in the media, and 2) launch STEM mentorship programs in junior- and senior-high schools to help boost interest in science prior to university matriculation, and 3) in order to help women re-enter the workforce more easily, establish certification systems for STEM qualifications (similar to existing certification systems for legal, financial, accounting, and tax qualifications).

We note the 2018 revelation that Tokyo Medical University officials systematically lowered female applicants' entrance examination scores for more than a decade to ensure that more men became doctors³⁴ — the silver lining is that such situations are shining a spotlight of scrutiny on Japan's "dark shadows" of gender discrimination.

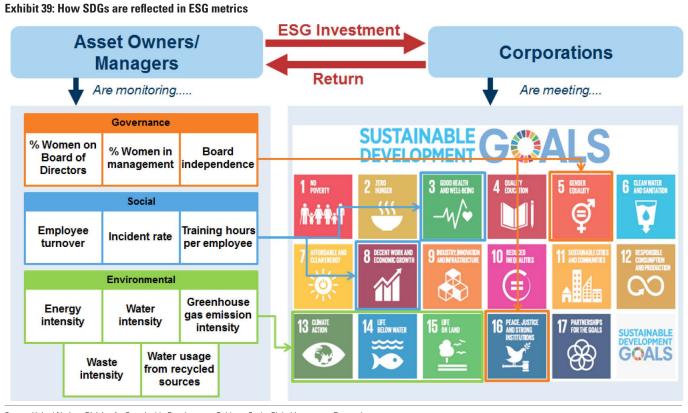
Tailwinds: ESG and shifting millennial attitudes

While the headwinds remain formidable, we remain in the "cup is half full" camp on the future of Womenomics, because—compared to 20 years ago—two critical tailwinds have emerged that should help promote gender diversity going forward: 1) the major expansion in ESG investing, and 2) shifting attitudes among younger-generation Japanese males.

³⁴ See August 3, 2018 New York Times, *Japanese Medical School Accused of Rigging Admissions to Keep Women Out.*

ESG tailwinds

In order to promote the United Nation's Sustainable Development Goals (SDGs) within the investment world, there has been a heightened focus on ESG (Environment, Social and Governance) metrics (see Exhibit 39).



Source: United Nations Division for Sustainable Development, Goldman Sachs Global Investment Research

According to the Global Sustainable Investment Alliance, sustainably invested assets across equity, fixed income, real estate and private equity globally totaled US\$30.7 tn of professionally-managed AUM in 2018, up 34% vs. 2016.³⁵ Japan was a particular standout, with dramatic growth in AUM of 307% since 2016, and with 23% CAGR growth in the number of signatories to the United Nation's PRI (Principles of Responsible Investing) since 2011 (see Exhibit 40).

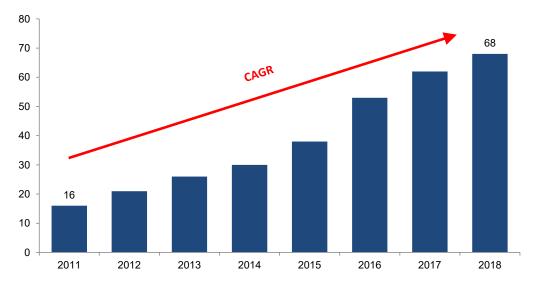
18 April 2019 43

-

³⁵ See Evan Tylendal, Richard Manley, and Derek Bingham's April 15, 2019 *GS Sustain Chart of the Week: Sizing the ESG market—growth is accelerating.*

Exhibit 40: ESG investment is expanding fast

Number of signatories by Japanese asset owners



Note: Signatories include asset owners, investment managers and service providers.

Source: UNPRI

Diversity metrics are included in "Governance" and "Social" scores, and investors are now carefully tracking metrics such as management and board diversity. As part of its Womenomics agenda, the Abe government has encouraged every Japanese company to appoint at least one female director, but this is an aspirational, rather than a binding, target.

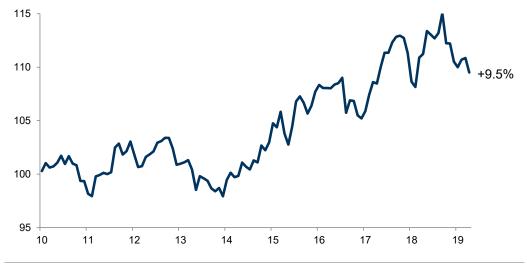
However, global proxy advisor, Glass-Lewis, recently revised its Japan voting guidelines so that from February 2019, for TOPIX Core 30 and Large 70 constituents (i.e., TOPIX 100), it will begin making recommendations against members of a board that do not have any incumbent or proposed female members.³⁶

In 2017, the world's largest pension fund—Government Pension Investment Fund (GPIF)—announced that it would be allocating ¥1 to towards three Japanese equity indices based on ESG factors, and one of these was the **MSCI Japan Empowering Women Index** (WIN).³⁷ The WIN index comprises companies whose gender diversity initiatives have been determined to encourage more women to enter or return to the workforce. Thus far, **the WIN index has outperformed the broader MSCI Japan index by 9.5% since 2010** (see Exhibit 41).

³⁶ http://www.glasslewis.com/wp-content/uploads/2017/12/2018-Guidelines-JAPAN.pdf

³⁷ https://www.gpif.go.jp/en/investment/pdf/ESG_indices_selected.pdf

Exhibit 41: MSCI Japan Women's Empowerment Index (WIN) has outperformed the market Indexed, relative to MSCI Japan index, Dec 30, 2010=100, as of Apr 8, 2019



Source: MSCI, QUICK

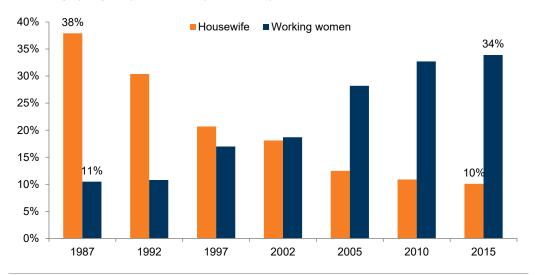
Shifting millennial male attitudes

Another important tailwind that should help advance gender diversity is the distinct shift in attitudes of younger Japanese towards work/life balance. For instance, in 1987, 38% of single men (aged 18-34 years) believed that his future spouse should be a full-time housewife, and only 11% should be a working mother. By 2005, however, the same survey showed a reversal, and as of 2015, 34% of men actually preferred their spouse to be a working mother, while only 10% wanted the spouse to stay at home (see Exhibit 42).

This suggests that attitudes of millennials and younger generations are already turning towards a positive direction, and the desire for greater work-life balance is no longer just for women, but for all of Japanese society.

Exhibit 42: Japanese millennial males are becoming more open to dual-career households

The role single young men prefer for their spouses (18-34 years-old)



Source: Japan National Institute of Population and Social Security Research.

Disclosure Appendix

Reg AC

We, Kathy Matsui, Hiromi Suzuki and Kazunori Tatebe, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

Unless otherwise stated, the individuals listed on the cover page of this report are analysts in Goldman Sachs' Global Investment Research division.

Disclosures

Regulatory disclosures

Disclosures required by United States laws and regulations

See company-specific regulatory disclosures above for any of the following disclosures required as to companies referred to in this report: manager or co-manager in a pending transaction; 1% or other ownership; compensation for certain services; types of client relationships; managed/co-managed public offerings in prior periods; directorships; for equity securities, market making and/or specialist role. Goldman Sachs trades or may trade as a principal in debt securities (or in related derivatives) of issuers discussed in this report.

The following are additional required disclosures: **Ownership and material conflicts of interest:** Goldman Sachs policy prohibits its analysts, professionals reporting to analysts and members of their households from owning securities of any company in the analyst's area of coverage. **Analyst compensation:** Analysts are paid in part based on the profitability of Goldman Sachs, which includes investment banking revenues. **Analyst as officer or director:** Goldman Sachs policy generally prohibits its analysts, persons reporting to analysts or members of their households from serving as an officer, director or advisor of any company in the analyst's area of coverage. **Non-U.S. Analysts:** Non-U.S. analysts may not be associated persons of Goldman Sachs & Co. LLC and therefore may not be subject to FINRA Rule 2241 or FINRA Rule 2242 restrictions on communications with subject company, public appearances and trading securities held by the analysts.

Additional disclosures required under the laws and regulations of jurisdictions other than the United States

The following disclosures are those required by the jurisdiction indicated, except to the extent already made above pursuant to United States laws and regulations. Australia: Goldman Sachs Australia Pty Ltd and its affiliates are not authorised deposit-taking institutions (as that term is defined in the Banking Act 1959 (Cth)) in Australia and do not provide banking services, nor carry on a banking business, in Australia. This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act, unless otherwise agreed by Goldman Sachs. In producing research reports, members of the Global Investment Research Division of Goldman Sachs Australia may attend site visits and other meetings hosted by the companies and other entities which are the subject of its research reports. In some instances the costs of such site visits or meetings may be met in part or in whole by the issuers concerned if Goldman Sachs Australia considers it is appropriate and reasonable in the specific circumstances relating to the site visit or meeting. To the extent that the contents of this document contains any financial product advice, it is general advice only and has been prepared by Goldman Sachs without taking into account a client's objectives, financial situation or needs. A client should, before acting on any such advice, consider the appropriateness of the advice having regard to the client's own objectives, financial situation and needs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests and a copy of Goldman Sachs' Australian Sell-Side Research Independence Policy Statement are available at: https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html. Brazil: Disclosure information in relation to CVM Instruction 598 is available at https://www.gs.com/worldwide/brazil/area/gir/index.html. Where applicable, the Brazil-registered analyst primarily responsible for the content of this research report, as defined in Article 20 of CVM Instruction 598, is the first author named at the beginning of this report, unless indicated otherwise at the end of the text. Canada: Goldman Sachs Canada Inc. is an affiliate of The Goldman Sachs Group Inc. and therefore is included in the company specific disclosures relating to Goldman Sachs (as defined above). Goldman Sachs Canada Inc. has approved of, and agreed to take responsibility for, this research report in Canada if and to the extent that Goldman Sachs Canada Inc. disseminates this research report to its clients. Hong Kong: Further information on the securities of covered companies referred to in this research may be obtained on request from Goldman Sachs (Asia) L.L.C. India: Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (India) Securities Private Limited, Research Analyst - SEBI Registration Number INH000001493, 951-A, Rational House, Appasaheb Marathe Marg, Prabhadevi, Mumbai 400 025, India, Corporate Identity Number U74140MH2006FTC160634, Phone +91 22 6616 9000, Fax +91 22 6616 9001. Goldman Sachs may beneficially own 1% or more of the securities (as such term is defined in clause 2 (h) the Indian Securities Contracts (Regulation) Act, 1956) of the subject company or companies referred to in this research report. Japan: See below. Korea: This research, and any access to it, is intended only for "professional investors" within the meaning of the Financial Services and Capital Markets Act, unless otherwise agreed by Goldman Sachs. Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C., Seoul Branch. New Zealand: Goldman Śachs New Zealand Limited and its affiliates are neither "registered banks" nor "deposit takers" (as defined in the Reserve Bank of New Zealand Act 1989) in New Zealand. This research, and any access to it, is intended for "wholesale clients" (as defined in the Financial Advisers Act 2008) unless otherwise agreed by Goldman Sachs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests is available at: https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html. Russia: Research reports distributed in the Russian Federation are not advertising as defined in the Russian legislation, but are information and analysis not having product promotion as their main purpose and do not provide appraisal within the meaning of the Russian legislation on appraisal activity. Research reports do not constitute a personalized investment recommendation as defined in Russian laws and regulations, are not addressed to a specific client, and are prepared without analyzing the financial circumstances, investment profiles or risk profiles of clients. Goldman Sachs assumes no responsibility for any investment decisions that may be taken by a client or any other person based on this research report. Singapore: Further information on the covered companies referred to in this research may be obtained from Goldman Sachs (Singapore) Pte. (Company Number: 198602165W). Taiwan: This material is for reference only and must not be reprinted without permission. Investors should carefully consider their own investment risk. Investment results are the responsibility of the individual investor. United Kingdom: Persons who would be categorized as retail clients in the United Kingdom, as such term is defined in the rules of the Financial Conduct Authority, should read this research in conjunction with prior Goldman Sachs research on the covered companies referred to herein and should refer to the risk warnings that have been sent to them by Goldman Sachs International. A copy of these risks warnings, and a glossary of certain financial terms used in this report, are available from Goldman Sachs International on request.

European Union: Disclosure information in relation to Article 6 (2) of the European Commission Delegated Regulation (EU) (2016/958) supplementing Regulation (EU) No 596/2014 of the European Parliament and of the Council with regard to regulatory technical standards for the technical arrangements for objective presentation of investment recommendations or other information recommending or suggesting an investment strategy and for disclosure of particular interests or indications of conflicts of interest is available at https://www.gs.com/disclosures/europeanpolicy.html which states the European Policy for Managing Conflicts of Interest in Connection with Investment Research.

Japan: Goldman Sachs Japan Co., Ltd. is a Financial Instrument Dealer registered with the Kanto Financial Bureau under registration number Kinsho 69, and a member of Japan Securities Dealers Association, Financial Futures Association of Japan and Type II Financial Instruments Firms Association. Sales and purchase of equities are subject to commission pre-determined with clients plus consumption tax. See company-specific disclosures as to

any applicable disclosures required by Japanese stock exchanges, the Japanese Securities Dealers Association or the Japanese Securities Finance Company.

Global product; distributing entities

The Global Investment Research Division of Goldman Sachs produces and distributes research products for clients of Goldman Sachs on a global basis. Analysts based in Goldman Sachs offices around the world produce research on industries and companies, and research on macroeconomics, currencies, commodities and portfolio strategy. This research is disseminated in Australia by Goldman Sachs Australia Pty Ltd (ABN 21 006 797 897); in Brazil by Goldman Sachs do Brasil Corretora de Títulos e Valores Mobiliários S.A.; Ombudsman Goldman Sachs Brazil: 0800 727 5764 and / or ouvidoriagoldmansachs@gs.com. Available Weekdays (except holidays), from 9am to 6pm. Ouvidoria Goldman Sachs Brasil: 0800 727 5764 e/ou ouvidoriagoldmansachs@gs.com. Horário de funcionamento: segunda-feira à sexta-feira (exceto feriados), das 9h às 18h; in Canada by either Goldman Sachs Canada Inc. or Goldman Sachs & Co. LLC; in Hong Kong by Goldman Sachs (Asia) L.L.C.; in India by Goldman Sachs (India) Securities Private Ltd.; in Japan by Goldman Sachs Japan Co., Ltd.; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs New Zealand Limited; in Russia by OOO Goldman Sachs; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman Sachs & Co. LLC. Goldman Sachs International has approved this research in connection with its distribution in the United Kingdom and European Union.

European Union: Goldman Sachs International authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority, has approved this research in connection with its distribution in the European Union and United Kingdom; Goldman Sachs AG and Goldman Sachs International Zweigniederlassung Frankfurt, regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht, may also distribute research in Germany.

General disclosures

This research is for our clients only. Other than disclosures relating to Goldman Sachs, this research is based on current public information that we consider reliable, but we do not represent it is accurate or complete, and it should not be relied on as such. The information, opinions, estimates and forecasts contained herein are as of the date hereof and are subject to change without prior notification. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than certain industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

Goldman Sachs conducts a global full-service, integrated investment banking, investment management, and brokerage business. We have investment banking and other business relationships with a substantial percentage of the companies covered by our Global Investment Research Division. Goldman Sachs & Co. LLC, the United States broker dealer, is a member of SIPC (https://www.sipc.org).

Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and principal trading desks that reflect opinions that are contrary to the opinions expressed in this research. Our asset management area, principal trading desks and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

We and our affiliates, officers, directors, and employees, will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives, if any, referred to in this research, unless otherwise prohibited by regulation or Goldman Sachs policy.

The views attributed to third party presenters at Goldman Sachs arranged conferences, including individuals from other parts of Goldman Sachs, do not necessarily reflect those of Global Investment Research and are not an official view of Goldman Sachs.

Any third party referenced herein, including any salespeople, traders and other professionals or members of their household, may have positions in the products mentioned that are inconsistent with the views expressed by analysts named in this report.

This research is focused on investment themes across markets, industries and sectors. It does not attempt to distinguish between the prospects or performance of, or provide analysis of, individual companies within any industry or sector we describe.

Any trading recommendation in this research relating to an equity or credit security or securities within an industry or sector is reflective of the investment theme being discussed and is not a recommendation of any such security in isolation.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Clients should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The price and value of investments referred to in this research and the income from them may fluctuate. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors. Investors should review current options disclosure documents which are available from Goldman Sachs sales representatives or at https://www.theocc.com/about/publications/character-risks.jsp. Transaction costs may be significant in option strategies calling for multiple purchase and sales of options such as spreads. Supporting documentation will be supplied upon request.

Differing Levels of Service provided by Global Investment Research: The level and types of services provided to you by the Global Investment Research division of GS may vary as compared to that provided to internal and other external clients of GS, depending on various factors including your individual preferences as to the frequency and manner of receiving communication, your risk profile and investment focus and perspective (e.g., marketwide, sector specific, long term, short term), the size and scope of your overall client relationship with GS, and legal and regulatory constraints. As an example, certain clients may request to receive notifications when research on specific securities is published, and certain clients may request that specific data underlying analysts' fundamental analysis available on our internal client websites be delivered to them electronically through data feeds or otherwise. No change to an analyst's fundamental research views (e.g., ratings, price targets, or material changes to earnings estimates for equity securities), will be communicated to any client prior to inclusion of such information in a research report broadly disseminated through electronic publication to our internal client websites or through other means, as necessary, to all clients who are entitled to receive such reports.

All research reports are disseminated and available to all clients simultaneously through electronic publication to our internal client websites. Not all research content is redistributed to our clients or available to third-party aggregators, nor is Goldman Sachs responsible for the redistribution of our research by third party aggregators. For research, models or other data related to one or more securities, markets or asset classes (including related services) that may be available to you, please contact your GS representative or go to https://research.gs.com.

Disclosure information is also available at https://www.gs.com/research/hedge.html or from Research Compliance, 200 West Street, New York, NY 10282.

© 2019 Goldman Sachs.

No part of this material may be (i) copied, photocopied or duplicated in any form by any means or (ii) redistributed without the prior written consent of The Goldman Sachs Group, Inc.