



Dalberg

DECODING DIVERSITY

The Financial and Economic Returns to Diversity in Tech

FOREWORD

Data is powerful. It allows us to be results-driven, to understand issues at their root cause, to find out what is working and what is not, and use that information to drive decisions more effectively. In the diversity & inclusion space, data is critically important, but often under-utilized. As we continue on our journey to reach full representation of women and underrepresented minorities at Intel by 2020, data is integral to our strategy. We use it to objectively set goals, track our progress, identify where the challenges are, and shift actions when needed.

Data can be used to build a case and rationale for why something is worth investing in. There have been studies in the past showing the importance of diversity & inclusion to business. We wanted to better understand what that looked like specifically for the technology industry and the unique attributes of our sector, where the representation of women and underrepresented minorities is a challenge. We wanted data on the unique financial and economic impact of diversity in the tech sector, and further new analysis on evidence-based actions the tech industry can take to encourage and accelerate diversity goals. This can help the tech sector, as well as governments around the world, better size the opportunity diversity and inclusion brings not only to business, but to the economy at large.

This study presents the first-of-its-kind analysis of the economic impact of improving diversity in the technology sector, based on diversity data from nearly 170 companies. The study shows correlations between more diverse tech company workforces and higher revenues, profits, and market value. We see this outcome as a tool that can be used to foster dialogue, discussion and tactical strategies with key stakeholders. We hope it will lead to the investment in strategies to improve diversity & inclusion in the technology industry. At Intel, we see significant opportunities and value to improving the representation of women and underrepresented minorities, increasing the diversity of our overall workforce, and making our workplace more inclusive for all employees. We hope that together we can drive more collaboration around diversity & inclusion in tech, new thinking, and new ways to inspire disruption for accelerated diversity outcomes.



Danielle Brown, Chief Diversity & Inclusion Officer and Vice President, Intel Corporation

A handwritten signature in black ink that reads "Danielle Brown".



Barbara Whye, Deputy Director, Diversity in Tech Initiative

A handwritten signature in black ink that reads "Barbara A. Whye".

"The (tech) industry is at that moment where we're starting to wake up. We, as a Nation, must challenge every CEO, every company, and every investor to think about what they can do to ensure that they are tapping into all of our Nation's talent so that their workforces and investment portfolios look like America"

- Megan Smith, United States Chief Technology Officer



TABLE OF CONTENTS

- I. Overview
- II. Hidden Barriers
- III. More Diversity, Better Performance
- IV. More Evidence, More Diversity
- V. Opportunities
- VI. Diversity in the Global Context

EXECUTIVE SUMMARY

Improving ethnic and gender diversity in the U.S. technology workforce represents a massive economic opportunity, one that could create \$470 – \$570Bn in new value for the tech industry, and could add 1.2 – 1.6% to national GDP.

The U.S. technology industry could generate an additional \$470 billion to \$570 billion in new value—which consists of a combination of higher revenues and higher market values—through full representation of racial/ethnic diversity among staff and greater representation of gender diversity among leadership. Growth on this scale would have major implications for both the labor and consumer markets, supporting job creation and better products. And yet, the tech industry is not drawing upon the full pool of available talent.

While it is no secret that women and racial/ethnic minorities are underrepresented at tech companies—by 19-percentage-points for women compared to their presence in the US labor force; by 16 – 18-percentage-points for Hispanics, African Americans, and Native Americans—it may come as a surprise to learn how little these figures have changed in the last 15 years.

For technical roles, female representation falls to 12 percent—far short of the proportion of women working in many other occupations traditionally viewed as male-dominated (to name a handful: oil drilling, metal forging, and investment management). Tech leaders recognize this gap and are investing to shrink it, yet racial/ethnic minority representation has only improved by 1 – 2-percentage-points over fifteen years, and female representation has fallen by one-percentage-point.

This report offers first-of-its-kind analysis of the economic impact of improving diversity in the tech sector, based on diversity data from nearly 170 companies.

These findings indicate clear correlations—though not necessarily causation—between more diverse tech company workforces and higher revenues, profits, and market value.

The data show that every incremental percentage point in African American and Hispanic representation is linked with a three-percentage-point increase in revenues, meaning that the sector could generate an additional \$300 – \$370Bn each year if the racial/ethnic diversity of tech companies' workforces reflected that of the talent pool. Similarly, closing the gap in female leadership representation could boost enterprise value by \$320 – \$390Bn across the sector. This analysis is only now possible because a number of tech companies—including such leading firms as Apple, Yahoo, and Facebook among others—have committed to publicly releasing diversity data.

This analysis is based on regression analyses which use a data set of nearly 170 tech companies that have published, released, or publically discussed their top-line diversity figures.

The Dalberg research team collected gender and racial/ethnic diversity data on these companies, and then performed regression analysis to understand the relationship between gender diversity, racial diversity and financial success. This analysis controlled for a range of other variables (including employee count and company age) and yielded several statistically significant results. Dalberg applied these results to the domestic technology companies listed on the NASDAQ to estimate the industry-wide effects on revenues, market value, and operating margin. This methodology is detailed in full in the report annex. While correlation does not equal causation, initial indicators are positive and suggest that more research on linkages between performance and diversity in tech is warranted.



Improving diversity in the tech workforce also supports national productivity, with potential growth on the order of 1.2 – 1.6% if the industry can close the gap in representation of women and racial/ethnic minorities.

The technology sector contributes approximately 7% to the nation's annual GDP, meaning that a surge in tech sector performance would have significant impact on the US economy. Assuming that closing this gap requires at least five years, this equates to an annual 0.2 – 0.3-percentage-point boost in national economic growth, over recent average annual growth of 2.2 – 2.4%.

Deeper analysis on the linkages between racial/ethnic diversity and business performance yields several other new insights:

- Every incremental percentage point in African American and Hispanic representation is linked with a three-percentage-point increase in revenues at NASDAQ-listed tech companies
- Every one-percentage-point increase in racial/ethnic diversity is linked with a 0.3 – 0.4-percentage-point increase in operating margins. By extension, levels of racial/ethnic diversity that reflect the talent marketplace would be linked with a \$6 – 7Bn increase in operating earnings industry-wide

- Technology companies with racial/ethnic diversity above the median are 14 – 17 percent more likely to generate revenues above industry medians

Put another way: if two companies are identical in every way except for racial/ethnic diversity and female representation in leadership, the more diverse company will, in all likelihood, have higher revenues, be more profitable, and have a higher market value.

Analysis of the linkage between diversity and financial performance controlled for factors like employee count, years of operation, and depending on the analysis, market cap, revenues, and/or profits (full methodology detailed in annex).



At small tech companies and startups, diversity's dividend could also be high:

- Small tech companies are, on average, 25 – 30 percent less diverse than large tech companies, but small changes can make a big difference: at a small tech company with \$10Mn in annual operating profits, increasing minority representation by five-percentage-points would be associated with an annual profit boost of \$1.5 – \$2Mn
- The estimated returns to racial/ethnic diversity could add as much as 15 – 20 percent to an early-stage startup's valuation, providing these companies with a longer runway to test ideas, innovate, and grow

Beyond effects within the U.S., closing the global tech industry's female leadership gap could add between 0.5 – 0.6 percent to global GDP.

This equates to a \$430 – \$530Bn boost in global productivity, roughly equivalent to a new economy the size of Norway or Taiwan. Accomplishing this will be a challenge—for example, roughly 60 – 70% of women working in STEM in China, India, and Brazil report experiencing regular sexual harassment (compared to an already disturbing 52% who report such behavior in the United States)—but the payoff could be tremendous.

Bottom line: Advancing diversity in tech is good citizenship, good for business, and good for the national and international marketplace.

This report urgently calls on tech companies to commit to a goal of “Five in Five”—that is, increasing representation of ethnic minorities and women in technical and leadership roles by five-percentage- points in five years.

The tech industry has made an estimated \$0.8-1.2Bn investment in diversity over the past five years. The size of the investment and the level of commitment are laudable. Yet this report finds that amplifying returns on these and future investments depends on three types of action: sharing more data, collecting better evidence, and investing in what demonstrably works.

Companies can pledge to

- Implement and publish company-specific goals to recruit, retain, and advance diverse technology talent, and operationalize concrete measures to create and sustain an inclusive culture
- Annually publish data and progress metrics on the diversity of our technology workforce across functional areas and seniority levels
- Invest in partnerships to build a diverse pipeline of technology talent to increase our ability to recognize, develop, and support talent from all backgrounds

These three actions are some of the most important steps to achieve the tech industry's diversity goals. Several other actions can build on these and accelerate progress, each supported by robust evidence emerging from years of rigorous study. Companies can consider:

- Using metrics to hold line managers accountable for diversity goals, which is more effective than mentorship or training
- Formalizing sponsorship programs, which are more effective than mentorship alone
- Integrating race/ethnicity/gender-blind recruitment tracking systems, which are more effective than non-blinded systems

By committing to ‘Five in Five’—and to the evidence-based actions needed to reach this goal—the tech industry will make significant strides toward capturing the full range of available talent. Doing so, this report concludes, will bring tremendous financial, economic, and social benefits.

CHAPTER 1: OVERVIEW

Improving racial/ethnic and gender diversity in the U.S. tech workforce represents a massive opportunity waiting to be claimed, on the order of \$300 – \$370Bn for racial/ethnic diversity, and \$320 – \$390Bn for gender diversity. This report will explain why, and what can be done to encourage a more representative and more equitable workforce that can lead to significant economic returns.

Thanks to a surge of mass media attention and commitments to transparency on the part of large tech companies, we now have a clearer picture of the state of diversity in the tech industry.

There is work to do, and companies are rising to the challenge by taking concrete action. The benefits to society of an increasingly diverse tech sector will be significant—but so will the benefits to the industry itself.

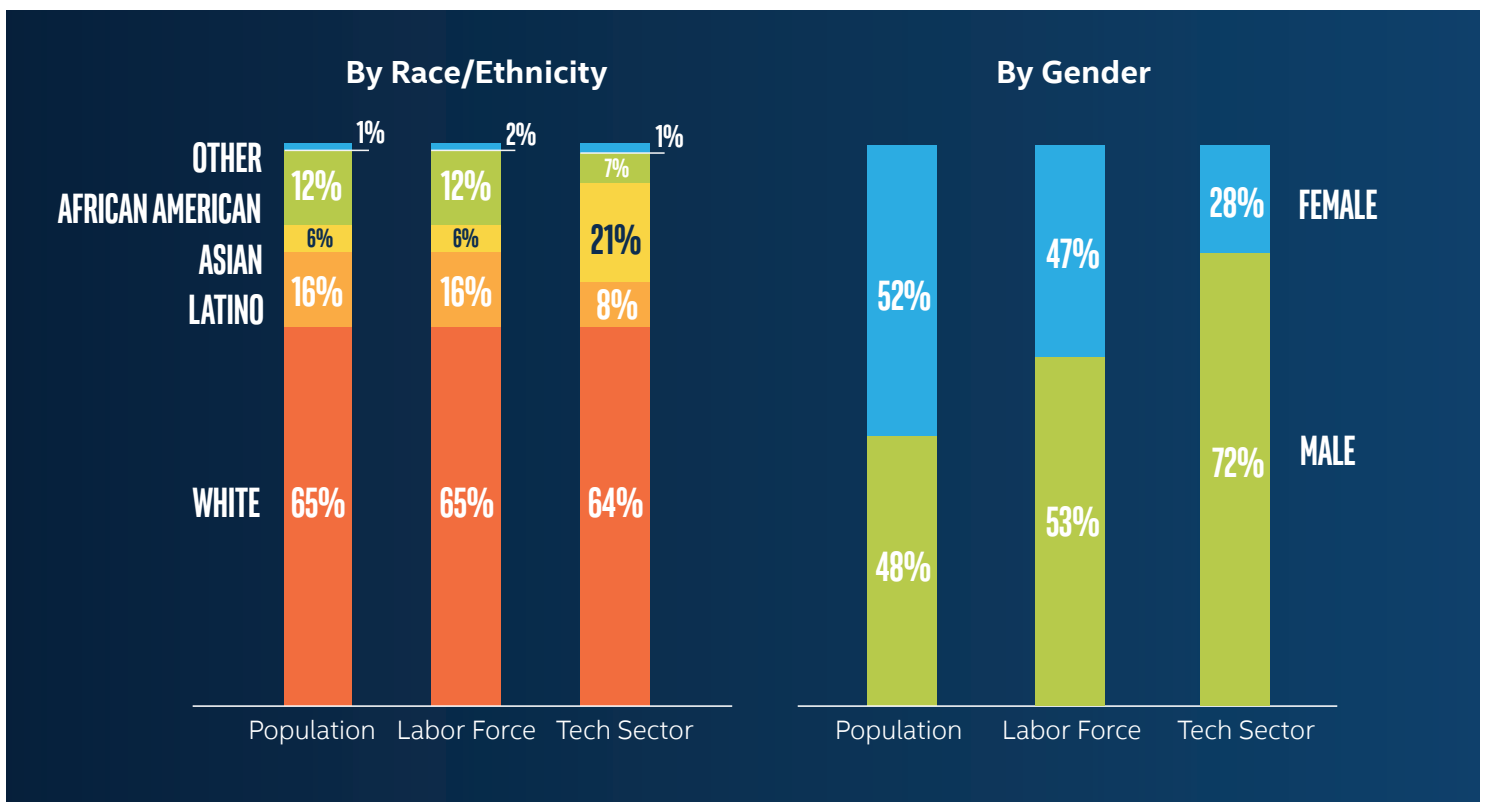
This report presents new-to-the-world analysis quantifying the unique financial and economic impact of diversity in the tech sector, and further new analysis on evidence-based actions the industry can take to encourage diversity. Bottom line: In tech, advancing diversity is good for business, good citizenship, and good for the national marketplace.

Who is missing?

A million women are missing from the US tech sector.

Women represent just 28 percent of the tech workforce, including both those in technical and non-technical roles.¹ This reflects a shortfall of 900,000 – 1Mn women in the tech sector compared to the 51 percent ratio of women in the U.S. population, or over 700,000 women, compared to the 47 percent ratio of women in the general U.S. labor force.² Women also make up just 19 – 20 percent of C-suite executives, and of C-suite line roles (e.g., CEO, CMO) only 13 – 14 percent.³

Exhibit: Overview of Diversity in the US Tech Workforce



The gap is particularly wide for technical roles.

According to the National Center for Women & Information Technology, women hold only about 25 percent of IT-related jobs in all sectors. According to one survey of roughly 250 Silicon Valley startups, women account for just 12 percent of engineers.⁴ The numbers are much worse for women from underrepresented minorities; for example, Hispanic women make up only two percent of the computing workforce, despite making up roughly eight percent of the general population.

The pipeline of candidates reflects a similar disparity.

Women earn about 12 percent of computer science degrees. The trend has gotten notably worse over time: women made up 37 percent of computer science majors in the mid-1980s.⁵ The beginning of this decline roughly corresponds with the rise of the personal computer, and one new theory points to the widespread perception (and marketing reality) that the PC was a toy for boys.⁶

“White and Asian males have a computer culture that embraces them: video games, science fiction, and so on. If we want women and underrepresented groups to belong, we have to expand that culture.”

-Maria Klawe, computer scientist and President of Harvey Mudd College

The tech sector is also missing half a million racial/ethnic minorities.

African American, Hispanic, and Native American employees make up only 12 – 15 percent of the overall tech workforce (including both technical and non-technical roles) compared to 31 percent of the general labor force.⁷ This represents a shortfall of nearly 550,000 people of color. The picture is even starker when it comes to racial/ethnic minorities in technical roles—Hispanics, African Americans, and Native Americans hold only seven – nine percent of these positions.⁸

What changes are happening?

The past few years have brought a very public change in the way Silicon Valley has addressed this challenge. CEOs are beginning to use their platforms to acknowledge the industry’s shortcomings and confront diversity issues head on. Many leading tech companies are taking bold steps toward transparency, setting ambitious goals and specific targets, and openly committing to creating a more inclusive future.

Over the past five years, tech companies have invested an estimated \$0.8 – \$1.2Bn in a range of initiatives that aim to build pipelines of female and racial/ethnic minority applicants, recruit them more effectively, retain them for longer, and support their rise once they come on board.

Since 2014, several companies have taken the bold step of making their diversity goals explicit and public. Pinterest plans to hire 30 percent women and eight percent underrepresented minorities in 2016.⁹ Salesforce has announced the “aggressive goal” of employing equal numbers of men and women within five years, and, further, will be reviewing all employee salaries to ensure that women and men are paid the same for the same role.¹⁰

¹ Dalberg Diversity in Tech Database

² Census, U.S. Bureau of Labor Statistics

³ Estimates calculated based on sub-sample of technology companies. Source: Molla, Rani and Renee Lightner. “Diversity in Tech,” Wall Street Journal. Nov 2015; Lee, Wendy. “Women rarely reach top in tech, despite signs that diversity pays,” SF Chronicle. Dec 2015; McKinsey, “Women in the Workplace,” 2015; EEO-1 of companies; Dalberg analysis

⁴ Data available at <https://github.com/triketora/women-in-software-eng>

⁵ Camp, Tracy. “Women in Computer Sciences: Reversing the Trend,” Colorado School of Mines, Aug 2001.

⁶ Leonard, Andrew. “A new explanation for tech’s pathetic gender diversity: The personal computer,” Salon. Aug 2014.

“To achieve sustainable workforce diversity, we need to move our thinking and approach to inclusion and diversity from a cost center to a revenue generator view. This position building and maintaining inclusive corporate cultures on the same level as profit, growth and innovation – where it belongs.”

–Ruthe Farmer, Chief Growth and Strategy Officer, NCWIT.org

Several industry giants have committed to supporting diversity in primary and secondary education.

Facebook, for example, has provided financial support to education programs that teach coding skills to underrepresented communities. Intel too has increased its engagement with primary education programs that focus on STEM, in underserved areas.

These tech industry efforts to bolster primary education will dovetail with the White House's new Computer Science for All (CSA) initiative.

CSA will provide states with \$4Bn in funding, and will send another \$100Mn directly to school districts to improve computer science education in grades K – 12 through teacher training, increased access to up-to-date, high-quality teaching materials, and new partnerships.

Google's \$150Mn commitment to diversity will include embedding engineers as teachers and curriculum advisors at a handful of historically black colleges and universities (HBCUs).

Apple's \$50Mn commitment also targets young adults. The company is partnering with HBCUs, as well as the National Center for Women and Information Technology, to provide scholarships, college training programs, and paid internships that will help women and minorities land jobs in the tech sector.

Tech companies are also committing to support minority tech entrepreneurs.

African Americans and Hispanics currently represent less than one percent of all startup founders.¹¹ The Google NextWave program aims to financially and professionally support entrepreneurs from underrepresented communities. Its first project is the CODE2040 Residency, which, in partnership with tech hubs across the country, provides one-year residency fellowships to African American and Hispanic founders. Meanwhile, over the next five years, the Intel Capital Diversity Fund will be investing \$125Mn in minority-led startups.

To help create a hiring pipeline of female and underrepresented engineers, companies are investing in education and revisiting their recruiting approaches. For example, Intel's \$300Mn investment in diversity over five years

will support, among other projects, the Hispanics in Technology Scholarship Initiative—comprising 125 scholarships for Hispanic college students studying science, technology, math, or engineering; the Next Generation of Native American Coders Initiative—enhanced computer science curriculum, tutoring, and mentoring at three Arizona high school in the Navajo Nation; a \$5Mn partnership with the Georgia Institute of Technology to support over a thousand minority students over the next five years; and a five-year \$5Mn initiative to enhance computer science education in high schools within the Oakland Unified School District, a district composed of 65% African American and Hispanic students.^{12 13} Facebook is also taking steps to widen the pool of candidates from which it hires—a pilot program requires managers to interview at least one qualified candidate from an underrepresented group



(Twitter has a similar pilot). Meanwhile, Google has devoted considerable resources to testing the fairness of its own hiring, promotion, performance-evaluation, and compensation programs. For example, Google's people analytics team found that women in technical and product management jobs were less likely to self-nominate for promotion than men, and so began circulating emails that explained promotion statistics by gender and level. Soon after, they saw an increase in women promoting themselves, and attribute that boost to the data-driven email to staff.¹⁴

Hiring is one piece of the puzzle; promoting a path to leadership for minority employees is another challenge the industry has begun to address.

Cisco Systems invested in executive development by creating a "007 team" of high potential leaders responsible for bringing serial innovations to market. The team is picked from a highly diverse pool of international talent that specifically includes women and African Americans. Cisco has also introduced strategies to address the shortfall of qualified women and people of color in its vice-presidential pipeline by scrutinizing the company's pool of directors for candidates that maximize cohort diversity.

Investments in diversity within tech are beginning to recognize the scale of the challenge facing the industry, and also identifying the many ways in which diversity drives bottom-line performance.

There are a range of barriers facing efforts to advance diversity in tech, some of which have received more attention than others. The next chapter reviews these barriers briefly, and highlights two where tech companies have an opportunity to make rapid progress.

"We are absolutely resolute in our belief that diversity and inclusion are key to Intel's evolution and driving forces for our continued relevancy and growth as a company."

-Danielle Brown, Chief Diversity & Inclusion Officer, Intel

¹² "Intel Collaborates with Georgia Tech to Boost Diverse Tech Pipeline," Intel Newsroom. Aug 2015.

¹³ Guynn, Jessica. "Intel pilots \$5 million 'scholars' program in Oakland, Calif. Schools," USA Today. May 2015.

¹⁴ Rafter, Michelle. "Laszlo Bock: Just Google Him," Workforce. Mar 2015.

CHAPTER 2. BARRIERS

Diversity levels for the tech industry have hardly changed since the early 2000s, suggesting more investment and a different approach may be necessary.

Women comprised 27 percent of the computing workforce in 2001 (the earliest year in which comparable data appears to be available) and 28 percent in 2014. African Americans and Hispanics: 13 percent in 2001, 14 percent in 2014.¹⁵

Several oft-cited barriers to diversity in tech keep these figures low.

Underrepresented minorities working in tech cite unsupportive work environments, intermittent harassment, and a lack of relatable role models. In the university pipeline, oft-cited reasons for women and racial/ethnic minority underrepresentation in computer science and engineering are covert stereotyping, low expectations among teachers, and unequal access to classes and facilities. Many that do aim to work at a tech company are not graduating from colleges popular for recruiting among tech companies, and some cite bias in the interview and resume review processes.

Two important barriers have received less attention: limited data and evidence.

We do not have a clear understanding of i) which tech companies are making progress toward their diversity goals, and in what ways, due to a lack of data sharing by most companies, and 2) why some companies are improving, in comparison to the past and/or others, due to a lack of rigorous, peer-reviewed evidence on the effectiveness of diversity advancement activities.

⁷ Dalberg Diversity in Tech Database

⁸ Workforce diversity reports from 11 major tech firms. (Apple, Cisco, eBay, Facebook, Google, HP, Intel, LinkedIn, Microsoft, Twitter, Yahoo).

⁹ "Our plan for a more diverse Pinterest," Pinterest Blog, Jul 2015.

¹⁰ Robbins, Cindy. "Working Toward a More Diverse Salesforce Future," Salesforce Blog, Sep 2015.

¹⁵ It is worth noting that that these numbers apply to computing jobs in all sectors; data on diversity specific to major tech companies is only available for shorter timeframes. However, interviews suggest these numbers are an accurate reflection of the long-term progress on diversity at most tech companies.

Data shortfall

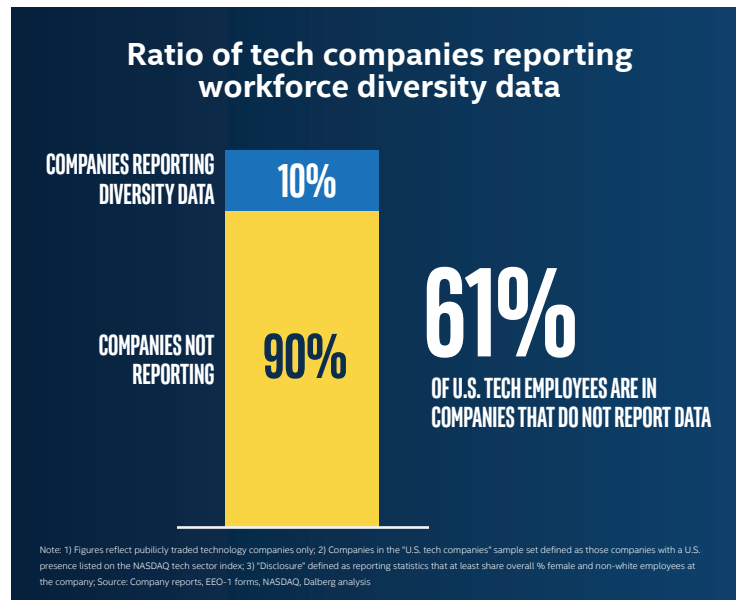
Making industry-wide progress on diversity will require gathering and sharing more and better diversity data.

Granular data – e.g., on exit rates and rationale among underrepresented minorities – will help decision makers within a company track progress over time, make course corrections as needed, and identify which initiatives have driven success over the long term. In addition, sharing more and better data presents an opportunity to establish a diversity baseline, which is crucial to both establishing industry-wide accountability and pinpointing the best returns on investments in diversity. While sharing data can be hard, the risks can be mitigated while still allowing for the necessary analyses.

As of March 2016, nineteen tech companies had shared topline diversity statistics via their EEO-1 forms.

With a few notable exceptions, they tend to be the largest tech companies in the U.S., concentrated in Silicon Valley. This is a fine start, yet the U.S. tech industry includes a long tail of companies whose brands are less familiar but who collectively employ more people. These companies have a great opportunity to contribute their own data on diversity and inclusion—and thereby help create an accurate baseline against which industry progress can be measured.

Exhibit: Ratio of Tech Companies Reporting Topline Diversity Data



While there are official industry-wide diversity reporting mechanisms already in place, their quality and utility are subject to debate.

The structure of the EEO-1—the government's primary tool to enforce reporting of company diversity—is controversial. The government is currently proposing improvements to this data collection tool, such as including data on pay by gender, race, and ethnicity. However, these changes still will not capture the detailed data the sector needs to drive progress. For individual companies, clear disaggregated data, such as diversity recruitment targets and outcomes, exit rates and reasons, promotions, and ratios of underrepresented minorities in technical versus non-technical roles, can most help company leadership understand where to invest and how. Opportunities to expand the EEO-1 to fit the needs of tech companies is further detailed in section 5: "Opportunities."

Evidence shortfall¹⁶

So far, few rigorous studies have looked at the tech industry's efforts to increase diversity.

In other words, few studies tackle the question of which approaches work within tech companies and in the tech sector as a whole—and which do not—in a manner that is hypothesis-driven and peer-reviewed, draws on a large sample size, and uses statistical techniques appropriate to the study's design. In the absence of these data, company leaders rely on a feeling of what seems to be working for their teams, and invest in a portfolio of activities, using their experience and intuition to achieve positive outcomes. Even these experienced, seasoned diversity leaders could be even more effective when armed with best-in-class evidence.

When rigorous study is undertaken, the results can be surprising.

For example, a longitudinal study of over 700 U.S. companies found that annual diversity training for managers - sessions designed to provide information on where bias exists and specifies behaviors to avoid - "have no positive effects in the average workplace," and may even decrease representation of African American women.¹⁷

Without such research, companies may continue to put resources into ineffective trainings, rather than question their design or invest in other activities.

Tech companies can accelerate progress toward their diversity goals by compiling evidence on what works well to foster diversity in their organizations.

At the educational and pipeline development levels, we already see a growing body of evidence. For example, organizations such as Change the Equation have created large databases to house evaluations of education programs. Evidence on what works that companies can implement now is discussed in Chapter 5.

These efforts are essential because improving workforce diversity takes time.

Workforce diversity is achieved and sustained through an extended period of good decisions. This almost certainly requires that decision-makers have the ability to see gaps, trace the processes of different activities and programs, and measure their impacts over time.

"The first and most important barrier was about creating awareness on the need for gender equality. Companies are sharing data, but they can do more."

-Terri McCullough, Director of No Ceilings: The Full Participation Project at the Clinton Foundation

¹⁶ "Google & Diversity: a Lady Googler's Perspective," Medium.com. May 2014.

¹⁷ Kaley, Alexandra, Frank Dobbin, and Erin Kelly. "Best Practices or Best Guesses? Assessing the Efficacy of Corporate Affirmative Action and Diversity Policies," *American Sociological Review*. Vol 71(4), Aug 2006, 589-617.

CHAPTER 3. MORE DIVERSITY, BETTER PERFORMANCE

For tech companies, the most compelling case for advancing diversity may be the business case.

Studies and research reports on the returns to diversity in a corporate context generally are widely available in a range of other sources (some of which are cited below). However, almost none of these studies have been specific to the tech sector. This has been a missed opportunity: tech companies work on unconventional questions that require creative problem-solving, and diverse groups have been shown to outperform on precisely these types of problems. Innovation, creativity, contrarian thinking, and competing points of view have long been the keys to success in the tech industry. This section will describe how gender and racial/ethnic diversity helps to support all of these throughout a tech organization, and how they drive financial performance through these pathways. The data drive home the point. Put simply, companies that are more diverse in race/ethnicity and gender are more successful financially. Both racial/ethnic and gender diversity are linked to significant economic impacts.

Summary Findings

Achieving representational racial/ethnic diversity could help the tech sector generate an additional \$300-\$370Bn in revenue annually; achieving representational gender diversity in leadership could help drive \$320-\$390Bn in increased market value. Combined, these could reflect 1.2 - 1.6% growth in national GDP.

In addition to the business growth and value that could be created by a more diverse technology workforce, employment in the technology sector is a gateway to higher incomes and more productive work for many women and racial/ethnic minorities. Tech is one of the United States' most productive sectors, and shifting people into tech from jobs in other sectors could help these individuals produce gains for their communities, regions, and nation.

GDP growth was estimated by calculating the boost in tech sector valuations that could result from achieving female and racial/ethnic representation, benchmarking the relationship between market valuations and national productivity, and relating growth estimates to the total portion of US GDP the technology sector represents. For more details on how this number is estimated, please see the methodology in the annex.

This is new analysis of the financial and economic impact of diversity in the tech sector, which this report presents as an invitation to build upon these findings for further research and analysis.

Researchers have extensively studied other sectors and corporate environments in general for diversity's gains. This report cites many of those studies below. This report's findings signal that investing in research to estimate the relationship between diversity and performance in technology are worthwhile undertakings, using alternative methods to those used here. This report shares these findings not as the "definitive word" on the relationship between diversity and financial performance in tech, but rather as a stepping stone for others to use to advance research in this space.



A natural next step for this research is to confirm the direction of the relationship between diversity and performance.

While there are clear correlations between diversity and performance in tech, further research is needed to definitively prove *causation*: i.e., that diversity drives performance, and not the other way around. In future research it is possible to resolve this question with a range of study designs that control for endogeneity, and reverse causality in particular. However, these studies require investment of time and resources. The findings in this report signal that these may be worthwhile investments.

Economic Returns on Racial/Ethnic Diversity
Financial Impact: Mid-sized and Large Tech Companies

The correlation between workforce racial/ethnic diversity and financial performance is sizable and clear.

This report finds that every incremental percentage point in African American and Hispanic representation at NASDAQ-listed tech companies is linked with a three-percentage-point increase in revenues.¹⁸ If the racial/ethnic diversity of tech companies' workforces reflected that of the engineering talent pool, the sector at large could generate a 20 – 22 percent increase in revenue—an additional \$300 – \$370Bn each year.

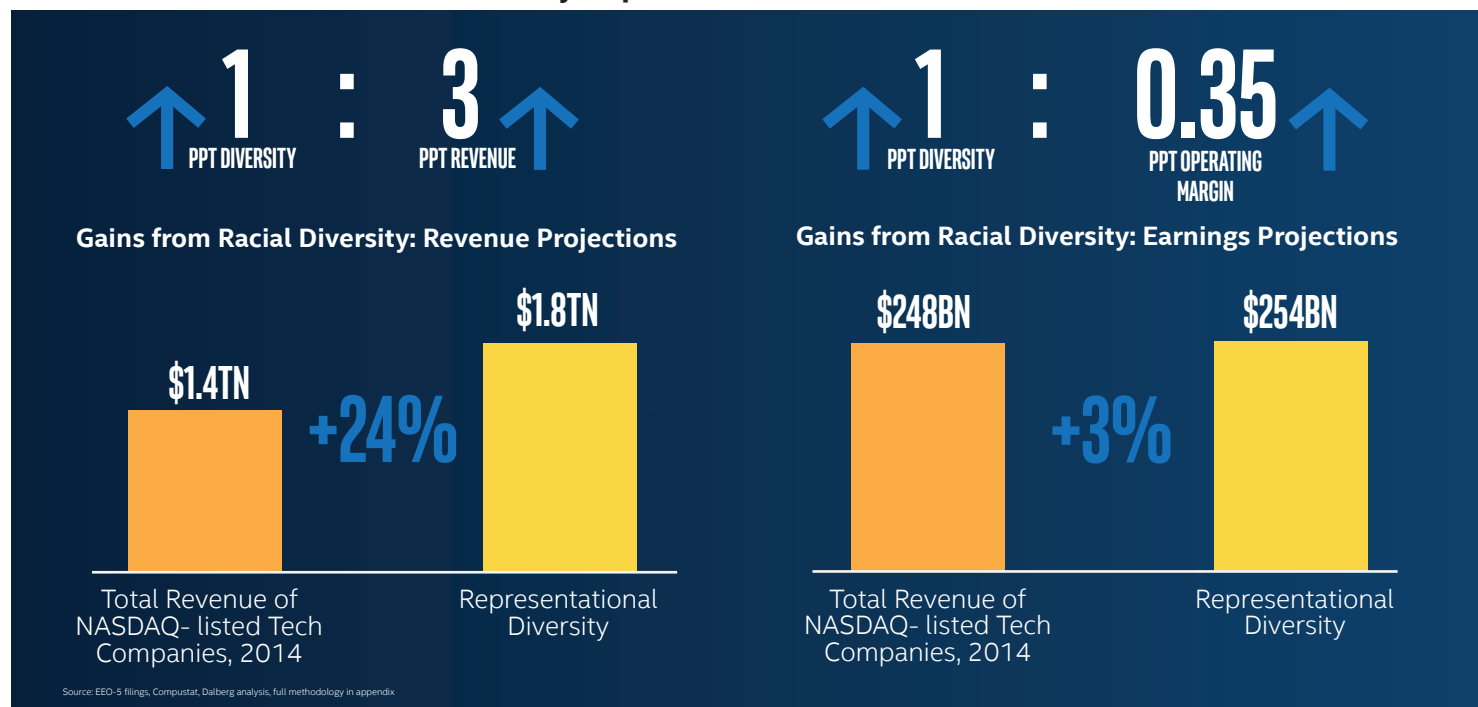
This correlation between revenues and diversity holds when broken down to the level of Hispanic representation in the workforce.

Companies with above-median Hispanic representation (currently standing at roughly five – six percent of the technical workforce) are linked with annual revenues that are 40 percent higher than companies that fall below the median in Hispanic representation.¹⁹ The links between African American representation and revenues were also positive, yet did not show statistical significance. These findings are likely to apply to mid-sized and large tech companies; this analysis was performed on a sample of tech companies that range in size from 1,500 to 150,000 employees. Further analysis on the impact of racial/ethnic diversity at startups and small tech companies is noted later in this section.

There is also a linkage between racial/ethnic diversity and operating margins: every one-percentage-point increase in racial/ethnic diversity at a tech company is linked with 0.3 – 0.4-percentage-point increase in operating margins.

Extrapolating to the tech sector as a whole, achieving levels of racial/ethnic diversity that reflect the talent marketplace would be linked with \$6 – 7Bn in additional operating earnings industry-wide, or roughly a two – three percent increase in total industry earnings.²⁰

Exhibit: Estimated Returns to Minority Representation



“Diversity is linked to financial performance through multiple methods of competitive action, and we found that context matters...in companies, higher heterogeneity in management is associated with higher performance. We also found that a heterogeneous management is more likely to experience greater performance than a homogenous one in munificent environments that benefit from a diverse human capital pool.”

-Orlando C. Richard, PhD, Diversity Researcher and Associate Professor of Organizations, Strategy, and International Management, UT Dallas

Taken as a group, tech companies that are below the median in racial/ethnic diversity are 17 – 20 percent more likely to fall short of median revenue levels.

The reverse is also true: companies with racial/ethnic minority diversity above the median are 14 – 17 percent more likely to produce revenue above the industry median. The extremes are even more illuminating. Tech companies that fall in the top 10 percent of racial/ethnic diversity are, on average, 59 – 72 percent more likely to earn more revenue than those that fall in the bottom 10 percent. Similar effects hold for profitability: companies with very low levels of racial/ethnic diversity are 18 – 22 percent more likely to fall short of median operating margins.²¹

Financial Impact: Small and Startup Tech Companies

For small tech companies (under 6,000 employees), the potential “diversity dividend” is even greater.

Small tech companies are, on average, 25 – 30 percent less racially/ethnically diverse than large tech companies. However, incremental changes can make a big difference at a small firm.

For example, at a tech company with \$10Mn in operating profits per year, boosting minority representation by five-percentage-points would be associated with roughly \$2 – 3Mn in additional annual operating profit.

It is essential that younger tech companies move quickly to claim this diversity dividend: more mature companies have a head start.

Companies that are over ten years of age have workforce representation of African Americans that is over 2x that of companies below ten years of age, and 1.4x the representation of Hispanics. Older tech companies tend to be more racially/ethnically diverse, and are therefore more likely to be reaping the revenue and profit gains that come with that diversity.

¹⁸ Technology companies listed on the NASDAQ were selected as the basis for our analysis as the NASDAQ is commonly followed as an indicator of the performance of technology companies as a group

¹⁹ Company EEO-1 disclosures, can be downloaded from opendiversitydata.org

²⁰ Dalberg Diversity in Tech Database; Dalberg analysis. Full methodology detailed in annex.

²¹ Ibid.

²² All other analyses controlled for age when assessing how diversity explains the variation in company revenues and profitability; while it is true that older technology companies tend to have higher revenues and margins, diversity's impact on financial performance holds true regardless of the company's age.

Startups take note: the estimated returns to racial/ethnic diversity hold regardless of company size, and could add 15-20 percent to early-stage valuations.

This analysis drew from a database of 167 companies; the largest was 25x as large as the smallest. Although the data available does not reach down to the level of 5 – 100 person startups, due to a lack of reporting, the robustness of these results indicates that startups with racially/ethnically diverse founding teams are more likely to see financial success. Specifically, startups that succeed in boosting their racial/ethnic diversity by just five employees out of a hundred could expect to see annual revenue growth of 15 - 20 -percentage-points. Assuming a consistent valuation multiple - 7x – 10x forward revenues being roughly typical for early stage startups – this could equate to a 15 – 20 percent boost in valuation.²³

What's more, smaller and leaner companies may be better positioned than their larger counterparts to champion diversity.

In interviews, tech startups frequently highlight their ability to pivot to new policies and organizational norms. This same nimbleness should make it that much easier for startups to more quickly change the operational and cultural norms that drive a lack of diversity.²⁴

Correlation, of course, does not prove cause and effect; the analyses above do not tell us if racial/ethnic diversity is a driver, a direct result, or a byproduct of financial success. Hiring more racial/ethnic minorities will not automatically guarantee a company's immediate financial growth. What these linkages do indicate, however, is that, as measured by profits, tech companies that achieve racial/ethnic diversity in their workforces are simply more successful than their peers. The reasons why this might be true are outlined below.

These links between diversity and financial performance are not unique to the tech industry—a range of studies conducted in other industries support them.

For instance, research published in the American Sociological Review found that firms with high levels of racial/ethnic diversity have more than 98 percent higher sales revenue, serve over 54 percent more customers, are roughly 33 percent more likely to have above-average market share, and are nearly 30 percent more likely to have above-average profitability than their less diverse competitors.²⁵ Another study, this one in the Academy Management Journal, suggests that highly diverse firms with a “growth strategy”—like most tech companies—will see more than twice the marginal mean productivity than those that are less diverse.²⁶



A third study, McKinsey's "Diversity Matters," was neither specific to the tech industry nor to U.S.-based firms, yet it, too, found that the financial returns of companies in the top quartile of diversity exceeded the national industry median 35 percent more of the time than did those of companies in the other three quartiles.²⁷

The picture might be a little more nuanced, however—at least when it comes to fundraising.

Another study showed a potentially important link between a company's reputation as a "diversity leader" and the ability to raise capital more cheaply than others. However, the effects of racial/ethnic diversity on firm performance were only positive after reaching a particular threshold—in this study, after 22 percent minority representation (including African Americans, Hispanics, Native Americans, and Asians).²⁸

Yet the evidence that racial/ethnic diversity pushes companies to innovate is clear.

Researchers looking at data on white-collar employees found that the ethnic diversity of a firm's workforce correlated positively with i) the likelihood that the firm had applied for any patents, ii) a greater number of total patent applications, and iii) a wider spectrum of technological fields in which the company had applied for patents.

In a second, broader study, researchers found that across 20 European countries, the presence of diverse skilled workers from migrant populations positively impacted the host country's published article citations and patent applications, as well as the productivity of native workers.³⁰

"There's a lot of research coming out now supporting the argument that diverse teams make better choices in complex situations, and I can think of multiple instances in my career in which the lack of diversity contributed to poor decision making. For example, I observed a company of mostly white, affluent iPhone users delay shipping on Android because Android users reportedly earn less money, and later regretting the choice after discovering their Android users are more engaged...If these teams were more diverse, especially among the leadership, I doubt the same choices would have been made."

- Wallace Leighton. "A black engineer's take on why diversity matters at startups," Lever. Mar 2016

²³ Wallace, Leighton. "A black engineer's take on why diversity matters at startups," Lever. Mar 2016.

²⁴ Dishman, Lydia. "How Two Startups Are Working To Change The Diversity Gap In FinTech," Fast Company. Aug 2015.

²⁵ Herring, Cedric. "Does Diversity Pay?: Race, Gender, and the Business Case for Diversity," American Sociological Review. Vol 74(2), Apr 2009, 208-224.

²⁶ Orlando Richard, "Racial Diversity, Business Strategy, and Firm Performance: A Resource-Based View." The Academy of Management Journal. Vol 43(2), Apr 2000, 164-177. This study also found a tradeoff to diversity that warrants mention: the productivity impact of diversity is negative in companies that are downsizing or otherwise aiming to control costs. Other research suggests this may be linked to the increased costs required to coordinate and maintain a diverse workforce.

²⁷ McKinsey, "Diversity Matters," Nov 2014.

²⁸ Roberson, Quinetta and Hyeon Jeong Park. "Examining the Link Between Diversity and Firm Performance: The Effects of Diversity Reputation and Leader Racial Diversity," CAHRS Working Paper Series. Cornell University Center for Advanced Human Resource Studies. Apr 2006.

²⁹ Parrotta, Pierpaolo, Dario Pozzoli, and Mariola Pytlikova. "The Nexus Between Labor Diversity and Firm's Innovation," Discussion Paper Series. Institute for the Study of Labor. Oct 2012.

A positive climate on racial/ethnic diversity may also help companies retain talent.

This, at least, was the conclusion of researchers who demonstrated robust statistical links between a positive perception of a firm's "diversity climate" and decreased turnover intentions. The effect extended to all employees, regardless of race/ethnicity or gender.³¹ A second study found that African American employees, in particular, were least likely to express turnover intentions at a place of work they perceived to be pro-diversity. Researchers tested employee perceptions of the diversity climate using a survey instrument containing questions like "do you believe the company recruits from diverse sources," and "do you believe top leaders are visibly committed to diversity?" Caucasian employees appeared to be more positively influenced by this pro-diversity climate than were Hispanic employees. This study found that perceptions of how diverse a company is accounts for up to 15 percent of turnover intentions within a given company.³²

One question the analyses could not answer: the financial impact of racially/ethnically diverse leadership teams—those with titles of SVP and above—on tech company performance.

Unfortunately—and in contrast with the analysis on gender diversity—the sample sizes were too small to draw meaningful conclusions about racially /ethnically diverse leadership.



African Americans make up roughly 2 – 3 percent of leadership at U.S. tech companies, Hispanics, three – four percent.³³ The picture is even starker among new tech companies: African Americans and Hispanics make up less than one percent of venture-backed tech company leaders.

Methods of Action

There may be several reasons for the relative success of diverse groups, whether in the boardroom, the lab, or the HR department.

A body of research—first popularized in James Surowiecki's 2004 book *The Wisdom of Crowds* and expanded upon in later books such as Clay Shirky's 2011 *Cognitive Surplus*, and Lior Zoref's 2015 *Mindsharing*—demonstrates the ways in which diverse groups can be smarter than the smartest person in them, and how they process information faster and more reliably than panels of expert deliberators. Diversity of opinion and perspective seem to have an intrinsic value for many kinds of tasks. And while any group of people will contain some variety of outlook and experience, socially diverse groups make it easier for individuals to voice dissenting opinions, while homogeneous groups, particularly small ones, are more likely to fall victim to groupthink.³⁴

In other contexts—for instance, on creative or technical teams such as those common in the tech world—diversity of expertise has essential (and fairly self-evident) benefits.

But there is also evidence to suggest that organization-wide racial/ethnic diversity drives innovation. For example, a 2003 survey of executives at 177 national banks in the U.S. found that a racially/ethnically diverse workforce improved the financial performance of banks that pursued an innovation strategy.

Homogenous groups are more likely to share certain assumptions and perspectives and less likely to identify their knowledge gaps—they

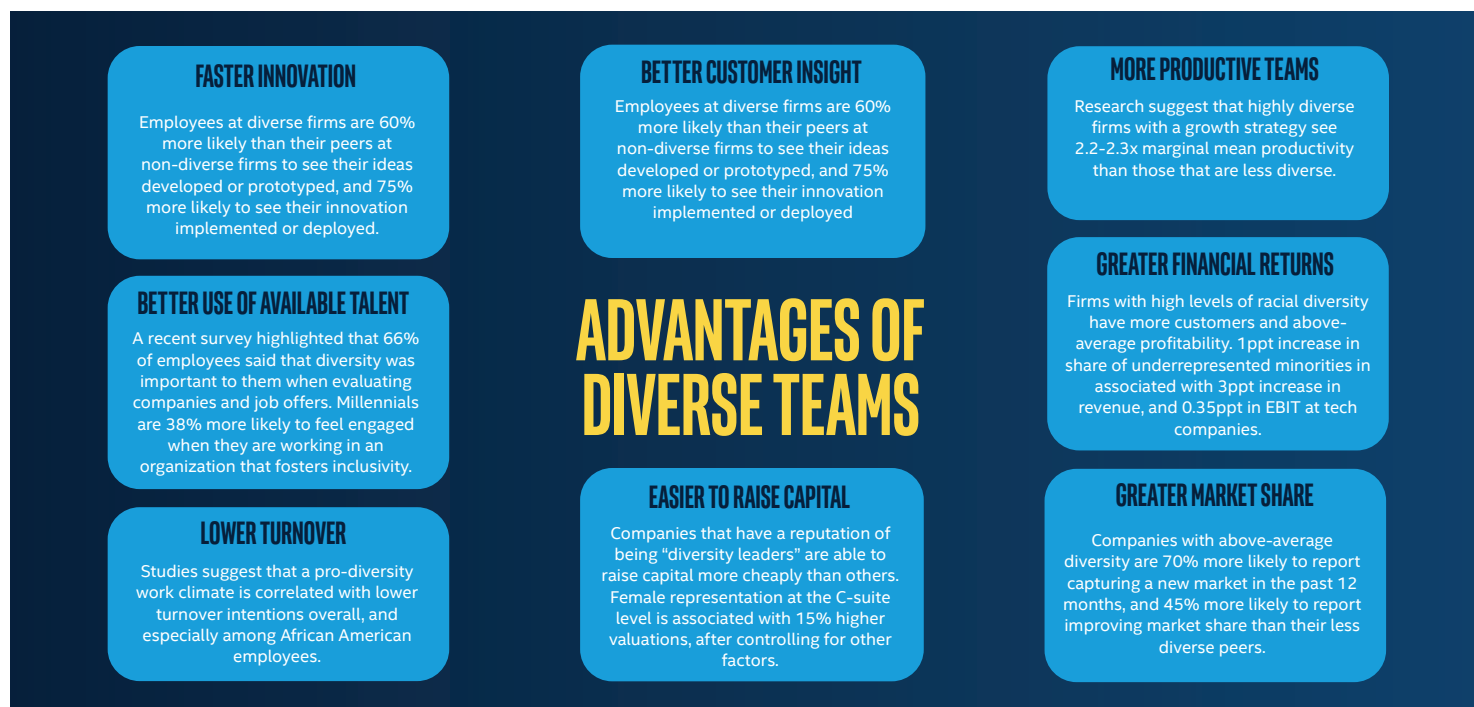
often don't know what it is they don't know (and need to learn). Racially/ethnically diverse teams, in contrast, are likely less susceptible to this bias.

Yet there is another, more subtle factor at work: as Katherine W. Phillips explained in a 2014 review of the literature on diversity in organizations, **“Simply adding social diversity to a group makes people believe that differences of perspective might exist among them and that belief makes people change their behavior.”** One study showed that all-white juries share a narrower range of information with each other than do diverse juries. Another demonstrated that people who were told to convince a partner of a dissenting opinion put more effort into persuading that partner when they believed the person belonged to a different political party. *“When disagreement comes from a socially different person, we are prompted to work harder,”* Phillips writes.³⁵ *“Diversity jolts us into cognitive action in ways that homogeneity simply does not.”*³⁶

For the Millennial generation of workers, a diverse workplace is neither a luxury nor an aspiration—it’s an expectation.

Millennials are 38 percent more likely to feel engaged and 28 percent more likely to feel empowered when they are working in an organization that they believe fosters inclusivity. An overwhelming majority of Millennials prefer not to work at organizations they see as unsupportive of innovation, and 40 percent of these same Millennials see a lack of gender and racial/ethnic diversity as a major barrier to innovation.³⁷ This should come as no surprise. Millennials are, themselves, the most diverse generation in U.S. history.³⁸ More broadly, a 2014 Glassdoor survey found that 66 percent of those polled indicated that workplace diversity was a key factor when choosing among job offers. 57 percent of the respondents in the same survey expressed dissatisfaction with what their company was doing to increase diversity in its workforce.³⁹

Exhibit: Advantages of Diversity



³⁰ Bosetti, Valentina, Cristina Cattaneo, and Elena Verdolini. “Migration, Cultural Diversity and Innovation: A European Perspective,” Innocenzo Gasparini Institute for Economic Research. Dec 2012.

³¹ Kaplan, David M., Jack W. Wiley, and Carl P. Maertz Jr. “The Role of Calculative Attachment in the Relationship Between Diversity Climate and Retention,” Human Resource Management. Vol 50(2), 2011.

³² McKay, Patrick F., et al. “Racial Differences In Employee Retention: Are Diversity Climate Perceptions The Key?,” Personnel Psychology. Vol 60(1), 2007.

³³ Corporate EEO-1 disclosures; Dalberg analysis

³⁴ “The Wisdom of Crowds,” James Surowiecki. Anchor: August 2005.

³⁵ Richard, Orlando, et al. “Employing an Innovation Strategy in Racially Diverse Workforces,” Group and Organization Management, Vol 28(1), Mar 2013. Interestingly, the same study found that for banks that did not prize innovation, performance declined with greater diversity.

³⁶ Phillips, Katherine W. “How Diversity Makes Us Smarter,” Scientific American. Oct 2014.

³⁷ “Mind the Gaps: The 2015 Deloitte Millennial Survey,” Deloitte. 2015.

³⁸ “Millennials in Adulthood,” Pew Research Center. Mar 2014.

³⁹ “Two-thirds of People Consider Diversity Important When Deciding Where to Work, Glassdoor Survey,” Glassdoor. Nov 2014.

The idea that cultural knowledge plays an essential role in building products that minority communities embrace is well documented and widely accepted.

Yet, today the markets that tech companies serve are twice as racially/ethnically diverse as tech company workforces. Moreover, the design firms that advise tech companies are even less diverse; they are, on average, 86 percent Caucasian.⁴⁰

Key markets are becoming more diverse while tech companies are remaining static.

Thirty-one large metropolitan areas in the U.S. are “majority minorities” among under-18 children, including New York, Chicago, and Washington DC.⁴¹ As we look toward the next generation, one thing seems clear: there are significant untapped opportunities to build products that are better at acquiring users among minority communities. Minority consumers spend an estimated \$50 – 55Bn on tech hardware annually, representing approximately 20 percent of the market.⁴² By every measure of value, it is well worth it for the tech industry to pay more—and better—attention to underrepresented minorities.

Economic Returns on Gender Diversity

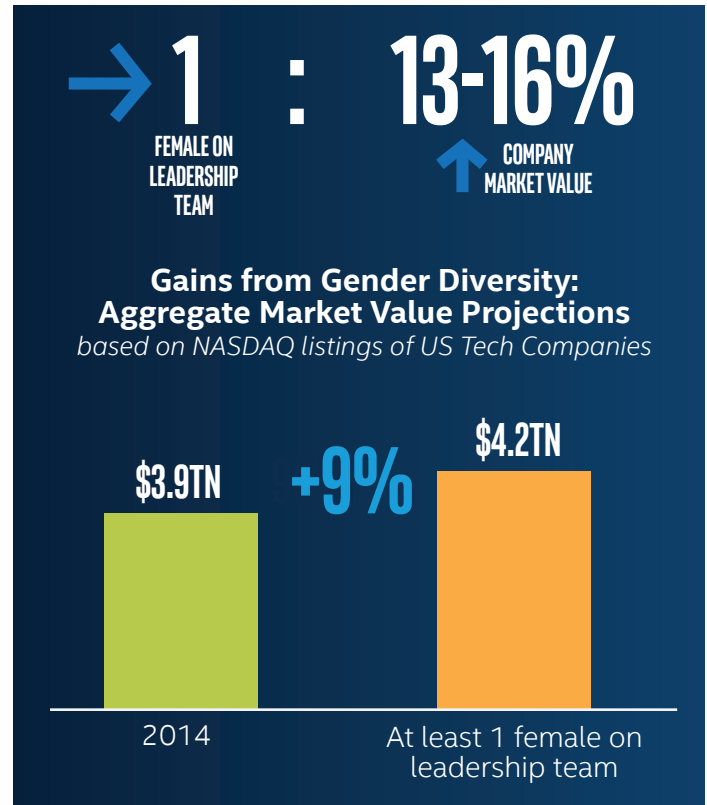
The clearest evidence for linkages between company performance and gender diversity is at the leadership level.

Financial Impact: Mid-sized and Large Tech Companies

The business case for gender diversity in the leadership of the tech industry is strong, and the opportunity is of a similar scale to that presented by achieving racial/ethnic diversity. This report finds that representation at the leadership level (defined as one woman at the senior vice president level or higher) correlates with 13 – 16 percent higher enterprise value controlling for company revenues, profitability, size, and age.⁴³ Among U.S. tech companies, however, just over 30 percent boast any female representation on the leadership team. Globally, across all sectors, an average of 50 percent of companies have at least one female on their leadership team.⁴⁴

If NASDAQ-listed companies were to close this gap, it would correlate with a boost in enterprise value of \$320 – \$390Bn across the sector.

Exhibit: Estimated Returns to Female Representation in Leadership



With other key metrics—such as revenues and profitability—however, efforts to isolate the impact of female leadership were inconclusive.

The lack of conclusive findings in this specific case suggests that further analysis is needed in order to definitely understand the complex effects of gender diversity in leadership on financial performance. Studies in other sectors, however, indicate that female leadership can be linked to higher returns on sales, equity, and invested capital.

⁴⁰ Carroll, Antoinette. “Diversity and Inclusion in Design: Why Do They Matter?” The Professional Association for Design. 2016.

⁴¹ U.S. Bureau of Labor Statistics; Dalberg analysis

⁴² Selig Center for Economic Growth; Nielsen; Dalberg analysis

⁴³ Dalberg Diversity in Tech Database; Dalberg analysis. “Market value” defined as market capitalization, drawn from Compustat data, 2014. Full methodology detailed in annex.

⁴⁴ Noland, Marcus, Tyler Moran, and Barabara Kotschwar, “Is Gender Diversity Profitable? Evidence from a Global Survey,” Peterson Institute for International Economics. Feb 2016.

Financial Impact: Small and Startup Tech Companies

Greater gender diversity could make the most profound impact in the startup world.

Y Combinator, a leading startup incubator, released data highlighting that just 20 percent of the startups it funded have women on the founding team, and only 10 percent of YC-funded companies now worth over \$100Mn are run by women. While Y Combinator itself has made laudable efforts to drive diversity among its startups—the organization has four full-time female partners, holds women-focused events, and has publically declared that it is investing in tackling this issue—these data suggest that startups as a category have an opportunity to grow their market value more quickly by including women in their founding team.⁴⁵

The report also finds that female inclusion on a startup founding team could represent, for an average startup (valued at \$4.2Mn as of March 2016), roughly half a million dollars in higher valuation

given the link between female executive representation and an approximate 15 percent increase in market value.⁴⁶ This has significant implications for a growing company aiming to attract desperately needed capital to fund hiring and infrastructure. From a strictly financial standpoint, founding teams with female representation are worthy of a closer look from angels and venture capitalists. Likewise, entrepreneurs can consider working with women early in the idea generation and product conceptualization process in order to claim some of this diversity dividend.

Research of this nature on the economic impact of women in the tech industry is limited – this is a first of a kind analysis – and reflects an opportunity for industry leaders to fund more analysis to build the case.

However, global studies and research on gender diversity in other sectors are much more prevalent, and support the finding that “women at the top” foster greater value creation than do all-male boards and executive teams. It’s worth highlighting a few of these findings and how they trace the impact of female leadership across a range of metrics.

One study from 2007 found that firms with a high proportion of female officers generated six percent higher return on investment over a three-year period, so long as those firms were operating in what the authors deemed “complex environments”—meaning environments characterized by high volatility in valuations, high market-to-book valuation ratios, and widely divergent forecasts amongst analysts. These factors all apply to the tech industry: volatile, richly-valued, and unpredictable, it is an ideal environment for women’s leadership abilities to drive financial returns.⁴⁷

Companies with three or more women on the board earn 60 percent higher return on invested capital, 60 percent higher return on equity, and 84 percent higher return on sales than do companies led by all-male boards. The study that found these results did not control for a range of potentially confounding factors (for instance, larger, more mature firms may be more likely to have female board members and also realize a higher return on equity by virtue of their size and maturity); however, the size and statistical significance of the results suggests that commitment to diversity among corporate leadership is linked to high performance across a range of financial metrics.⁴⁸

The trend holds with venture-backed firms.

A 2012 Dow Jones study of venture-backed companies over the fifteen-year period ending 2011 labeled as “successful” those that went public or were acquired. Across the companies deemed “successful,” women made up 7.1% of executives, compared to 3.1% female executives at unsuccessful firms. (However, the study does not investigate the reasons for companies’ success or failure, nor does it identify a linkage between success and a specific female-held executive positions.)⁴⁹

⁴⁵ Altman, Sam. “Diversity and Startups,” Y Combinator Blog, Jul 2015.

⁴⁶ Data used from the AngelList Startup Valuation Data Browser, accessed Mar 2016.

⁴⁷ Francouer, Claude, Real Labelle, and Bernard Sinclair-Desgagne. “Gender Diversity in Corporate Governance and Top Management,” *Journal of Business Ethics*. Vol 81, Jul 2008.

Methods in Action

These empirical findings backed by the large body of evidence on the causal chain behind these positive outcomes.

Research has long supported the assertion that as organizational leaders, women show valued leadership traits more frequently and consistently than men. As this angle has been well covered in media, this report will simply touch on a few relevant highlights.

Women score better than men on leadership qualities.

The 2012 *Harvard Business Review* article, “Are Women Better Leaders Than Men?” reported the results of a survey of 7,280 leaders’ evaluations from peers, bosses, and direct reports. Women were rated higher than men in 12 of the 16 competencies associated with exceptional leadership. These advantages reached beyond those traditionally viewed as women’s strengths. For example, women were, as a group, rated significantly higher in “taking initiative” and “driving for results,” two qualities that are particularly prized at small and growing tech companies.⁵⁰

New research continues to reinforce the idea that women exhibit stronger leadership styles.

In a comprehensive 2014 review of gender-based leadership differences, Florida International University’s Samantha Paustian-Underdahl

reviewed over 95 studies and found that women were rated significantly higher than men in business leadership (men rated higher in government), and that although men self-rated more highly, women were rated significantly higher than men in leadership strength.⁵¹

However, gender prejudice may play a role in shaping these results.

Studies highlight that women who reach the executive and board level, in tech and other industries, are consistently held to higher standards than their male peers.⁵² Despite the fact that women earn 18 percent of all computer science degrees and 37 percent of all MBAs, only 14 percent of tech companies have women in any chief executive role.⁵³ In practice, this means that women who reach leadership positions in tech companies have been “preselected” for exceptional capacities.

Leadership is not the only aspect of gender diversity that can provide companies a distinct advantage.

In other sectors, it isn’t particularly controversial to point out that women are often better equipped to design products that women will want to use. There is evidence that this holds true in tech as well. Tech companies building new products are more likely to reach bigger markets if women are helping to design them.



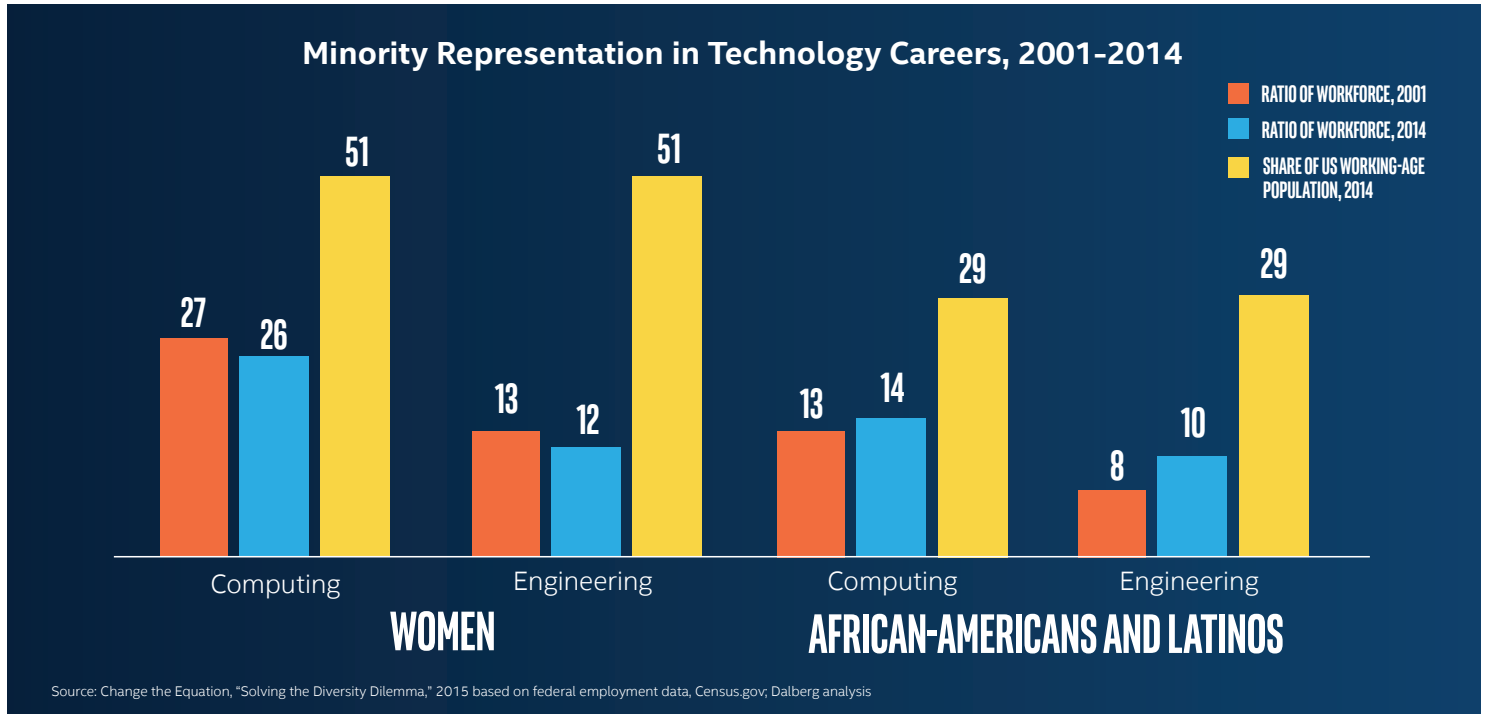
CHAPTER 4. MORE EVIDENCE, MORE DIVERSITY

The Search for Root Causes

Tech companies have invested between \$0.8 – 1.2Bn in diversity initiatives over the past five years,⁵⁴ and some firms can point to slow but steady improvements.

Yet there is still much progress to make toward achieving diversity that reflects the pool of available talent, aligns with the makeup of the populations the industry serves, and realizes the dividends in productivity and innovation associated with more inclusive workspaces.

Exhibit: Long-term Changes in Diversity at Leading Tech Companies



Until now, most of the debate surrounding this lack of progress has focused on identifying a root cause, the implication being that only by isolating this cause could the industry collectively identify the "right" solution. Three candidates have repeatedly surfaced as the potential root cause: "visibility," "pipeline," and "culture."

Exhibit: Root Causes of Diversity Challenges in Tech

ROOT CAUSES OF DIVERSITY CHALLENGES IN TECH

- VISIBILITY**
Some advocates believe that a lack of role models and limited exposure to careers in technology for young women and racial/ethnic minorities in leadership roles discourage students from seeking, and employees from advancing, their own careers in technology.
- PIPELINE**
Other advocates believe that tech companies are constrained by a lack of diverse pool of qualified candidates - 12% of computing degrees go to women and it is similarly low for African Americans and Hispanics. Efforts are focused at improving the supply of underrepresented candidates with computing skills, yet candidates are still hired at a slower rate.
- CULTURE**
Research into the experience of women and ethnic minorities at tech companies shows that they feel excluded, in an unsupportive environment where they receive less attention or are asked to make greater personal sacrifices than their peers. Former employees are most likely to cite the lack of an inclusive work environment as the reason for leaving.

Despite the scale of investment and investigation, however, the picture is far from clear. Each of these three elements is backed by evidence supporting its major role in hindering diversity in the tech workforce.

This report does not aim to resolve this debate. Interviews with diversity experts across the corporate and public sectors suggest that lack of diversity is driven by a combination of these three, and that tech's diversity challenges are too complex to be traced to a single root.

More importantly, the extended debate over these root causes has not achieved the results that companies urgently seek.

One of the main reasons is a shortage of proven approaches. What this report aims to demonstrate is that no matter what the “true” root cause might be, change is possible by using, replicating, and scaling data-based approaches.

Actions that we know to be effective, beyond a shadow of a doubt, are still few and far between—again, despite widespread investment and experimentation. But the potential remains for specific activities that advance diversity and are founded on a solid body of rigorous evidence. To understand the impact that evidence-based approaches to diversity can have, it's instructive to study the lessons that have emerged from another community of practice: evidence-based management.

Evidence-Based Management

Evidence-based management is, in short, the belief that managerial decisions should be based on confirmed knowledge of what is effective.

In recent years, evidence-based approaches to management have completely overhauled our understanding of what it takes to be a great manager of people. From the analytical, “sabermetric” approach to baseball team-building chronicled in Michael Lewis's *Moneyball* to Lazlo Bock's *Work Rules*, an ever-increasing body of research is helping managers to discard outmoded approaches and implement data-driven practices that are shown to be effective.

Often these outmoded practices were based on a mix of theory, instinct, and partial information passed along through networks, not dissimilar to how investments in diversity advancement are made today.

For example, numerous studies have shown that team performance improves with time, continuity, and deepening cooperation.

This evidence argues against adopting a “forced-ranking approach” to reviewing employees.⁵⁵ A wide body of evidence also highlights the tendency of well-rated managers to rely more heavily on people skills than technical skills.⁵⁶ Yet many companies continue to “rank and yank” their employees using a bell curve system, and many weigh technical abilities at the same level as interpersonal skills when considering staff for promotion to manager.

The reasons why managers don't use the evidence contain lessons that are applicable to advancing data-based diversity approaches in tech.

Often companies have plenty of evidence, but lack a method of separating the good evidence from the bad or useless. In addition, conflicting incentives are built into the way companies engage experts and advisors to train managers. Managers themselves are susceptible to confirmation biases, in some cases rewarding the qualities they favor in an employee, regardless of whether or not those traits are most effective. Finally, anecdote- and metaphor-driven management philosophy has one big advantage on evidence-based management: human beings tend to be more naturally persuaded by narrative than by data.

By investing now in the effective collection and sharing of evidence on how to advance diversity effectively, the tech industry has a crucial opportunity to improve its approach in the future.

A handful of organizations are sponsoring efforts to collect rigorous evidence on diversity advancement approaches in tech, and have begun to unearth some surprising findings.

Retention and Recruiting

Diversity training turns out to be the least effective of several approaches to improving diversity and eliminating managerial bias.

In fact, a systemic analysis of 708 companies from 1971 – 2002 found that diversity training produced “no positive effects in the average workplace.” Addressing isolation through mentoring and networking were only modestly effective, and creating structures to establish responsibility among line managers—affirmative action plans, targets, and oversight committees—were most effective. In short, managerial responsibility trumps training, networking, and mentoring.⁵⁷

Yet mentoring does help.

For minority employees (racial/ethnic and gender), having a sponsor who not only provides support and mentorship as a role model but also proactively advocates on their behalf makes protégés feel more connected to their company, and reduces workplace stress. This mentorship is most effective if and when it evolves to sponsorship.⁵⁸ The key differences between a mentor and a sponsor? A sponsor advocates for someone to be more visible, more recognized, and engaged in a way that suits their unique skills. A mentor provides guidance, advice, and wisdom, but does not necessarily advocate on one’s behalf.

Research by CTI shows that sponsors make a difference in three key areas: pay raises, high-visibility assignments, and promotions:

- Just 30 percent of women will confront their boss to ask for a raise. With the support of a sponsor, however, that figure jumps to 38 percent. Separate findings from focus groups suggest that these women will get the raises they request
- Just 36 percent of unsponsored women will ask their manager to be assigned to a high-profile team or a highly desirable project; with a sponsor in their corner, 44 percent will ask

- 68 percent of women with sponsors are satisfied with the pace of their progress at their company, compared to 57 percent of women without sponsors—a 19 percent “sponsor effect.” Even more striking: 85 percent of sponsored, full-time employee mothers maintain their path toward career advancement, compared to just 58 percent of those mothers without sponsorship—a 27 percent sponsor effect

Yet, although 72 percent of executives and C-suite leaders say they’re looking for protégés who assume responsibility and are self-directed, only 14 percent of women in tech can say with conviction that they have a sponsor at their workplace.

Another finding: eliminating “fit” criteria in the hiring process reduces opportunities for bias

Several randomized control experiments of women and racial/ethnic minorities in tech have tested reactions to candidates with resumes in every respect except the name at the top—male or female, and seemingly Caucasian, African American, or Hispanic. The bias is real: results consistently show that the “female” and “minority” applicants are rated significantly lower for competence, hire-ability, and whether they are of interest for mentorship. “Fit” is a nebulous qualification that is open to subtle—even unconscious—prejudice.^{60 61}

⁴⁸ Carter, Nancy, et. al. “The Bottom Line: Corporate Performance and Women’s Representation on Boards,” Catalyst. Oct 2007.

⁴⁹ Tozzi, John. “Women Help Startups Succeed. When Will VCs Take Notice?” Bloomberg Business. Oct 2012.

⁵⁰ Zenger, Jack and Joseph Folkman. “Are Women Better Leaders Than Men?” Harvard Business Review, Mar 2012.

⁵¹ Paustian-Underdahl, Samantha C., Lisa Slattery Walker, and David J. Woehr. “Gender and Perceptions of Leadership Effectiveness: A Meta-Analysis of Contextual Moderators,” Journal of Applied Psychology. Vol 99(6), 2014, 1129-1145.

⁵⁵ Pfeffer, Jeffrey, and Robert Sutton, “Hard Facts, Dangerous Half-Truths and Total Nonsense: Profiting from Evidence-Based Management,” Harvard Business School Press. 2006.

⁵⁶ Lee-Kelley, Liz and Kin Leong, “Turner’s five-functions of project-based management and situational leadership in IT services projects,” International Journal of Project Management. Vol 21(8), Nov 2003.

⁵⁷ Kalev, Alexandra, Frank Dobbin, and Erin Kelly, “Best Practices or Best Guesses? Assessing the Efficacy of Affirmative Action and Diversity Policies,” American Sociological Review. Vol 71, 2006, 589-671.

⁵⁸ Ibid.

⁵⁹ Hewlett, “Innovation, Diversity, and Market Growth,” CTI. 2013.

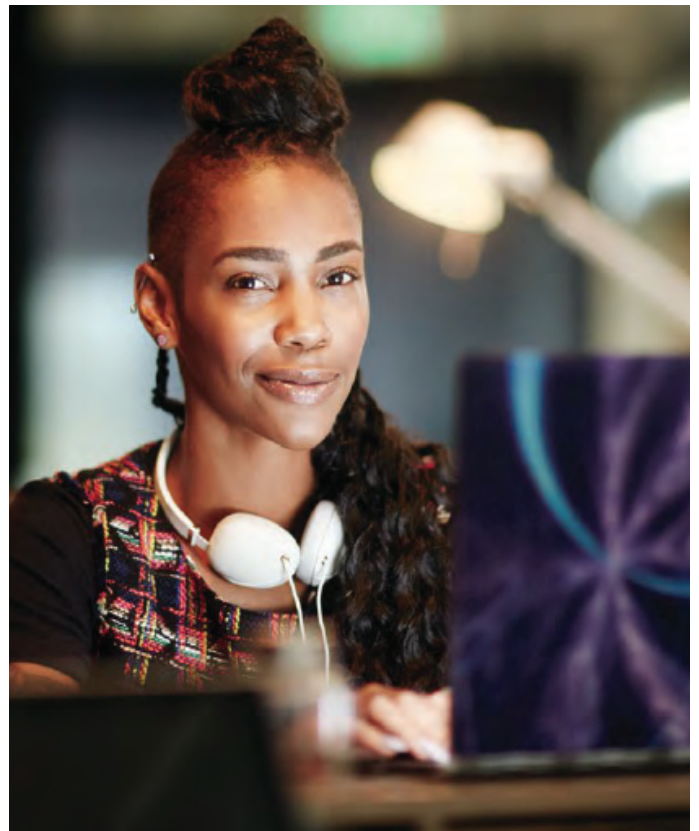
Finally, word choice matters in job listings.

A series of recent studies highlight the fact that job listings for positions in engineering and other predominantly male professions tend to use more masculine words such as “dominant,” and “competitive.” Women are statistically less interested in applying to these roles, even if they believe they are qualified for the position.

Intel's Diversity in Technology Initiative

Intel has gained significant attention for its ambitious goal of being the first high technology company to reach full representation of women and underrepresented minorities in its US workforce by 2020. The company has committed \$300Mn to achieving this goal, and has invested in efforts across its value chain to advance diversity and inclusion. Some of Intel's notable initiatives include:

- Expanding the STEM Pipeline:
 - Latinos in Technology Scholarship Initiative: A pledge of \$3.75Mn over five years to support 125 scholarships for Latino college students who have chosen a science, technology, engineering, or math major, in partnership with the Hispanic Foundation of Silicon Valley
 - Next generation of Native American Coders: An investment of \$750,000 over the next three years to implement a comprehensive education transformation at three Arizona high schools in the Navajo Nation
 - Georgia Tech: A \$5Mn partnership with Georgia Tech to support approximately 1,100 underrepresented minorities over the next five years, including scholarship support and peer-to-peer tutoring
 - Oakland Unified School District: A commitment of \$5Mn over five years to strengthen the computer science and engineering pathway curriculum at two of OUSD's high schools
- The Intel Diversity Capital Fund: A fund designed to invest \$125Mn over five years in a broad spectrum of innovative companies with founders/CEOs—or at least three members of the senior management team—who are women and/or underrepresented minorities
- Increasing Supplier Diversity: A commitment to spend \$1Bn annually with diverse-owned businesses
- Inclusion in Gaming: Sponsorship of Indiecade and GaymerX to support the work of independent and diverse game developers, partnership with Drexel University on a nationwide game design contest with a focus on engaging middle school girls, the Intel challenge – a tournament for the world's top women's gaming teams – and leadership in an industry wide campaign called #HackHarassment focused on united tech community to provide safer, more inclusive online experiences



⁶⁰ Bouton, Katie. "Recruiting for Cultural Fit," Harvard Business Review. Jul 2015.

⁶¹ Yurkiewicz, Ilana. "Study shows gender bias in science is real. Here's why it matters," Scientific American. Sep 2012.

⁶² Gaucher, D., J. Friesen, and A. C. Kay. "Evidence That Gendered Wording in Job Advertisements Exists and Sustains Gender Inequality," Journal of Personality and Social Psychology. Mar 2011.

Education

Substantive improvements in the design of college curricula matter, as does extracurricular support.

Harvey Mudd College in Southern California has found success with several initiatives to interest more female students in computer science (CS).

- Redesigning and renaming introductory courses to highlight the ways in which computer science can offer solutions to real-life challenges across a range of fields, from transportation to politics to medicine to entertainment. For example, the introductory CS course changed from “Introduction to Programming in Java” to “Creative Approaches to Problem Solving in Science and Engineering Using Python.”⁶³
- Instituting simple rules to improve the social climate within classrooms, such as working with instructors to actively encourage young women in the class to speak, while downplaying input from students that could intimidate others
- Hiring additional female CS faculty, and ensuring they all make contributions to teaching introductory-level courses
- Encouraging networks of faculty and peer support
- Taking students to the Grace Hopper Celebration of Women in Computing conferences to help students see the broader community they are a part of, link up with recruiters, and identify potential role models

As a result, the number of women taking computer science courses at Harvey Mudd increased from 13 in 2010 to 117 in 2015.⁶⁴

⁶³ Interview with Dr. Maria Klawe, President, Harvey Mudd College

⁶⁴ Ibid.

⁶⁵ Chang, Lulu. Stanford women set to reclaim their place in the field of computer science,” Digital Trends. Oct 2015.

⁶⁶ Female enrollment exceeded male enrollment for the first time since the school kept records. “Tech shift: More women in computer science classes,” SF Chronicle. Feb 2014.

Harvey Mudd is not alone in making significant progress on this front.

At Stanford University, for example, computer science became the major of choice for women in 2015.⁶⁵ Since the late 1990s, meanwhile, Carnegie Mellon University, has been developing initiatives such as its big sister / little sister program, which paired upper-class tech students with freshmen, and shifting admissions criteria from those that favor past programming experience to those that value demonstrated potential (e.g., a combination of math, science, and leadership aptitude). In 2014, 40 percent of the incoming class in Carnegie Mellon’s computer science program was female.

Class descriptions also matter.

If you want to engage underrepresented students, and improve the hiring pipeline for tech companies, even small changes in the way a school communicates course content can have an impact. Take the case of the University of California Berkeley. During the spring 2014 semester, an introductory computer science course formerly called “Introduction to Symbolic Programming” was renamed “Beauty and the Joy of Computing.” Female enrollment increased by 50 percent; for the first time more women than men enrolled in the class.⁶⁶





CHAPTER 5. OPPORTUNITIES

Major investments made by leading tech companies—together with actions taken by government, schools, and NGOs—have begun to weaken barriers to racial/ethnic and gender diversity within the tech workforce.

As these leading tech companies fulfill their commitments to invest in diversity over the coming years, and as other companies hopefully match and exceed these commitments, it will be critical to ensure that these resources go to support activities based in robust evidence. It will also be essential that these efforts lead to industry-wide learning on how to maximize diversity gains and create a more inclusive workforce.

The opportunities for tech companies to take action on diversity fall into three broad categories: (1) collaboration and knowledge exchange, (2) new research, and (3) evidence-backed investments that can be made right now to improve workforce diversity.

Many tech companies are already funding some of these types of investments—for these firms, the opportunities discussed below can serve as guideposts to help ensure that diversity officers are investing in the full range of potentially impactful activities, and as the basis for collaboration among multiple stakeholders. For companies that have not yet considered focusing or investing in these areas, these opportunities can serve as inspiration for action.

(1) Opportunities for Collaboration and Knowledge Exchange

Investments to improve diversity will be much more effective when tech companies collaborate with their partners and suppliers, civic and educational organizations, and government agencies.

Each of these stakeholders has a vested interest in expanding the participation of women and underrepresented racial/ethnic minorities in tech careers that will nurture and reward their talents. Without coordination, opportunities will be missed to learn from successes and failures, stakeholders will duplicate efforts, and a shared accountability will be difficult for the industry to establish. The efforts already made by industry leaders on diversity are worth celebrating, but the opportunity exists to multiply these efforts many times over through deeper collaboration.

Gathering and sharing benchmarking data is an essential first step toward better understanding the nature of the diversity gap—as well as pinpointing where, and why, the industry is making progress. Sharing these figures will not only improve accountability on inclusion, but can also reinforce the status of a company as an industry leader seriously committed to advancing diversity, with the benefits that entails for recruitment, retention, and raising capital. Sharing EEO-1 data is a good start, but tech companies can signal an even stronger commitment to diversity goals by collecting and sharing a more nuanced and thorough dataset.

Beyond what is already available through the EEO-1, companies could track and share the proportion of underrepresented minorities⁶⁷

- at the company level and business unit level
- in product development compared to non-development tracks
- in promotion and retention figures
- by employment tenure, and
- in executive development and leadership programs

Just as illuminating would be any shared insight into why underrepresented minorities decide to leave a company, as well as the rationale for when and why they are promoted, chosen or rejected from interview pools, and chosen or rejected through résumé screenings.

Collecting and sharing diversity data also enables a company to better analyze and address gaps in its workforce.

For example, predictive analytics can help HR directors get ahead of the curve and develop strategies to improve the work conditions of those employees that are at greatest risk of leaving.

In addition to data on representation, it would be helpful to better understand the kind of work that women and other underrepresented groups are doing.

Do their roles allow them to take ownership or innovate projects? To apply for patents? To what extent are they represented among leadership, or in key technical and creative roles.

Exhibit: EEO-1, Section D: Current Structure and Possible Additions

		Number of employees												
		Race/ethnicity												
		Hispanic or Latino		Not Hispanic or Latino							Female		Total	
				Male										
		Male	Female	White	African American	Pacific Islander	Asian	Native American	Multi	White	African American	...		
Roles	Total													
	Executives/ Senior Managers													
	Mid-level Managers													
	Technicians													
	Sales													
	Admin													
Diversity/Engagement	Yes													
	No													
Changes	Average tenure													
	Recruited													
	Promoted													
	Exited													
Training	In leadership programs													
	...													

Source: US EEOC, Delberg interviews, Delberg analysis.

Current structure of EEO-1, Section D

Possible additions

(2) Opportunities for New Research

Companies can also invest in building a more robust evidence base by funding new studies, drawing on input from researchers who focus on diversity interventions.

The approaches laid out in the next section of this chapter are well established, but experimentation with other lines of inquiry could yield new insights on achieving tech equity and inclusion. For example, there have been promising experiments in unconscious bias training, building norms around soliciting input from minority group members, shifting recruitment budgets to HBCUs, and doing business with suppliers led by underrepresented minorities. Sharing rigorous data on the outcomes (and costs) of new experimental approaches can help the sector improve the effectiveness of its investments in diversity. New research can catalyze more innovation and accelerate progress—a pattern the tech industry knows well.

Studies on a range of other diversity advancement strategies would be useful, including:

- What are effective approaches to making managers accountable for diversity goals, whether through internal transparency, performance reviews, or even compensation
- How do various strategies to slowing minority turnover rank in terms of effectiveness? Which is most likely to be effective? Least likely
- How can discussions of “fit” in the interview process be redesigned or reimaged to avoid confirmation bias
- What are the most effective changes companies can make to employee performance criteria in order to control bias
- What is the ROI on shifting recruiting budgets to fund activities at colleges and universities with higher proportions of underrepresented minorities

- How successful are minority-focused coding boot camps at driving diversity among full-time tech employees
- How is diversity impacted when companies set up offices outside of Silicon Valley
- Are there other effective ways to credential applicants for entry-level tech jobs than the traditional review of college(s) attended, classes taken, and internships completed

(3) Opportunities to make evidence-backed investments

The following eight interventions are activities that some business leaders are already undertaking—and that others can choose to adopt—in order to advance diversity in the tech workforce.

The first of these interventions is the most likely to advance diversity at the most tech companies—the weight of evidence behind it, in particular, is undeniable. The evidence bases supporting the other seven opportunities are not as robust, yet still send clear signals that these are approaches with the potential to move the needle on diversity in tech.



Exhibit: Evidence-based actions that advance diversity, and their effects

1	HOLD MANAGERS ACCOUNTABLE	Significantly more effective than training, networking, and mentoring
2	REDESIGN THE RECRUITING TOOLKIT	Increases minorities' desire to apply, sense of belonging, belief they can succeed
3	BUILD MENTORSHIP INTO SPONSORSHIP	Increases likelihood minorities will remain and advance at a company
4	ELEVATE AFFINITY GROUPS	Increases retention of women
5	COMBAT UNCONSCIOUS BIAS	Improves job satisfaction and thereby retention among minorities
6	ELIMINATE COVERT PENALTIES FOR FLEX WORK PROGRAMS	Improves intentions to stay on the job, job commitment, and job satisfaction
7	COLLABORATE WITH OTHER COMPANIES TO DRIVE ACTION	Could help to move the needle on board representation
8	WORK WITH EXPERTS TO IDENTIFY EDUCATION INVESTMENTS	Expands pipeline of talent, so long as the right types of programs are funded

1. Hold business managers accountable for diversity goals.

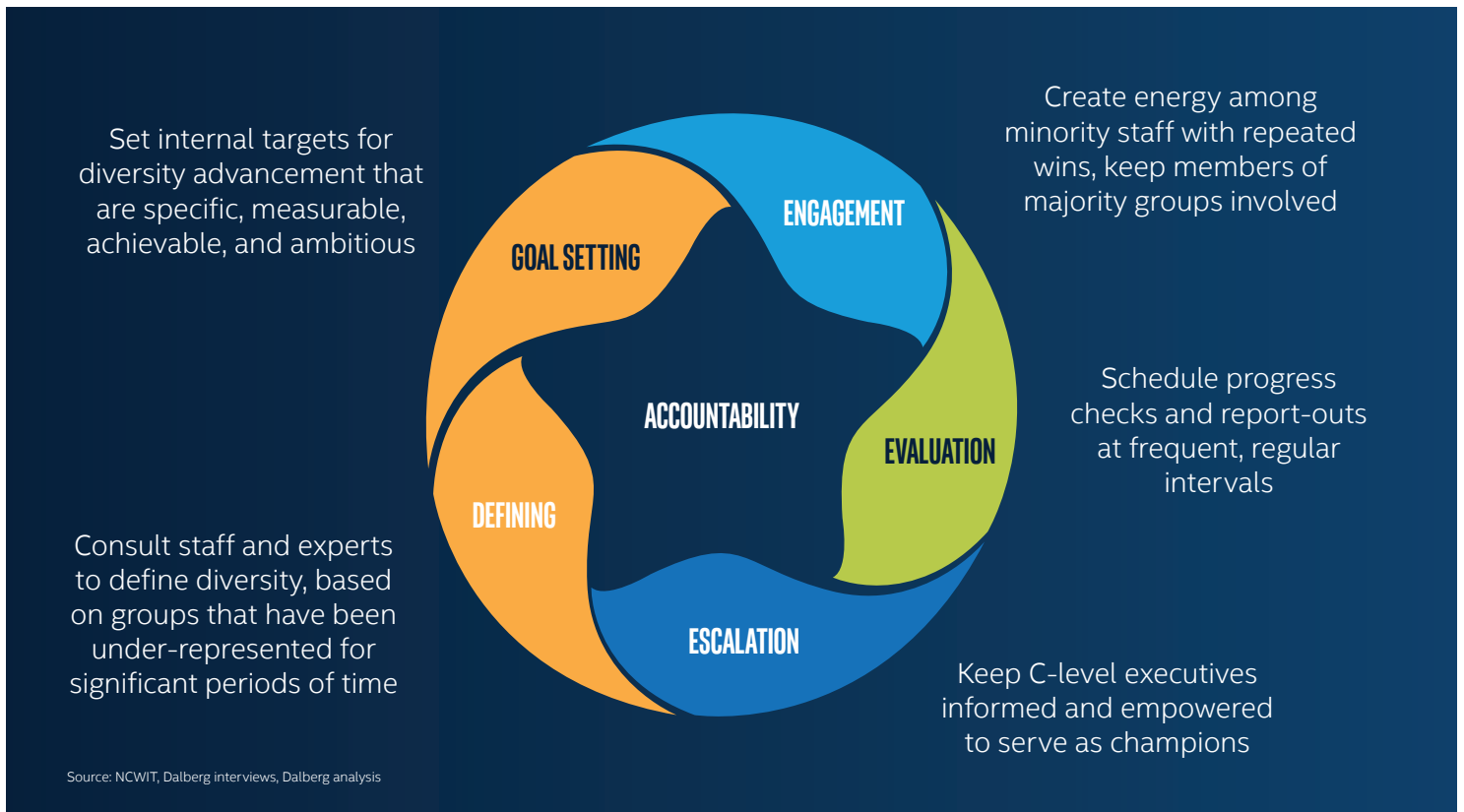
In one of the most comprehensive studies of the effectiveness of diversity practices, sociologists Alexandra Kalev, Frank Dobbin, and Erin Kelly analyzed workforce data of 708 companies over 31 years, and found the key ingredient for successful diversity initiatives: accountability. Companies that outperform their peers in improving diversity typically empower a council of business leaders from departments across the organization (not just HR staff) to implement inclusionary initiatives. Once they've developed metrics to track progress toward inclusion goals, company leaders can establish clear systems of accountability that incentivize managers to identify and nurture underrepresented talent.

This could involve creating real-time dashboards (as some companies have done) with linkages to performance review and executive compensation. While bias training, support programs, affinity groups can work well to improve workforce diversity, making managers responsible for outcomes on their teams is the best way to ensure that approaches are calibrated and progress is realized.

⁶⁷ The "Industry Change Model," developed by the National Center for Women and Information Technology (NCWIT), can help tech companies track and share these data.

⁶⁸ Kalev, Dobbin, and Kelly write: "...organizations that establish responsibility see better effects from diversity training and evaluations, networking, and mentoring." Also: "Structures that embed accountability, authority, and expertise (affirmative action plans, diversity committees and taskforces, diversity managers and departments) are the most effective means of increasing the proportions of white women, black women, and black men in private sector management." Kalev, "Best Practices or Best Guesses?" 2006.

Exhibit: Drivers of Organizational Accountability



2. Build toolkits that attract women and underrepresented ethnic minorities into the recruitment pool. Companies can work to:

- i. Reevaluate job post descriptions. Language matters, and gendered wording can attract or repel candidates. Even small changes like replacing “hacker” with “developer” or “strong” with “proficient” can make a big difference. There is, of course, no universal “right answer” for the best way to word a job listing, but as a useful starting point, companies can pay particular attention to avoiding aggressive, masculine language as well as lists of “nice-to-have” qualifications that are not strictly necessary as a prerequisite for the job. If the goal is to bring people from diverse backgrounds into the interview room, the more a job description sounds like an invitation to apply (and the less it can be construed as an effort to weed out applicants), the better.
- ii. Establish recruiting programs at colleges that have not been traditional pipelines to the tech industry, such as women’s colleges and HBCU; link up with vocational training programs such as coding schools that have a higher share of underrepresented candidates than the conventional top tech universities. Google’s “Google in Residence” program at Howard University, in which a software engineer teaches computer science classes, has begun to pay dividends, with Google hiring two Howard students after graduation—the first candidates Google has hired from an HBCU.
- iii. Make interviews as inclusive as possible. In practice, this might include a) ensuring interviewees are made aware of their potential unconscious biases, b) ensuring that the interview panel is more racially/ethnically diverse and consistently includes women, and c) avoiding bias toward those who are more upfront about their accomplishments by having interviewers take longer and more detailed notes during initial phone interviews.

The evidence supports the effectiveness of each of these actions. For example, a 2013 analysis of behavior change in hundreds of sports referees conducted by the National Bureau of Economic Research highlighted that making these officials aware of their unconscious racial/ethnic biases eliminated those biases almost completely. Moreover, a 2015 meta-analysis in the *Journal of Applied Psychology*, across a sample size of 22,348 individuals, highlights that gender bias is reduced when interviewers are provided additional information that indicates applicants' high degree of competence.⁷³

- iv. Consider gender- and race/ethnicity-blind applicant tracking systems. Although these data can be monitored and aggregated for the purposes of diversity reporting, there is evidence to suggest that a "blind" applicant tracking process has the potential to increase the number of diverse candidates by eliminating biases. For example, a study published in *BioScience* highlighted what happened when administrative staff redact names, pronouns, fellowship information, and awards that might reveal gender or racial/ethnic information. Once this information was redacted, résumé readers were no better at guessing each applicant's gender or race/ethnicity than random chance, eliminating the possibility of unconscious bias seeping into the selection process.⁷⁴

3. Build on existing mentorship programs to formalize sponsorship programs for talented and qualified individuals from underrepresented groups.

Sponsorship goes beyond the teaching and nurturing; it requires that sponsors publicly take on the role of advocates for their protégés and their protégés' work. Research shows that women and ethnic minorities who can identify at least one sponsor within the company are more likely to remain with the firm—and more likely to advance.⁷⁵ The effects of mentorship alone are less clear. Programs that focus on leadership development can also offer underrepresented employees insight into the unwritten rules that guide the tech workplace. To make the most of the talent of their workforces, companies can create well-structured talent development programs with a focus on key diversity gaps.

Some tech companies have recently launched internal sponsorship initiatives to help facilitate women's advancement internally, which not only tap talented minorities and women but also engage Caucasian men as advocates and sponsors. These initiatives provide links to senior leaders who can help open doors and can guide up-and-comers through development plans and mentorship.

4. Put affinity group promotion and expansion on the executive agenda.

In practice, this means management takes steps to provide affinity groups visibility in the overall company by promoting them in the company's internal communications, dedicating resources to them for the long term, and empowering them to make decisions and organize activities. Fifty-eight percent of HR and diversity and inclusion (D&I) leaders claim that affinity groups (also called employee resource groups, or ERGs) at their company contribute to driving inclusion and engagement.⁷⁶ Social science research also demonstrates that networking programs, typically intended as a remedy for social isolation, can also help increase gender diversity at the managerial level, although the effect is modest.⁷⁷ One of these studies, drawing on a sample size of 16,265 annual observations of diversity at private companies across the U.S., found that affinity groups improve the chances at any given company that Caucasian and African American women will be heavily represented.⁷⁸

⁶⁹ Gaucher, "Evidence That Gendered Wording," Mar 2011.

⁷⁰ For further suggestions, see NPM, Inc's recruitment guidelines, found here: <http://seldo.tumblr.com/post/122974308830/excerpt-from-npms-recruitment-guidelines>

⁷¹ "Google Looks to Black Universities for Diversity," VOA News. Mar 2016.

⁷² Pope, Devin, Joseph Price, and Justin Wolfers. "Awareness Reduces Racial Bias," NBER Working Paper. Dec 2013.

⁷³ Koch, Amanda J., Susan D'Mello, and Paul Sackett. "A meta-analysis of gender stereotypes and bias in experimental simulations of employment decision making," *Journal of Applied Psychology*. Vol 100(1), Jan 2015, 128-161.

⁷⁴ Jones, Cynthia and Mark Urban. "Promise and Pitfalls of a Gender-Blind Faculty Search," *BioScience*. Vol 63(8), 2013, 611-612.

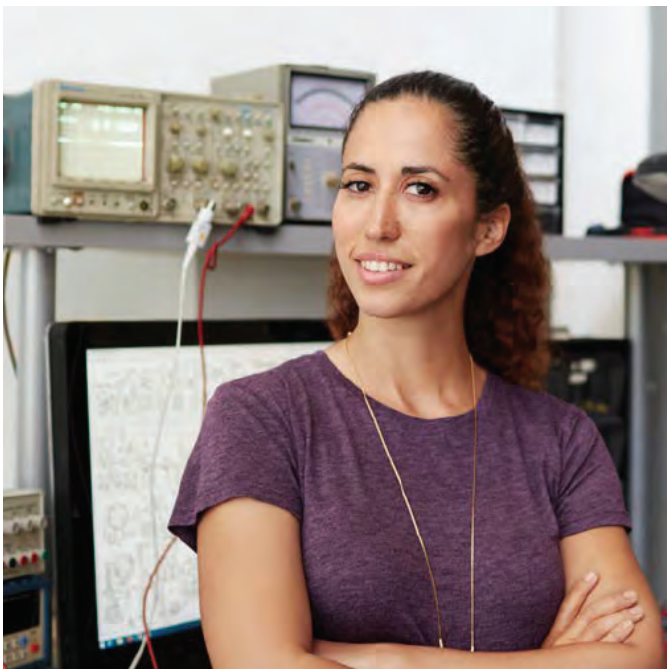
⁷⁵ Hewlett, Sylvia Ann and Laura Sherbin. "Athena Factor 2.0: Accelerating Female Talent in Science, Engineering & Technology". Center for Talent Innovation. 2014.

5. Recognize meritocracy while establishing basic guidelines for interaction that counter unconscious bias.

The culture of Silicon Valley is rooted in a belief in meritocracy distinct from credentials, connections, or lineage: some people have greater abilities and ideas than others; those who do will claim the greater responsibility and reap the rewards commensurate with their talent and effort. Yet even while embracing what is best in this credo, it's also important to recognize that as human beings, we all carry a set of biases and subjective opinions about the world. As a result, two equally competent and well-trained tech executives can differ on what constitutes "better" when examining a team member's abilities. Complicating the picture, a growing body of research points to the likelihood that some of these biases are unconscious—they shape our behavior even when we are unaware of their existence

Meetings and informal workplace interactions are by no means exempt from unconscious biases, however unintentional.

Yet a host of evidence supports the idea that unconscious bias damages workplace diversity and reduces employee job satisfaction.⁷⁹ There are, however, a number of fairly unobtrusive steps that leaders and colleagues alike can take to improve the workplace for all team members.



These could include introducing norms such as ensuring that all team members have an opportunity to speak, actively seeking the opinions of more reticent employees, and taking pains to guarantee that the credit for good ideas and good work is given to deserving individuals (and not necessarily the most outspoken). Incorporating such guidelines as a best practice helps develop a comfortable "speak-up" culture that mitigates biases and make the most of employees' contributions. Approximately 20 percent of large U.S. companies offer unconscious bias training today, and diversity consultants expect that ratio to grow to 50 percent by 2020.⁸⁰ It is important to distinguish this training from traditional "diversity training," which has been demonstrated to be largely ineffective. The latter focuses on making people conscious and accepting of differences between themselves and others. The former focuses on making people conscious of the implicit beliefs they have about others, which often cause them to perceive "differences" that do not exist in reality. A good place to start is with managers. By helping managers identify and address the biases that may be guiding the way their decisions shape the environment in which their employees work, companies can make significant progress toward changing a work culture too often criticized for rewarding brash or insensitive behavior.

“Almost all women in the tech industry don’t believe it’s a meritocracy. That’s a real myth.”

–Dr. Telle Whitney, CEO of the Anita Borg Institute

⁷⁶ Catalyst ERG Survey 2015

⁷⁷ Kalev, "Best Practices or Best Guesses?" 2006.

⁷⁸ Ibid.

⁷⁹ McCormick, Horace. "The Real Effects of Unconscious Bias in the Workplace," UNC. 2015. Lund, Daulatram B. "Organizational culture and job satisfaction," *Journal of Business & Industrial Marketing*. Vol 18(3), 2003, 219-236. Pritchard, Robert D., Bernard W. Karasick. "The effects of organizational climate on managerial job performance and job satisfaction," *Organizational Behavior and Human Performance*. Vol 9(1), Feb 1973, 126-146. Yiing, Lee Huey and Kamarul Zaman Bin Ahmad. "The moderating effects of organizational culture on the relationships between leadership behavior and organizational commitment and between organizational commitment and job satisfaction and performance," *Leadership and Organization Development Journal*. Vol 30(1), 2009.

6. Eliminate overt or subtle repercussions for staff taking advantage of flexible work programs.

Research suggests that workplace flexibility enhances employee engagement and leads to longer job tenure.⁸¹ For example, a 2013 meta-analysis of 57 studies in the *Journal of Applied Psychology* confirmed that the availability and use of work-life support policies had modest positive relationships with intentions to stay on the job, commitment to the job, and satisfaction.⁸² Companies can strive to create a flexible work environment by instituting policies that ensure adequate time off, provide and support career flexibility (especially for new parents), offer support for personal responsibilities such as caring for a family member, and accommodate cultural and religious needs. While much of this is well known, and the official work policies of many companies are quite flexible, the reality is that many employees risk the disapproval of their managers and/or peers for availing themselves of such policies. Companies can combat this tendency by actively encouraging both men and women to use the flexibility guaranteed by company policies, and by looking into performance evaluation and promotion processes to make sure there is no pattern of bias against those employees who choose to exercise their rights.

7. Use influence to motivate action among partners.

Apart from the internal initiatives tech leaders can sponsor, they also have the opportunity to extend their influence as stewards of the sector to help their peers and partners advance diversity in their respective organizations. Industry leaders can use their intellectual, social, and financial capital to encourage partner action in a number of ways:

i. Convene and participate in CEO summits. Dozens of larger tech companies have already made public commitments to diversity; if hundreds of small tech firms can follow suit, the effect will be multiplied many times over.

CEOs of companies already making this move can help clarify to their counterparts across the industry the importance of having women and minorities in tech, document what their presence bring to the industry, and share best practices in attracting and retaining them. These leaders also have the ability to organize regular forums and roundtables on such specific challenges as improving the pipeline, executive development, mitigating bias, developing accountability, improving workforce metrics, and other topics in which they can coach their peers and partners on how most effectively to take positive steps toward greater inclusion.

ii. Support the appointment of women and minorities to the boards of other tech companies. Interviews with tech CEOs indicate that tech leaders can expand their influence by sharing with their peers and mentees the opportunity to advise smaller companies. Across all U.S. business sectors, the tech sector currently ranks lowest in the percentage of women serving on boards.⁸³ Working with promising women and underrepresented talent to respond to requests for board positions or mentorship at startups has the effect of prioritizing diversity and inclusion in new companies from their very inception.

iii. Invest in companies and contract suppliers led by women and people of color. Tech leaders can use their influence as investors or clients to lift up businesses that value diversity and take strong steps toward inclusion. Adding diversity of founders and management teams as a metric to the scorecard for guiding investment would help increase the amount of funding available to these businesses, dramatically improving the business case for tech company suppliers to improve their internal diversity.

⁸¹ Richman, Amy L., et al. "The relationship of perceived flexibility, supportive work-life policies, and use of formal flexible arrangements and occasional flexibility to employee engagement and expected retention," *Community, Work & Family*. Vol 11(2), 2008.

⁸² The effect sizes were small but significant, with work-life support policies explaining roughly 20% of the variation in these factors. Butts, Marcus, Wendy Casper, and Tae Seok Yang. "How Important Are Work-Family Support Policies? A Meta-Analytic Investigation of Their Effects on Employee Outcomes," *Journal of Applied Psychology*. Vol 98(1), 2013, 1-12.

⁸³ "Tech Companies Lag in Gender Diversity on Boards of Directors," *Equilar*. Nov 2015.

8. Tap into the work of partner organizations to prepare the workforce of the future.

The educational bottleneck for diverse talent appears to be centered on the high school and early college years—this is when underrepresented minorities tend to leave the path toward a college degree in a field relevant to a tech career. It may take five to ten years, then, to see the fruits of today's efforts to support computer science and engineering skills among underrepresented minorities. Over the long haul, however, investments in improving the pipeline are essential to sustaining greater workforce diversity.

Fortunately, tech companies can invest in a wide array of evidence-based approaches to pipeline improvement, ranging from education to infrastructure to mentorship. Too many of these programs have been designed and studied even to summarize here, but organizations such as Change the Equation's STEMWorks have reviewed and vetted a great number of investment-ready education initiatives for tech companies to choose from—STEMWorks recommends 77 of them at last count.

Call to Action, Toward a More Diverse Future

Today there are almost one million missing women in the US tech sector, and half a million missing African Americans, Hispanics, and Native Americans.

The untapped talent within these communities has the potential to drive technological change on a massive scale.

This is a crucible moment for the tech sector.

It is committed to change; and yet, the change it seeks has proved elusive. This report calls on tech companies to commit to a shared goal in order to focus their investment and improve their chances of near-term success with the crucial challenges of diversity and inclusion. It's time to rally around sustained coordinated action; the tech sector's goal should be to work with peers and colleagues to quickly usher the industry into a future that is diverse, inclusive, and representative of the pool of talent—and ultimately of the broader population.

This shared goal can be ambitious yet still achievable given marketplace constraints.

For these reasons, this report calls on tech companies to commit to a goal of “Five in Five”—that is, increasing representation of racial/ethnic minorities and women in technical and leadership roles by five-percentage-points in five years. Achieving this goal would bring the representation of racial/ethnic minorities at large tech companies close to their representation in the talent marketplace, and lift the representation of women employees closer to the same benchmark.

By committing to the “Five in Five” goal and investing in the actions described above, tech companies have the opportunity not only to make the sector more inclusive and equitable but also to drive bottom-line growth.

Over time, this approach could expand to other dimensions of diversity, such as gender identity, age, diverse abilities, veterans status or professional background, and extend the promise of a career in high tech to other historically excluded groups.

Data-driven problem solving, continuous learning, and bold targets are how tech companies tackle their greatest challenges; it's part of their DNA.

The challenge of diversity and inclusion should be no different. It's time to commit to a realistic but aggressive set of goals both by driving accountability from the top and learning and adapting approaches along the way. The tech industry has been driving Moore's law for the past fifty years, transforming the world in the process. A group of innovators, engineers, and creators that are capable of creating change at this scale are capable of solving the tech industry's diversity challenges. It's time to disrupt the industry once again through data, investment, and ingenuity.

CHAPTER 6. DIVERSITY IN THE GLOBAL CONTEXT

Tech companies are, of course, no longer bound by national borders.

Most leading U.S. tech companies sell to a broad pool of overseas customers, source their components internationally, and maintain a range of international offices. In other words, the challenges and opportunities of diversity for U.S. tech firms extend beyond the nation's borders. Examining diversity only in the U.S. risks overlooking critical workforce issues overseas, where roughly two-thirds of global tech spending originates and growth, in several large markets, is outpacing the United States.⁸⁴

There are many ways to define diversity in a global context.

Gender, race, ethnicity, and tribal affiliation all come into play. Yet what constitutes a racial, ethnic minority, and/or tribal minority varies wildly across national lines. “Global” also reflects a massive collection of countries, some of which are more interesting and useful to analyze for the purposes of this report than others.

This chapter uses a very specific working definition of diversity in the global context.

This analysis focuses exclusively on emerging markets outside of the U.S. and Western Europe, in order to examine how diversity challenges play out in different cultural contexts than those familiar to most readers of this report. Within these emerging markets, the analysis focuses on an issue of diversity common to all countries—gender—and sets country-specific questions of race and ethnicity to the side. Racial and ethnic diversity are usually highly specific to a given country or region. The relationships between majorities and underrepresented minorities in each country are extraordinarily complex, informed by long cultural and political histories. This deep complexity makes it impossible to analyze the effects of a “racially/ethnically diverse workforce” at a global level, or to speak about common approaches across countries.

Two critical questions emerge in this

discussion: first, what are the financial returns on gender diversity outside of the United States? And second, provided the returns are good, how can a US-based company encourage diversity in its global workforce?



In brief, the potential returns on diversity at a global level are tremendous.

Increasing global female representation in the tech workforce to levels proportionate to the general population could add between 0.5 – 0.6% to global GDP. While such gains may appear modest, this equates to an \$430-\$530Bn boost in global productivity, roughly equivalent to the entire economy of Norway or Taiwan.⁸⁶ The section aims to dive deeper into why these global returns matter to U.S.-based tech companies, the barriers to diversity in the global tech industry, and the specific set of actions U.S.-based companies can take.

Why Global Diversity Matters

When its customers and researchers are fully taken into account, **almost every tech company is a global company** and can benefit from the potential returns on increasing the diversity of the global tech industry.

U.S. companies with international operations require qualified technical staff worldwide, yet there is a serious and growing technical skills gap in most countries where companies have plants or offices.

Although there has been some debate as to whether or not the U.S.'s tech talent shortage is a "myth," job openings at leading tech companies speak for themselves.⁸⁷ As of March 2016, Amazon, for example, listed 16,252 open job positions worldwide; Google, 2,200; and Intel, 1,438. Across the globe, there are positions that need to be filled now. Yet, as with the United States, the development of technical talent is not keeping pace with these gaps in emerging markets either. To cite just one example, in India, 48 percent of companies say they struggle to recruit qualified engineers, IT staff, and technicians.⁸⁸ Bringing untapped, underrepresented groups into the tech workforce in these markets has the potential to bridge the labor supply gap in this growing sector.

And, as has been well-discussed elsewhere, regardless of where their offices are located, tech companies' customer bases are increasingly global—often, Asian—and diverse international employees and partners are essential to understanding this range of markets.

In 2014, more than half of the revenue (59 percent) of tech companies among the S&P 500 flowed from overseas sales. Yet these markets are extraordinarily complex. As pointed out by the founder of a startup in Southeast Asia: "Asia is home to 52 widely spoken languages...numerous cultures, religions, legal systems...and many more nuances..." Hiring and partnering with diverse top quality people is essential to understanding, and ultimately, succeeding in these markets.

Diversity Gap

The gender gap facing women in the tech workforce tends to vary globally at the entry-level and mid-level in tech careers, but is consistently poor at the senior levels.

22 percent of all roles in the Indian tech industry are filled by women, according to India's leading IT-BPM association, compared to 28 percent in the U.S. However, the Czech Republic, Estonia, and Bulgaria all reported over 50 percent of the people employed in high tech manufacturing in their countries were women. At the leadership levels, only 11 percent of chief information officers are women in Asia and Africa versus 18 percent in the United States.

⁸⁴ Forrester: Global Tech Market Outlook 2016-2017

⁸⁵ Based on an analysis of female representation in technology sectors across a sample of 26 countries across multiple continents. Dalberg analysis

⁸⁶ IMF World Outlook, UCTAD, WISAT, UNITE-IT, Dalberg analysis

⁸⁷ Charette, Robert N. "The STEM Crisis is a Myth," IEEE Spectrum, Aug 2013.

⁸⁸ "A new vision for growth: Key trends in human capital 2014," PwC. 2014.

⁸⁹ Clark, Don. "Strong Dollar Batters Earnings for U.S. Tech Firms," Wall Street Journal. Jan 2016.

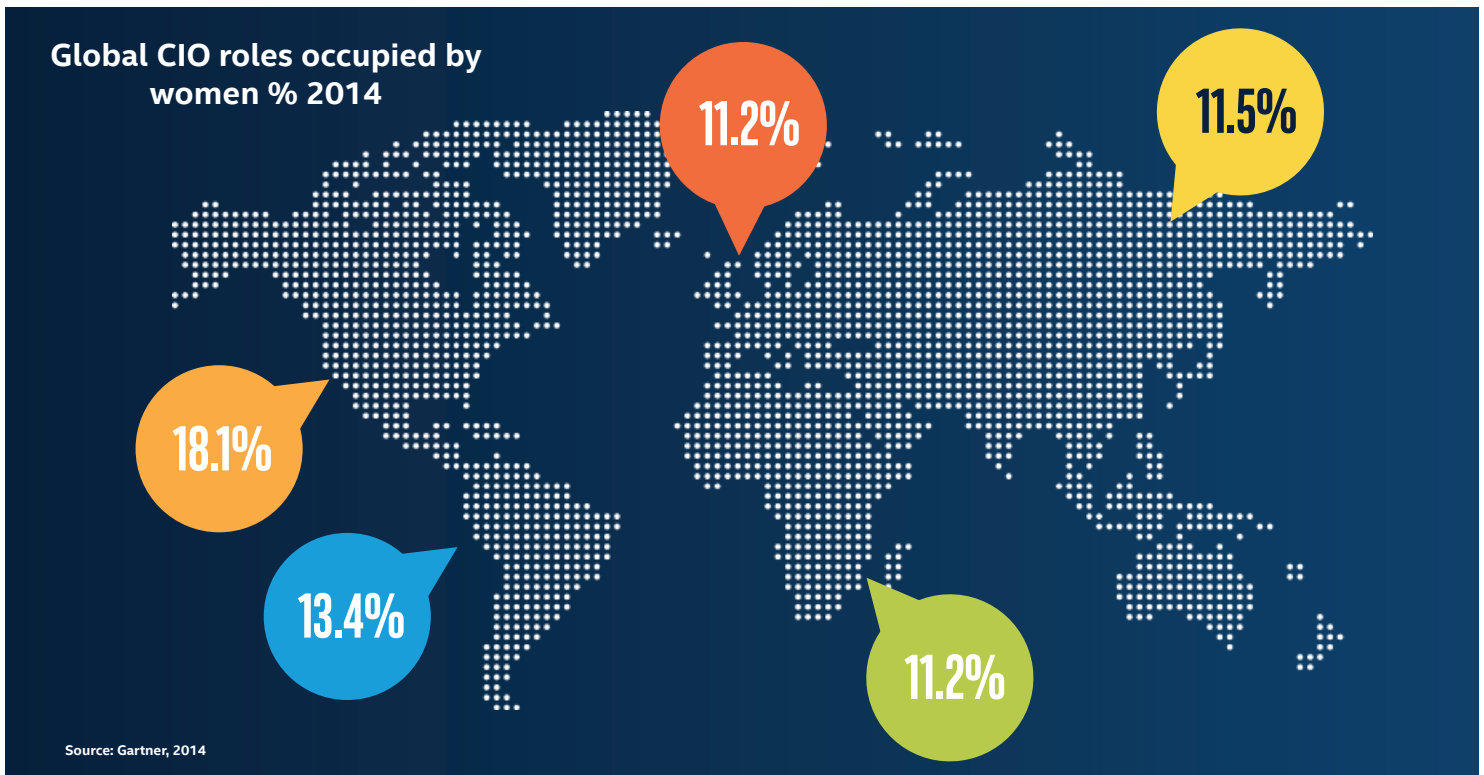
⁹⁰ Clayton, Thomas. "Ready to expand your startup into Asia? Read this," The Next Web. 2014.

⁹¹ "Diversity in action: NASSCOM Corporate Awards for Excellence in Diversity and Inclusion 2011," PwC. 2011.

⁹² Eurostat's High-Tech Statistics. Feb 2016.

⁹³ Emia, Vanna. "China's Tech Industry Opening Up Female Techies," Yibada. Jun 2015.

Exhibit: Percent of women in Chief Information Officer Roles by region



Barriers

Addressing global diversity in tech requires a nuanced understanding of how barriers manifest across the globe.

These sizeable, longstanding barriers often begin in the school system and proceed into the workforce, leading to lower numbers of women in computer science and engineering careers. According to CTI surveys, for example, between 60 – 70 percent of women across science, engineering, and technology fields in Brazil, China, and India experience regular sexual harassment (compared to 52 percent in the U.S.).^{94 95}

Women and girls in emerging markets who seek qualifications in technical skills face serious challenges that can be more difficult than those in the U.S.

A Pew survey that looked at global gender equality found that around 50 percent of respondents in Egypt and China believe that a university education is more important for a boy than a girl, compared to 15 percent in the United States.

One factor that also differs considerably from country to country is the degree of exposure women have to the Internet, as well as the familiarity with technology that comes with that exposure. Across emerging markets, women are on average roughly 50 percent less likely than men to be connected to the Internet. Intel and Dalberg's Women and the Web report found that one in five women in India and Egypt believe the Internet is not "appropriate" for them.⁹⁶ Such limitations on basic access, in turn, affect the likelihood of employment in the ICT sector down the line. It is worth noting, however, that there are notable exceptions – the gender gap between men and women in Mexico was only 10 percent, with 37 percent of Mexican women having used the Internet for over five years.⁹⁷

⁹⁴ Kärkkäinen, Outi. "Women and Work in Egypt: Tourism and ICT Sectors," ETF. October 2010.

⁹⁵ Collins, Terry. "Women in tech don't get the same respect as men, survey says," CNET. May 2015.

⁹⁶ "Women and the Web," Intel and Dalberg. 2012.

⁹⁷ Ibid.

Despite these considerable barriers, there is reason for hope.

A high percentage of women surveyed in notable tech hubs around the world note that they enjoy their work and are committed to advancing their careers in tech (see exhibit below). This passion and energy for technology can be cultivated and harnessed, and used to fuel growth and innovation across international tech companies' workforces. The next section describes what companies are doing to facilitate these women's aspirations to engage more fully, and in greater numbers, in the tech workforce.

Current Interventions

Many countries and organizations are taking important steps to improve workforce diversity, particularly among women.

It is impossible to highlight within the confines of this report the full range of activities currently underway around the world. However, a few examples offer a glimpse of these promising efforts to advance the cause of diversity in the workplace.

Andela case study

Andela was founded in 2014 to link talented people who lack access to high-tech careers with the countless companies that lack the resources to find, hire, and retain top software engineers. To address this problem, Andela built campuses in Lagos, Nigeria, and Nairobi, Kenya, and designed a four-year, post-graduate technical leadership program with leading global tech companies. The program covers necessary technical, business, and interpersonal skills and places students as full-time, distributed software engineers with top global tech companies, ranging from startups such as Udacity to industry leaders including IBM and Microsoft.

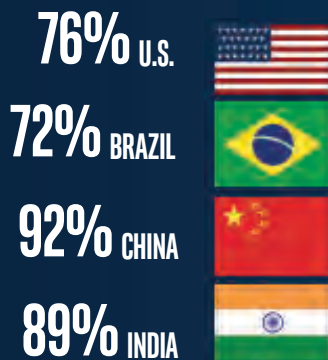
Since May 2014, over 30,000 people from 12 countries across sub-Saharan Africa have applied. Andela accepts the top 0.7% into its program. While some tech companies in the U.S. with 100 or more software engineers struggle to employ 10 – 15 percent women in technical positions, Andela currently reports 18 percent female engineers in its program—despite substantial cultural and resource barriers to women across the continent.

Exhibit: Perceptions by Women in Science, Engineering, and Technology

Despite the gender barriers, there is reason for hope

Percentage of Science, Engineering, Technology Women
Survey of global respondents

"WE ARE VERY AMBITIOUS"



"WE ARE VERY EAGER TO BE PROMOTED"



Exhibit: A sample of global tech diversity interventions

EDUCATION

WeTech Seed Funding for Women + Girls in Computer Science provided 35 grants to computer science training and empowerment organizations across six African countries in 2013. 77% of these organizations reported this funding resulted in a stronger network for girls and women in tech, and 35% reported increases in women pursuing CS degrees and/or securing work in tech.

RECRUITMENT

Tech Mahindra, an Indian IT and BPO firm, has instituted twice-annual “women only” recruiting drives in an effort to improve gender diversity within its company, eliminating possibilities of bias against women by restricting the applicant pool. It has set a target of 30% women in technical roles, and reports that it is making progress toward that goal.

RETENTION

Tech Women, an initiative sponsored by the State Department’s Bureau of Educational and Cultural Affairs, brings women leaders in tech from around the world to Silicon Valley, for networking and mentorship. Graduates of the program self-report increased self-confidence, attaining promotions in tech jobs more quickly, and increased involvement in entrepreneurial initiatives in their home countries.

ENTREPRENEURSHIP

SheLeadsAfrica is a community aimed at helping “young African women achieve their professional dreams,” and holds workshops across Sub Saharan Africa on tech entrepreneurship for young women. The organization has seen success - for example, it sent eight women-led tech startups to “Diaspora Demo Day,” the largest gathering of African startups and angel investors outside the continent.

Common diversity challenges tend to emerge across countries and subpopulations, as do common strategies for addressing them, yet solutions ultimately must be tailored to each country’s unique context.

India presents a helpful case study, illuminating how company leaders can best approach encouraging diversity throughout their global workforce.

Case study: Gender diversity in the Indian workforce

India’s tech sector is known worldwide for its size, pace of growth, and increasingly, its high levels of gender diversity in IT at the university and recruitment stages.

In 2015, the Indian tech industry reached \$150Bn in revenues and contributed 7.5% to GDP. Tech directly employs more than 3.5Mn Indians and indirectly over 10Mn; in the past year alone it generated approximately 230,000 new jobs.⁹⁸ Of university graduates, 38 percent of IT entry-level recruits were women (compared to 37 percent in the U.S.).⁹⁹ ¹⁰⁰

India: Isolating challenges

India’s talent pipeline is successful at attracting women at the university level, yet faces challenges retaining women at the mid-career stage.

In 2011, women received 42 percent of computer science and engineering undergraduate degrees (compared to just 12 percent of computer science degrees and 18 percent of engineering degrees in the U.S.); computer science is generally understood to be a “woman-friendly field” in the country.¹⁰¹ Despite this very promising start, the tech industry’s gender gap emerges over time as female retention falls. NASSCOM reports that women made up just seven percent of executive officer positions (compared to U.S.’s 22 – 23 percent)—a 90 percent drop from these same companies’ pipeline positions.¹⁰² Survey data from the Center for Talent Innovation shows that nearly 70 percent of women in India in these fields experience sexual harassment and 50 percent perceive bias in performance evaluation, compared to 50 percent and 35 percent in the United States, respectively.¹⁰³

India: Finding solutions

Many companies have risen to the challenge of low retention rates through multi-pronged, holistic approaches to retaining women.

On the one hand, companies are creating policies and support structures that respond to women's needs through extended maternity leave, flexible work schedules, child support, and sabbaticals during critical points in a child's life (e.g., college qualifying exams).^{104 105}

Companies are also creating processes aimed at overcoming unconscious biases that prevent women from taking on critical line roles or easily re-integrating post-maternity leave.

For example, well-intentioned bosses may select a male employee to travel over a female employee without checking first if she indeed needs to stay at home to care for her family. To counter this, some companies have begun asking their employees explicitly every quarter whether they are willing to travel, circumventing assumptions that a female's supervisor may make.¹⁰⁶

Spotlight: Wipro

Wipro, an information technology consulting company headquartered in Bangalore, has taken on a number of activities to increase representation of women in its company. New mothers are given an additional six months of maternity leave on top of the statutory three months. Near the end of maternity leave, Wipro's HR department reaches out to the employee to facilitate a smooth return. Women of Wipro's mentoring program, in which high-potential mid-management women are linked up with organizational leaders have seen higher rates of promotions (18 percent compared to five percent in the company overall).¹⁰⁷ Wipro is also part of a consortium of 10 – 12 companies that discusses progress on their initiatives and host a speaker series for women in tech.¹⁰⁸

Recommendations for Global Action

The same fundamental strategies used to promote diversity in the U.S. context can work globally, with country-specific adaptations.

Companies are pursuing core strategies all over the world that include activating the technology education pipeline for previously overlooked groups, reaching for diversity in the recruitment process, and developing programs that help retain diverse staff.

Examples are plentiful.

Within education, for instance, Google provides annual RISE awards to organizations that focus on computer science education throughout the world, with particular attention paid to girls and underrepresented minorities. As a recruitment strategy, Intel doubled its Employee Referral Program bonus globally for recommendations of female candidates in late 2015. To encourage retention, meanwhile, Cisco works with four other companies in Singapore to sponsor a monthly Mentoring Circle that brings together 8 – 10 mid-level women with a senior executive.¹⁰⁹ These examples are fairly young initiatives, but early anecdotal results demonstrate promise.

⁹⁸ India IT-BPM Overview, NASSCOM. 2014.

⁹⁹ "Diversity in action: NASSCOM Corporate Awards for Excellence in Diversity and Inclusion 2011," PwC. 2011.

¹⁰⁰ Breaking down the gender challenge," McKinsey. Mar 2016.

¹⁰¹ Varma, Roli, and Deepak Kapur. "Decoding Femininity in Computer Science in India," Communications of the ACM. Association for Computing Machinery, vol. 58(5), May 2015, 56-62.

¹⁰² "India Inc.: From Intention to Impact," Catalyst, 2015.

¹⁰³ Hewlett, "Athena Factor 2.0", 2014.

¹⁰⁴ Interview with Namita Vyas, Leader for Technology & Diversity Hiring, InMobi

¹⁰⁵ Interview w Samir Gadgil, Vice President & HR Head, Wipro

¹⁰⁶ Interview with Shachi Irde, Executive Director, Catalyst India

¹⁰⁷ "Making diversity work: Key trends and practices in the Indian IT-BPM industry," NASSCOM and PwC. Mar 2016.

¹⁰⁸ Ibid.

By leveraging the experience of local staff, data on gender gaps specific to the country, and investing in rigorous evaluations of interventions newly conceived or new to their particular context, tech companies can move the needle on global workforce diversity. For example:

INITIATIVE	SUGGESTED ADAPTATION FOR THE GLOBAL CONTEXT
Hold business managers accountable for diversity goals	Ensure diversity goals are designed in consultation with both local leadership and local diversity experts, resulting in a clear and country-specific business case
Build toolkits that attract women into the recruitment pool	Work with local managers to identify country-specific coded biased language that may lurk in job postings, and remain conscious that gender- and race/ethnicity-blind applicant tracking systems may not be feasible given the heavy use of networks in some countries to get a job.
Build on existing mentorship programs to formalize sponsorship programs for highly qualified underrepresented talent	Test this approach in a similar manner to how it is done in the United States; select evidence suggests that “exporting” mentorship programs works
Put affinity group promotion and expansion on the executive agenda.	Proceed with caution; global and local chapters of female affinity groups are helpful, but race and ethnicity-based affinity groups abroad risk provoking social tensions
Recognize meritocracy while establishing basic guidelines for interaction that counter unconscious bias	Many countries feature both conscious and unconscious bias, both experienced more intensely by women than in the United States; clear, direct, broadly-messaged guidelines for interaction are essential
Eliminate overt or subtle repercussions for staff taking advantage of flexible work programs, such as leave to care for a family member	Test this approach in a similar manner to how it is done in the United States, keeping in mind that the concept of “family” in many regions extends beyond the nuclear
Use influence to motivate action among partners	Look to assemble multi-country consortiums on diversity, drawing on U.S. tech companies’ unique role as industry leaders
Tap into the work of partner organizations	Rely even more heavily on partner organizations to provide deep local insight

Call to action

There are large disparities in the global tech sector, with women making up as little as 11 percent of the tech industry in some regions.¹¹⁰ Yet the financial returns on achieving a diverse global workforce are enormous, upwards of \$1.1Tn. Tech companies in the U.S. can help their global offices reach their own “Five in Five”—a five-percentage-point increase of women in five years—to realize some of these gains. The specific rallying cry and the actions that follow will, of course, need to be adjusted to specific country contexts and owned by local offices; a balance will have to be struck between inspiration and feasibility. But given the current push for diversity among U.S. tech companies, and given the reach of their global networks, now is the right time to push for a global movement—one that will strive to ensure that the tech industry reflects the true diversity of the world’s talent.

METHODOLOGY

Overview

The object of this report is to estimate the financial impact of increasing gender and race diversity in the tech industry. Dalberg’s analysis relied on diversity data for 167 tech companies that had published, released, or publically discussed their top-line diversity figures. These companies included large, influential tech companies (Alphabet, Apple, Facebook) and a wide range of smaller players in the industry. Data collected on these companies included female representation in executive teams and distribution of the staff by gender and race/ethnicity (African American, Asian, Hispanic, Native American, and other). Dalberg then performed linear regression analysis using firm-level data to understand the effects of gender and race diversity on the financial success of tech firms. The analysis looked at total revenues, market value, and operating margin as measures of financial success.

Dalberg tested the financial effects of three variables independently: i) female representation among staff, ii) female representation among executive team, and iii) racial/ethnic minority (non-White and non-Asian) representation among staff. (The data on racial/ethnic minority representation in the executive team were insufficient for analysis.)

This linear regression analysis yielded several statistically significant regression coefficients, indicating that changes in the independent variable (e.g., racial/ethnic minority representation) are associated with changes in the dependent variable (e.g., revenues). Dalberg applied these results to the 497 domestic technology companies listed on the NASDAQ to estimate the industry-wide effects on revenues, market value, and operating margin. The research team performed this analysis by multiplying the effect of increasing diversity sufficiently to close the existing gap in the industry (that is, the delta between current diversity and “representational diversity”) by 2014 industry revenues, market value, and operating margin, respectively. “Representational diversity” refers to the numbers cited on page 53 of Intel’s 2015 Diversity Report.



Financial and Diversity Data

Dalberg collected financial and diversity data from 167 US-based tech companies. These companies were selected because they had published, released, or publically discussed their top-line diversity figures. Sources for diversity data included EEO-1 forms (the U.S. Equal Employment Opportunity Commission's tool for gathering diversity data on the workforce of U.S. companies, using racial/ethnic definitions of the U.S. Census), company websites, annual reports, and press releases. Diversity variables included the following: number of female employees, number of females in executive team, number of racial minorities on executive teams, and distribution of employees by race/ethnicity: African American, Asian, Caucasian, Hispanic, Native American, and "other."

Sources for financial data included the Compustat database for public companies and PrivCo database for private companies. Financial variables included total revenue, earnings before interest and tax (EBIT), market value, net income, income taxes, and stockholders' equity.

Dataset Overview

The 167 tech firms in the database showed representation similar to that reported elsewhere: majority Caucasian and Asian males. Of the 2,759,986 employees at the 167 companies in the dataset, 68% were male and 32% were female. Caucasians made up 63% of the workforce, followed by 22% Asian and 15% all other racial/ethnic groups combined. Among executives, 90% were men and 10% were women.

In aggregate, the 167 firms had revenues of \$1,406 billion, with average revenue of \$8.4 billion per firm. The total market value was \$3,046 billion; average market value was \$34.6 billion and average operating margin was 19%.

The average employee count was 28,716, although this average was skewed upwards by several extraordinarily large companies; the median was 7,200. The highest ratio of females on staff was 52%; the lowest was 8.8%. The highest ratio of racial minorities was 27%; the lowest was 1%. 39% of the companies in the dataset had at least one woman on their executive team.

Firm Level Linear Regression and Industry-Wide Extrapolation

Dalberg performed firm-level linear regression analysis on the 167 companies and extrapolated the results to estimate industry wide effects. The research team measured "financial success" using three dependent variables: i) market value, ii) total revenue, and iii) operating margin; it measured "firm diversity" using three independent variables: i) share of female employees, ii) whether or not there was at least one female in the executive team, and iii) share of non-Asian minority employees (African American, Hispanic, Native America, and Other),¹¹¹

These analyses controlled for company employee count, age of the firm, total revenue (when the dependent variable was market value), net income (when the dependent variable was market value or operating margin), stockholders' equity (when the dependent variable was market value or operating margin), and market value (when the dependent variable was total revenue or operating margin).

In order to estimate industry effects, Dalberg first multiplied the firm-level results by the existing diversity gap, measured as the delta between current diversity and representational diversity. "Representational diversity" refers to the numbers cited on page 53 of Intel's 2015 Diversity Report that describe racial and ethnic minority representation in the tech talent pool. The next step was to multiply these figures by the sector-wide revenues, market value, and operating margin, respectively, in order to estimate the potential effects of increasing diversity at the industry level.

Findings and Validation Steps

Dalberg examined the results using $\alpha = .10$ as the bar for significance. The findings were as follows:

- Female representation among staff:
No statistically significant effects
- Female representation among executive team: Statistically significant effects on market value
- Racial minority representation among staff: Statistically significant effects on revenue and profitability

Dalberg also compared findings of statistical significance and effect sizes against those found in a range of peer-reviewed studies published in academic journals, and studies published by economics think tanks (e.g., *Academy of Management Journal*, *American Sociological Review*, *Center for Advanced Human Resource Studies @ Cornell*, *Human Resource Management*, *Group and Organization Management*, *Journal of Business Ethics*, and *Peterson Institute for International Economics*).



GDP impact estimation

The impact on GDP was estimated by translating the revenue gains associated with increases in tech sector racial/ethnic representation to an estimate of gains in sector-wide market valuations, using a constant price/sales ratio for US equities. These gains in market valuation were summed with the gains in market valuation associated with achieving representational gender diversity in tech company leadership. Dalberg then benchmarked the ratio of total market capitalization to national GDP for the past three years, and translated the increase in market valuation into an estimated GDP increase using this benchmarked number. These gains were then calibrated by the proportion of US GDP that the technology sector represents. This analysis is intended as an initial estimate, and not the final word on national productivity gains associated with increasing diversity in tech. One particularly promising pathway for further research would be a general equilibrium analysis of how movement of women and racial/ethnic minorities out of other economic sectors into tech impacts aggregate national labor productivity. The analysis featured in this report does not account for the changes in national productivity that might result from a loss of diversity in other sectors, nor does it account for the inherent gains of shifting individuals from working in lower-productivity sectors into the high-productivity technology sector. As noted earlier, this analysis is intended to break new ground in estimating the economic effects of tech workforce diversity, and invites other researchers to build upon these findings and invest in further analysis that expands our understanding of these complex dynamics.

¹⁰⁹ For more information on Google RISE Awards, go to: www.google.com/edu/resources/programs/google-rise-awards/

¹¹⁰ Gartner data

¹¹¹ Building the Business Case for Diversity & Inclusion: Stories from Asia," Diversity & Inclusion In Asian Network and Community Business. Mar 2016.

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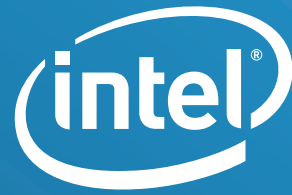
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