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ASSESSING COMPANIES OBJECTIVELY: A FRAMEWORK FOR ESG INTEGRATION IN TECHNOLOGY MERGERS AND ACQUISITIONS DEALS

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Abstract : This work project investigates how an Environmental, Social, and Governance (ESG) framework can be integrated into the due diligence process for technology mergers and acquisitions (M&A) to achieve a clearer and more objective view of target companies. The focus is on using tools like Impact-Weighted Accounts (IWAs) and Sustainable Weighted Average Cost of Capital (SWACC) to embed ESG factors directly into valuation processes, enabling a more precise understanding of a company's overall impact and financial potential.

Keywords : Merger & Acquisition, Technology Deals, Sustainability, ESG Criteria, Corporate Valuation

Introduction

Before starting this work project, I met and called many professionals from the M&A industry to better understand why ESG criteria had not yet been widely incorporated into M&A transactions. The answers were unanimous, so far, the lack of awareness on how to assess more objectively companies' impact and the quest for high valuation and therefore high fees was surpassing any wish to become greener and risking lowering the deal value.

Motivated by this insight, I set out to explore why and how investment bankers could become more aware of the importance of integrating ESG criteria into their due diligence processes. To ground my research in practical experience, I joined Carlsquare in their London office for an internship of five months as an M&A Off Cycle Analyst. This leading German investment banks operating mostly on technology deals for small and mid-cap companies taught me how M&A deals are done and showed me on what lever my idea of a framework would be the most impactful.

From my perspective, incorporating ESG criteria into M&A is no longer optional. Investors and corporations increasingly recognize that these factors significantly influence financial performance, competitive advantage, and reputational value.

This work project aims to address this need by proposing a structured framework that integrates ESG considerations into the valuation and due diligence processes for technology M&A transactions. Moving beyond qualitative assessments, the framework utilizes quantitative tools such as Impact-Weighted Accounts (IWAs) and Sustainable Weighted Average Cost of Capital (SWACC) to deliver a more precise and comprehensive evaluation of companies. By embedding these metrics into the M&A process, the proposed framework provides an objective assessment of target companies, offering deeper insights into how ESG factors influence both short and long-term value. Ultimately, the objective of this research was to develop a methodology for determining the optimal price for a company.

Chapter 1: Understanding Mergers and Acquisitions (M&A)

1.1 Unique Characteristics of Technology Sector M&A Deals and ESG implications

M&A in the technology sector, historically seen as potentially disruptive to agility and innovation, is increasingly regarded as essential in the highly competitive and rapidly evolving tech landscape. Previously, M&A was perceived as counterproductive due to concerns about its effects on innovation, talent retention, and intellectual property protection. However, with technology now contributing for approximately 1.5% to 4% of global emissions (World Bank, 2024), with projections suggesting an increase to 15% by 2040 (Belkhir & Elmeligi, 2018) and with the proliferation of devices and cloud-based services that has resulted in the expansion of data centers, which currently consume 2% of the world's electricity and could rise to 8% by 2030 (Harvard Business School, 2023) this M&A activity is crucial for accessing new technologies, intellectual property, and skilled talent pools necessary for driving both competitive advantage and sustainable practices.

In Europe, the technology sector leads in M&A activity, where deal volumes, according to MergerMarket, rose from 920 in 2016 to 3,562 in 2022, and deal values nearly doubled from €70.15 billion to €143.64 billion. A robust M&A strategy now complements the growing emphasis on ESG, particularly in environmental responsibility, as tech companies face pressures to mitigate emissions and adhere to sustainable practices.

While M&A once raised concerns about innovation, culture, and intellectual property, today’s tech market calls for a new perspective. M&A now plays a crucial role in accessing technology, talent, and intellectual property while fostering innovation and aligning with ESG goals. A balanced approach, integrating frequent acquisitions with in-house development, sustains growth, enhances competitiveness, and addresses global emissions, ensuring long-term resilience and sustainability in the tech sector.

Chapter 2: Importance of ESG in Business Decision-Making

2.1 ESG Considerations in the Technology Sector

The technology industry plays a crucial role in addressing ESG challenges by developing tools for sustainability management and promoting energy-efficient practices. Companies like Google aim to achieve 24/7 carbon-free energy for data centers by 2030, leveraging AI for energy optimization and investing in advanced storage systems. Similarly, OPPO's innovations, such as the Zero-Power Tag and Battery Health Engine, reduce energy consumption and extend battery life, showcasing the potential for sustainable technology.

Embedding ESG principles across supply chains is essential to achieve carbon neutrality and foster innovation. Efforts include decarbonizing manufacturing, reducing product footprints, and promoting industry standards for climate action. Incremental changes throughout the product lifecycle can create significant sustainability impacts.

On the social front, data privacy has emerged as a priority, with companies like Salesforce incorporating Privacy by Design into their products. The widespread adoption of cloud computing has also enhanced social inclusion by providing essential services to underserved communities, especially during the pandemic. Post-pandemic, cloud solutions continue to enable equitable access to education, healthcare, and employment opportunities.

Effective governance underpins risk management and resilience. Microsoft's Digital Safety initiatives and the adoption of collaborative DevOps practices illustrate how governance frameworks foster transparency and innovation. Integrating diverse stakeholders into DevOps enhances collaboration and governance structures.

Technology companies must prioritize societal impact by supporting sustainable innovations and helping startups adopt ESG principles. Collaboration across the tech ecosystem can bridge the global technology divide and amplify progress toward sustainability.

2.2 Regulatory and Market Drivers for ESG in M&A

The evolving regulatory landscape in the European Union (EU) is exerting substantial pressure on companies to integrate ESG considerations into their operations and M&A strategies.

The Corporate Sustainability Reporting Directive (CSRD), implemented in January 2023, significantly enhances the breadth of ESG reporting requirements. Building upon the Non-Financial Reporting Directive (NFRD), the CSRD mandates that approximately 50,000 large, medium, and small-sized companies across the EU, as well as international companies with significant EU operations, comply with enhanced reporting standards. These standards adopt a double materiality approach, mandating disclosures on both the impact of climate change on the company and the company's impact on society and the environment. The CSRD also introduces stringent rules for reporting Scope 3 emissions, compelling companies to gather and report sustainability data across their entire supply chain. This comprehensive approach necessitates significant investments in technology and processes to ensure accurate data collection and third-party verification.

On May 24, 2024, the European Council and European Parliament formally adopted the EU Corporate Sustainability Due Diligence Directive (CSDDD). This directive places obligations on large companies to address the adverse impacts of their activities on human rights and environmental protection, while also defining the associated liabilities. The rules extend beyond a company's direct operations to include the activities of its subsidiaries and business partners across the entire value chain. The CSDDD aims to strengthen human rights and environmental protection by requiring covered companies to identify, prevent, mitigate, and address adverse impacts linked to their operations.

The CSDDD applies to EU companies with more than 1,000 employees on average and a net worldwide turnover exceeding EUR 450 million, as well as to ultimate parent companies of groups meeting these criteria. Non-EU companies are also covered if they have generated a net turnover in the EU exceeding EUR 450 million or meet other specified financial thresholds. SMEs are not directly in scope but may be affected as contractors or subcontractors to larger companies. The timeline for adoption spans from 2024 to 2029, with phased compliance requirements based on company size and turnover.

ESG considerations are now pivotal in M&A activities, with regulations like CSDDD and CSRD demanding thorough due diligence and reporting. Non-compliance risks legal and reputational damage, urging companies to adopt robust ESG frameworks in M&A strategies. This approach mitigates risks, ensures compliance, and fosters sustainable value creation aligned with societal expectations and regulations.

Furthermore, these regulatory initiatives are now supported by independent efforts from stakeholders committed to developing world-class ESG tools :

Social Return on Investment (SROI)

The concept of SROI has its roots in the broader movement of social accounting and impact measurement that gained momentum in the late 20th century. SROI evolved as a response to the growing need for organizations, especially in the nonprofit and social enterprise sectors, to measure and articulate the value of their social, environmental, and economic impacts in a systematic and quantifiable manner.

SROI was initially developed in the United States in the late 1990s by the Roberts Enterprise Development Fund (REDF), a philanthropic organization based in San Francisco. REDF sought to create a more robust framework for measuring the social value created by its investments in social enterprises, beyond traditional financial metrics.

The development of SROI was influenced by the emergence of triple bottom line accounting, which emphasizes the simultaneous consideration of financial, social, and environmental performance. In the early 2000s, SROI began to gain traction in the UK and Europe, where it was further refined and standardized. The SROI Network (now known as Social Value

International), established in 2006, played a crucial role in promoting and developing SROI methodology, providing training, resources, and accreditation for practitioners.

Today, SROI is recognized as a comprehensive framework that guides organizations in identifying their stakeholders, understanding and measuring the outcomes of their activities, and valuing these outcomes to provide a fuller picture of their impact. It has been widely adopted by nonprofits, social enterprises, and even some for-profit companies committed to social responsibility, helping them to improve their impact management and reporting.

Global Impact Investing Rating System (GIIRS)

The GIIRS, was developed to address the need for standardized, transparent, and credible assessments of the social and environmental performance of companies and investment funds. The concept of GIIRS was conceived in the late 2000s, as impact investing gained traction as a strategy for allocating capital to generate not only financial returns but also positive social and environmental impacts.

GIIRS was officially launched in 2011 by B Lab, a nonprofit organization that also manages the certification of B Corporations. The development of GIIRS was supported by a coalition of leading impact investors, including the Rockefeller Foundation, the Prudential Foundation, and Deloitte, among others. These early supporters saw the potential of GIIRS to offer the impact investing market a tool similar to Morningstar's investment rankings and Capital IQ's financial analytics, but with a focus on social and environmental performance.

GIIRS was designed to provide a comprehensive and transparent system for rating and analyzing the impact of companies and funds. It evaluates organizations against a set of rigorous social and environmental performance standards, drawing on data collected through the B Impact Assessment, which assesses companies' impact on their workers, communities, customers, and the environment. GIIRS ratings are used by impact investors to compare and verify the social and environmental performance of potential investments, facilitating more informed decision-making and helping to unlock sidelined investment capital.

Since its launch, GIIRS has built the largest database of social and environmental performance data for private companies and funds, making it an invaluable resource for the impact investing community. By providing standardized metrics and analytics, GIIRS has helped to increase transparency, comparability, and accountability in the impact investing market, driving the growth and development of the industry.

Sustainability Accounting Standards Board (SASB)

The Sustainability Accounting Standards Board (SASB), established in 2011 as a nonprofit organization, was created to assist businesses and investors in developing a shared language for understanding the financial impacts of sustainability, amid a growingly complex landscape of corporate sustainability disclosures.

In response to calls for simplification, SASB merged with the International Integrated Reporting Council (IIRC) in June 2021 to create the Value Reporting Foundation. This new entity provided tools such as the Integrated Thinking Principles, the Integrated Reporting Framework, and the SASB Standards. This merger signaled significant progress towards streamlining sustainability reporting. In November 2021, the IFRS Foundation announced the creation of the International Sustainability Standards Board (ISSB) and plans to consolidate the Value Reporting Foundation and the Carbon Disclosure Standards Board (CDSB), finalized on August 1, 2022.

The ISSB now oversees the SASB Standards, maintaining, enhancing, and evolving them to meet investor needs and support IFRS Sustainability Disclosure Standards. SASB Standards, designed to address industry-specific sustainability issues impacting financial performance across 77 industries, are available for free download for non-commercial use, with licensing for commercial purposes. These standards help companies deliver important sustainability information to global capital markets in a clear and actionable manner.

Impact-weighted accounts (IWAs)

Developed by Harvard Business School under the supervision of Professor George Serafeim and supported by the Global Steering Group on Impact Investment (GSG) et l'Impact Management Project (IMP), IWAs are financial statement line items that enhance the evaluation of a company's overall performance by incorporating not only traditional financial outcomes but also the company's positive and negative impacts on employees, customers, the environment, and society. These accounts translate diverse social and environmental impacts into standardized units that are easily understood by business managers and investors. By combining financial and impact performance in a single set of accounts, IWAs facilitate meaningful aggregation and comparison of these impacts without sacrificing essential details. This integration allows for the application of traditional financial and business analysis tools to assess corporate performance in a comprehensive manner. The IWAs lead to the creation in 2022 of the International Foundation for Valuing Impact (IFVI) an independent nonprofit bridging the gap between financial accounting and impact measurement

However, measuring a firm's value to all stakeholders in monetary terms is complex, requiring the evaluation of value-creating versus value-destroying activities, as well as the broader societal impact of products. While initial measures might include straightforward metrics like employee wages or community spending, questions arise about their accuracy, such as whether training costs truly reflect value creation. The challenge lies in converting diverse value indicators into a common unit like dollars. In overall, advances in understanding social costs, such as the social cost of carbon, and improvements in monitoring technology make this comprehensive assessment increasingly feasible.

To answer this challenge and dollarize value indicators, IWAI actors propose a structured three-step measurement model.

The first step, Motivation, involves defining the company's motivations as articulated through its purpose, mission, vision, and core values. This stage ensures that the organization's guiding principles and goals are clearly established, providing a foundation for the subsequent measurements.

In the second step, Measurement, specific metrics are identified to assess progress in achieving these motivations. This measurement phase is divided into four main domains:

- Inputs, representing the human, social, natural, physical, and financial resources utilized in the company's operations.
- Outputs, which measure what the company produces as a result of its activities.
- Outcomes, which capture the changes that the company's activities bring about.
- Impacts, which refer to the broader effects on the well-being of various stakeholders, like customers, employees, suppliers, society, and the environment.

The third step, Monetization, involves translating the parameters defined in the measurement phase into monetary terms. For this purpose, IWAI actors have developed impact calculation models that are based on established guiding principles. These models help convert different impact sources into monetary units, providing structured frameworks and examples. They emphasize three key dimensions of impact relevant to businesses: the impact on employment, the impact of marketed products, and environmental impact.

Also, the IWAs introduce an innovative approach to structuring the Profit & Loss statement, known as the Integrated Profit & Loss (IP&L). It broadens traditional financial accounting to provide a holistic view of an organization's social, environmental, and economic impacts@. Through the IP&L, the impacts across various stakeholder groups—including shareholders, employees, suppliers, customers, and the broader society—are quantified, monetized, and consolidated into a single report, enhancing comparability and transparency.

This approach allows organizations to make informed decisions by evaluating trade-offs between different impacts, such as prioritizing biodiversity conservation over climate change mitigation. By examining changes across six key capitals - financial (taxes, profits, wages), manufactured (produced products, fixed assets), intellectual (intellectual property, technology development), social (social cohesion, contribution to human rights, child labour, underpayment), human (wellbeing of employees and clients, safety of employees and clients), and natural (contribution to climate change, biodiversity, and soil, water and air pollution) - the IP&L offers a holistic view of both value creation and depletion. Through advances in understanding social costs, like the social cost of carbon, and the improvement of monitoring technologies, organizations can use IP&L to report performance beyond mere profit, capturing a fuller picture of their effects on society and the environment.

In the end, the adoption of Impact-Weighted Accounts (IWAs) provides corporate managers with enhanced, monetized insights into the broader costs and benefits of their decisions, enabling them to align short-term pressures with long-term value creation. By translating environmental, social, and product-related impacts into financial terms, IWAs support a comprehensive assessment of strategic options, potentially attracting ESG-conscious investors and strengthening incentives for companies to improve their societal contributions. Additionally, regulators could leverage this data to create impact-based incentives, such as tax benefits tied to performance thresholds. Integrating IWAs into ESG frameworks thus shifts impact assessment into the core of business valuation and decision-making, allowing stakeholders a clearer view of a company's broader impact on society and the environment.

Chapter 3: Developing and Implementing the ESG Integration Framework for Technology M&A

3.1 Framework Overview and Objectives

Incorporating climate change considerations into a company's strategic decision-making is increasingly vital, as it directly influences financial stability and shareholder value.

Decisions related to operations, investments, and financing each intersect with climate change impacts, affecting cash flows, discount rates, and debt structures in ways that can fundamentally alter a company's valuation. Anticipating shifts in climate-related factors such as pricing, demand, and regulatory requirements enables companies to adapt production and distribution, secure a competitive advantage, increase brand value, brand power, outperforming against peers and ultimately stabilize or increase cash flows from operations. Plus, companies with high ESG ratings tends to have a lower cost of capital. (Dhaliwal et al., 2011*)*

Additionally, investments in resilient infrastructure or sustainable technologies can reduce a company's exposure to climate-related risks, thereby attracting investors, reducing share volatility and lowering the discount rate—a key metric that increases the present value of future cash flows. (Friede et al., 2015)

On the financing side, climate-conscious strategies can improve access to favorable lending terms, reducing overall costs of financing and enhancing availability of financing and leverage. Overall, addressing the impact of climate change across the company's decisions range (operating, investing and financing wise) can help increase long-term shareholder value.

This framework abidance with these strategic imperatives is designed to embed ESG considerations into all stages of the M&A process, ensuring alignment with evolving regulatory standards and market expectations. This framework is essential for companies operating in the EU and beyond, as ESG compliance and performance are increasingly influencing M&A transactions, impacting deal valuations, risk assessments and post-merger integration.

The first objective of this framework is to guide acquirers and investors in integrating ESG criteria into their M&A strategies, thereby improving risk management, regulatory compliance and potentially long-term value creation. The framework draws on recent regulatory developments, including the CSRD and the CSDDD, as well as globally recognized ESG measurement tools such as SROI, GIIRS, SASB and IWAs. Together, these tools and regulatory requirements provide a robust basis for assessing, managing and reporting on ESG performance in M&A activities.

The second objective is to offer sellers and acquirers new optimal valuation approaches coming from extensive institutional research, enabling them to identify specific ESG criteria that can be quantified and monetized and incorporate these ESG factors within valuation models, thereby capturing a holistic view of a company's ESG impact while providing data backed up by experts and institutionally validated data.

By integrating both strategic guidance and new valuation methodologies, the framework provides a comprehensive approach to embedding ESG into M&A, addressing both compliance needs and broader market expectations.

3.2 Identifying ESG Criteria for Technology M&A

In assessing ESG criteria for technology M&A, it is essential to consider how ESG factors affect not only the immediate operations and financial performance of technology firms but also their broader societal impact. An effective ESG evaluation depends on applying key qualitative characteristics of impact information—such as relevance, faithful representation, comparability, verifiability, and understandability—to ensure a comprehensive, unbiased, and accurate depiction of ESG risks and opportunities. Relevance is particularly crucial, assessed by examining the significance of each ESG impact on affected stakeholders and its influence on decision-making. For instance, environmental concerns like data center energy consumption impact both stakeholders and broader climate objectives, demanding inclusion in M&A considerations due to their potential regulatory and reputational implications.

Faithful representation is equally essential, ensuring that ESG information offers a truthful depiction of a company's ESG impacts. This requires that data is complete, neutral, and free from error. For instance, while positive impacts like reduced emissions may be highlighted, they should not obscure negative impacts such as data center energy use.

Verifiability provides confidence that ESG data can be corroborated by independent experts and cross-checked with external standards, making it reliable for M&A decision-making. This is particularly critical in the technology sector, where metrics related to carbon emissions, data privacy, and supply chain practices must be substantiated to support accurate valuation and risk assessments.

Understandability ensures that ESG information is clear, concise, and accessible to all stakeholders, including those without a technical background. This quality is essential in the technology sector, where complex ESG topics—such as cybersecurity protocols or regulatory compliance in AI—must be communicated in a way that avoids misinterpretation. Clear, comprehensible information supports accurate valuations and risk management by making ESG data more usable.

Major ESG criteria in the technology sector cover various aspects: environmental impacts such as the carbon footprint of data centers, electronic waste management, and sustainable sourcing practices; social factors like data privacy, cybersecurity, and labor rights in global supply chains; and governance elements involving regulatory compliance, responsible AI usage, and transparency in content moderation.

By incorporating this methodology for identifying the appropriate criteria into the proposed framework and valuation models, M&A actors can accurately quantify the financial implications and integrate them into a valuation model by converting these criteria into dollarized line items.

3.3 ESG Due Diligence Process

The ESG due diligence process is a thorough examination of ESG risks and opportunities that could significantly affect the company's resilience, long-term strategy, and valuation. Indeed, 62% of US investors are willing to pay a premium for target companies that align with their ESG priorities. (KPMG, 2023)

This process begins by identifying key business drivers and then evaluating climate-related risks and opportunities through multiple sources, combining both internal and external perspectives.

Discussions with company management are a critical component, as they provide direct insights into day-to-day operations and highlight specific ESG factors that could impact financial performance. Management's insights help prioritize risks and focus on areas of strategic importance. This is further supported by corporate sustainability reports and sector-specific disclosures, which help assess the company's ESG profile in relation to industry peers and offer management's view on material ESG issues.

Furthermore, the ESG due diligence process must assess companies' inputs to cover the full spectrum of resources the company utilizes—human, social, natural, physical, and financial. Human resources, community relationships, natural dependencies, operational infrastructure, and financial capital are all considered to understand how effectively the company leverages these resources to address ESG risks and opportunities. These inputs form the basis of the analysis, helping to establish how the company operates in alignment with sustainable practices. Outputs represent the direct results of the company's activities, such as the products, services, and efficiencies achieved through operations. By measuring outputs, the due diligence process assesses the company's immediate contributions to its stakeholders and its alignment with ESG objectives. This analysis may include quantifiable metrics, like carbon emissions reductions, resource efficiencies, and improvements in workplace diversity, which indicate the company's commitment to ESG goals.

In the next stage, outcomes are evaluated to capture the changes resulting from the company's actions. Outcomes encompass shifts in financial performance, operational resilience, workforce well-being, and the broader benefits to society. For example, an initiative to lower greenhouse gas emissions might not only lead to regulatory compliance but also enhance reputation and stakeholder trust, benefiting the company's competitive position and risk profile.

External data sources add valuable context to the due diligence process. Third-party ESG data providers, for instance, often utilize industry benchmarks to gauge the company's standing relative to public peers, while independent assessments from equity analysts and credit rating agencies incorporate ESG factors that influence market perceptions and creditworthiness. Asset-level and geospatial data provide detailed insights into physical risks, such as exposure to extreme weather events, enhancing the precision of the analysis. Geospatial data, specifically, enables a clearer view of location-based risks tied to climate events, facilitating a more accurate assessment of risks and the need for potential mitigation strategies.

Integrating inputs, outputs, and outcomes into the ESG due diligence process enables a comprehensive and balanced ESG analysis. This multi-dimensional approach ensures that ESG considerations are not only identified but also aligned with the company's key value drivers and strategic objectives. As a result, the due diligence process supports informed decision-making, integrating ESG factors into financial evaluations and promoting a sustainable approach to long-term value creation, whether in a buy-side or sell-side context.

3.4 Incorporating ESG in Valuation

Through my research, I found that the IWAs Initiative and the Sustainable Weighted Average Cost of Capital (SWACC) are today powerful tools for incorporating ESG factors into company valuations, allowing for a more accurate reflection of a company's sustainability efforts and the associated financial impacts.

The IWAs Initiative focuses on monetizing ESG impacts across three key dimensions: employment, product, and environmental effects. Rooted on the extensive work of the IFVI and its different methodologies and databases such as as the IFVI Global Value Factors Database, IWAs translate qualitative ESG criteria into financial terms. This process enables companies to quantify their positive and negative ESG impacts and incorporate them directly into their financial statements. In 2018, using the IWAs methodology, Intel's Total Employment Impact was assessed at USD 3.858 billion (Freiberg, Panella, Serafeim, Zochowski, 2020), showcasing the company's contributions through fair compensation, job creation, diversity, and employee development. This valuation was derived by analyzing two primary impacts and six sub-impacts. The Employee Impact, which includes monetization of Wage Quality, Career Advancement, Opportunity (employment opportunities across the firm), and Health and Well-being, accounted for a subtotal of USD 5.776 billion. Conversely, the Labor Community Impact, encompassing monetization of Diversity and the company's Location, resulted in a subtotal of USD (1.917) billion as shown in Figure 1.

Figure 1: Intel Employment Impact 2018

Dimension	Impact		% Revenue	% EBITDA	% Salaries
Employee Impact					
Wage Quality	$	6,503,438,571	45.47%	98.97%	88.92%
Career Advancement	$	(48,980,821)	-0.34%	-0.75%	-0.67%
Opportunity	$	(415,218,670)	-2.90%	-6.32%	-5.68%
Health and Wellbeing	$	(263,223,199)	-1.84%	-4.01%	-3.60%
Subtotal	**$**	**5,776,015,881**	**40.38%**	**87.90%**	**78.98%**
Labor Community Impact					
Diversity	$	(2,319,192,138)	-16.21%	-35.29%	-31.71%
Location	$	401,391,204	2.81%	6.11%	5.49%
Subtotal	**$**	**(1,917,800,935)**	**-13.41%**	**-29.19%**	**-26.22%**
Total Impact	**$**	**3,858,214,947**	**26.97%**	**58.71%**	**52.76%**

To provide greater clarity and a concrete example on how these figures are calculated, it is essential to delve into the methodology used for monetizing Wage Quality. This component captures the value of compensation in relation to industry standards and reflects its importance in evaluating employment impacts.

The following steps describe the wage quality monetization process and will be used to calculate Intel's Wage Quality.

A1) Determine the total unadjusted salaries paid by the firm:

*Total unadjusted salaries paid = Sum of (Number of employees in each salary band *Average salary in band)*

A2) Determine the appropriate annualized living wage for employee location j. We use a conservative estimate from the MIT Living Wage Calculator assuming 2 working adults and 2 children in each household.

*Annualized Living Wage = Hourly Living Wage * 2080 working hours*

A3) Determine the total wages paid below living wage:

*Wages paid below living wage = Number of employees earning less than local living wage * Actual salaries paid*

A4) Calculate the living wage adjusted salaries paid by subtracting the total amount of wages paid by the firm that are below the annualized living wage (3) and subtract from total wages paid (1).

Livable wage adjusted salaries paid = Total wages paid (A1) – Wages paid below living wage (A3)

A5) Determine a continuous function that describes the decreasing marginal impact of income (see Appendix 2)

A6) Pass all wages through the marginal impact of income function

A7) Sum all resulting values to produce the utility adjusted net wages

A8) Identify the number of employees in each race and ethnic group disaggregated by gender (hereafter referred to simply as "group") in occupation category l

A9) Determine the average salary for employees for each group in occupation category l

Average salary for group = Total salaries paid to group j / Number of employees in group j

A10) For each occupation category l, calculate the difference between the average salary paid to White male employees and minority group j employees, and multiply the resulting value by (8) to determine the per-group wage gap:

*Per-group wage gap = (Average salary paid to White males in occupation category l – Average salary paid to group j in occupation category l) * Number of employees in group j in occupation category l*

A11) Determine the total wage equity impact:

Total wage equity impact = Sum of per-group wage gaps (A10)

A12) Determine the equity adjusted salaries:

Equity adjusted salaries = Utility-adjusted wages paid (A7) – Wage equity impact (A11)

A13) Determine total wage quality impact:

Wage quality impact = Unadjusted salaries (A1) – Salaries below living wage (A3) – Marginal Utility Adjustment (A7) – Wage Equity Impact (A11)

Intel's 2018 wage quality impact calculation provides a detailed framework to evaluate fair compensation, workforce equity, and adherence to living wage standards. This methodology involves multiple steps, including assessing total unadjusted salaries, adjusting for living wage benchmarks, incorporating the diminishing marginal utility of income, and accounting for wage equity gaps. The final result demonstrates Intel's commitment to responsible compensation practices while identifying areas for improvement.

The process begins with calculating the total unadjusted salaries, based on data from Intel's EEO-1 Component 2 Report (Appendix 1) Using the number of employees in each salary band and the midpoint of those bands, Intel estimated total wages. For instance, if a salary band has 1,000 employees earning between $50,000 and $60,000, the midpoint of $55,000 is multiplied by 1,000, yielding $55 million for that band. Summing such calculations across all bands resulted in an estimated $7.31 billion in total as shown in Figure 2 topline.

Figure 2: Intel's Wage Quality Impact calculations

Wage Quality Impact	
Total Unadjusted Salaries	$7,313,439,500
Salaries Below Living Wage	($43,190,560)
Living Wage Adjusted Salaries	$7,270,248,940
Marginal Utility Adjustment	($301,322,044)
Utility-adjusted Salaries	$6,968,926,896
Equity disparity	($465,488,325)
Equity-adjusted Salaries	$6,503,438,571
Wage Quality Impact	**$6,503,438,571**

Next, the analysis benchmarks salaries against a living wage, calculated using the MIT Living Wage Calculator. A weighted average living wage of $38,345 is calculated for Intel, reflecting the geographic distribution of its employees. Salaries below this threshold amount to $43.19 million and are deducted from the total unadjusted salaries, resulting in living wage-adjusted salaries of $7.27 billion as presented in Figure 2.

A further refinement involves incorporating the marginal utility of income, a principle that emphasizes diminishing returns in the social impact of higher wages (Layard et al., 2008; Jebb et al., 2018; Diener et al., 1993). This approach utilizes a negative exponential functional form to adjust raw salaries, ensuring that lower wages contribute more significantly to the total impact while higher salaries are scaled down. For example, a $100,000 salary might be adjusted to $80,000, while a $50,000 salary retains its full value.

The adjustments are guided by two foundational principles. First, the functional form ensures that the marginal rate of salary impact follows a negative exponential curve. This design reflects the accelerating reduction in marginal utility as income increases. Higher wages above an identified inflection point experience decreasing marginal returns. The marginal rate begins to drop at $120,000, reaching approximately $182,000 before falling below 0.70. Beyond $194,000, the marginal rate is fixed at 0.05, indicating minimal incremental impact for additional income above this threshold. (Appendix 2)

Second, the inflection point is contextualized based on both income satiation research and local economic conditions. (Jebb et al. 2018) identify the income satiation level for life evaluation in

North America as $105,000. Adjustments for geographical differences, using the MIT Living Wage Calculator, increase this value by 16%, resulting in a contextualized inflection point of $122,000. This ensures that the analysis accurately reflects local variations in income needs while maintaining consistency with research findings.

By implementing these adjustments, the approach redistributes the impact across salary levels, prioritizing the social significance of lower wages. While higher salaries are reduced, the total livable wage-adjusted amount is preserved, such as maintaining a total of $6.98 billion in adjusted salaries across all employees thanks to a negative $301 million Marginal Utility Adjustment as presented in Figure 3. This methodology highlights the diminishing social utility of high salaries while recognizing the vital role of lower incomes in achieving greater social impact.

Figure 3: Intel's Living Wage and Marginal Impact of Income Impact

Minimum Salary	Maximum Salary	Employees	Average Salary	Total Salaries	Living Wage?	Adjusted Average Salary	Adjusted Total Salaries
-	$19,239	637	$19,239	$12,255,243	N	$0	$0
$19,240	$24,439	237	$21,840	$5,175,962	N	$0	$0
$24,440	$30,679	338	$27,560	$9,315,111	N	$0	$0
$30,680	$38,999	472	$34,840	$16,444,244	N	$0	$0
$39,000	$49,919	713	$44,460	$31,699,624	Y	$44,460	$31,699,624
$49,920	$62,919	1587	$56,420	$89,537,747	Y	$56,420	$89,537,747
$62,920	$80,079	3921	$71,500	$280,349,540	Y	$71,500	$280,349,540
$80,080	$101,919	7441	$91,000	$677,127,280	Y	$91,000	$677,127,280
$101,920	$128,959	8999	$115,440	$1,038,840,061	Y	$115,440	$1,038,840,061
$128,960	$163,799	8973	$146,380	$1,313,463,254	Y	$146,288	$1,312,637,738
$163,800	$207,999	7926	$185,900	$1,473,439,437	Y	$181,452	$1,438,184,589
$208,000	-	11374	$208,000	$2,365,792,000	Y	$184,680	$2,100,550,320
Total Unadjusted Salaries		$7,313,439,500					
Total Adjusted Salaries		$6,968,926,896					

The final adjustment examines wage equity by identifying and monetizing disparities between demographic groups. Within occupational categories, average salaries for different groups were compared to those of White male employees. For instance, if White males earned $80,000 in a category while Asian women earned $70,000, the $10,000 gap was multiplied by the number of Asian women in that category. Across all categories, and as presented in the Figure 4, the analysis revealed a total equity gap of $465 million, representing a negative adjustment to the overall wage impact.

Figure 4 : Intel's Wage Equity Impact

	White	Black	NHPI	Asian	American Indian	Two+	Hispanic or Latino
Male							
Executive/Senior Officials & Managers	$0	$0	$0	$0	$0	$0	$0
First/Mid Officials & Managers	$0	$1,874,742	$225,851	$0	$0	$647,789	$3,442,295
Professionals	$0	$34,881,200	$1,162,250	$67,243,936	$1,966,915	$8,436,916	$38,169,650
Technicians	$0	$3,151,998	$238,149	$2,512,800	$1,157,358	$1,509,898	$2,589,139
Sales Workers	$0	$163,361	$0	$0	$0	$23,225	$0
Administrative Support	$0	$73,798	$0	$0	$0	$8,312	$40,267
Craft Workers	$0	$217,249	$66,761	$37,611	$4,710	$138,886	$0
Net Male Impact	$0	$40,362,347	$1,693,010	$69,794,348	$3,128,983	$10,765,025	$44,241,350
Female							
Executive/Senior Officials & Managers	$0	$0	$0	$0	$0	$0	$0
First/Mid Officials & Managers	$5,969,813	$1,017,174	$0	$3,027,323	$246,619	$659,508	$1,672,349
Professionals	$60,581,959	$14,426,171	$390,212	$145,501,128	$1,634,883	$4,370,542	$38,169,650
Technicians	$6,544,841	$1,749,296	$439,536	$2,528,137	$350,593	$1,415,130	$2,589,139
Sales Workers	$492,408	$96,945	$0	$319,526	$0	$0	$0
Administrative Support	$0	$441,090	$0	$0	$0	$248,427	$40,267
Craft Workers	$433,333	$14,701	$0	$0	$58,641	$73,922	$0
Net Female Impact	$74,022,353	$17,745,377	$829,748	$151,376,114	$2,290,735	$6,767,529	$42,471,405
Total Equity Impact	$465,488,325						

After these adjustments, and as highlighted in the Figure 2, the final wage quality impact was calculated at $6.5 billion. This figure highlights areas of strength, such as adherence to living wage standards, while revealing challenges like addressing wage disparities among demographic groups.

In addition to IWAs, the SWACC adjusts the traditional Weighted Average Cost of Capital (WACC) by accounting for ESG-related risks and opportunities (G.A. Kholjigitov, 2023). The SWACC framework modifies both the cost of equity (Kes) and the cost of debt (rs) by incorporating ESG premiums, tax incentives, and other sustainability-related financial factors. The SWACC formula is expressed as follows:

$$SWACC=(((Es\times Kes)+(Ds\times rs\times(1-T)))\ /\ Es+Ds)+PMs$$

Where:

- Es: Value of sustainable equity
- Kes: Required return on sustainable equity, adjusted for ESG risks and opportunities

- Ds: Value of sustainable debt
- rs: Cost of sustainable debt
- T: Effective tax rate
- PMs: Sustainable market risk premium

To understand better the difference between a WACC and a SWACC calculations we can use the example of a traditional manufacturing project and a sustainable energy project as presented in the Figure 5.

Figure 5: WACC and SWACC calculations details

Traditional Manufacturing Project

For a traditional manufacturing project, let's assume the following:

- *Value of debt (D) = $400,000*
- *Value of equity (E) = $600,000*
- *Cost of debt (r) = 5%*
- *Required return to equity (Ke) = 9%*
- *Effective tax rate (T) = 30%*

Calculating WACC for the traditional project

WACC= ((E×Ke)+(D×r×(1−T)))/ (E+D)

=((600,000×0.09)+(400,000×0.05×0.7)) / 1,000,000

WACC= ((600,000×0.09)+(400,000×0.05×0.7)) / 1,000,000

=(54,000+14,000) / 1,000,000=0.068

WACC= 0.068 or 6.8%

Sustainable Energy Project

For a sustainable energy project (e.g., wind farm), we might consider:

- *Value of sustainable debt (Ds) = $400,000*
- *Value of sustainable equity (Es) = $600,000*
- *Cost of sustainable debt (rs) = 4% (lower due to green bonds or other incentives)*
- *Required return to sustainable equity (Kes) = 11% (higher due to perceived risks)*
- *Effective tax rate (T) = 30%*

Calculating SWACC for the sustainable project

SWACC= ((Es×Kes) + (Ds×rs×(1−T))) / (Es+Ds)

= ((600,000×0.11) +(400,000×0.04×0.7)) / 1,000,000

SWACC= (66,000+11,200)/1,000,000= 0.0772

SWACC= 0.0772 or 7.72%

Calculations show that the WACC for the traditional manufacturing project is 6.8%, whereas the SWACC for the sustainable energy project is 7.72%. The higher SWACC for the sustainable project primarily results from an increased required return on equity, which reflects the perceived higher risks associated with the project. Although the cost of debt for the sustainable project is slightly lower, the higher equity cost may make it seem less financially appealing when considering financial returns alone, despite potential non-financial value, such as environmental benefits.

To enable a lower cost of capital for clean energy investments solutions can be provided in three categories: political commitment and climate policy strategies, governance structures and stronger financial markets. (OECD, 2024) Strong political commitment, backed by clear decarbonization goals and robust policies like feed-in tariffs and subsidies, reduces investment uncertainty and stabilizes returns. Initiatives such as the U.S. Inflation Reduction Act illustrate how supportive frameworks drive clean energy adoption. Furthermore, Effective governance structures further strengthen investor confidence by ensuring transparent regulations, reliable contract enforcement, and streamlined permitting. These measures stabilize cash flows, lowering the WACC and enhancing project viability. Finally, strengthening financial markets is also critical, particularly in developing regions. Blended finance models, de-risking tools, and local capacity-building reduce financing barriers and make clean energy projects more competitive.

In summary, the IWAs initiative and the SWACC framework provide a robust and modernised methodology for incorporating ESG factors into company valuations. By translating sustainability efforts into financial metrics, the IWAs Initiative ensures that ESG impacts are reflected in financial statements, providing a clearer understanding of a company's sustainability-driven value. At the same time, the SWACC adapts traditional valuation methods, such as the Discounted Cash Flow (DCF) model, by applying a customised discount rate that takes into account ESG-related risks and opportunities. This dual approach adds precision to valuations as sustainable free cash flows (SFCF) are now appropriately adjusted and discounted using the SWACC. As a result, investors and acquirers are provided with a forward-looking and comprehensive lens through which to assess the financial and strategic impact of ESG initiatives, increasing confidence in decision-making and aligning valuations with companies' broader sustainability profiles.

Conclusion

This work project highlights the growing need for ESG criteria to become a fundamental part of the due diligence and valuation processes in technology M&A. As regulatory landscapes evolve, investors demand more accountability, and the world pushes for sustainable practices, integrating ESG considerations is no longer a choice but a necessity for gaining a clear and balanced understanding of target companies.

The framework developed in this project demonstrates how tools like IWAs and SWACC can move ESG integration from an abstract ideal to a tangible, measurable practice. These tools allow ESG factors to be quantified, enabling investment bankers to evaluate companies more holistically. This approach not only improves the precision of valuations but also brings ESG considerations to the forefront of decision-making, bridging the gap between financial performance and sustainability goals.

Proposing this framework aims to give a first and quick understandable way to include ESG in bankers' reflections. It proves that regulators are starting their effort to really rule ESG considerations and that great minds are already working on this matter. However, without clear financial incentives, ESG efforts risk being dismissed as irrelevant. To truly drive change and if no financial gain is found to pursue ESG considerations, stringent regulations must compel stakeholders to adopt and prioritize sustainability as an integral part of their operations and evaluations.

In the end, I do hope that new regulations and a genuine desire for change will push M&A stakeholders to embrace ESG integration. However, I can't help feeling skeptical on the success of this journey as the industry focus still seems heavily skewed toward high valuation and therefore high fees over meaningful impact. Maybe a global sense of urgency will finally spark change, and I sincerely hope my generation will lead the way in making it happen.

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Appendix 1: Intel’s 2018 EEO-1 Component 2 Report

Section D - EMPLOYMENT DATA: Number of Employees

Job Categories	Salary Compensation Band	Race/Ethnicity														Total
		Hispanic or Latino		Non / Hispanic or Latino												
				Male						Female						
		Male	Female	White	Black	NHPI	Asian	AmInd	Two+	White	Black	NHPI	Asian	AmInd	Two+	
1.1 Executive/Senior Officials & Managers	$19,239 and under	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$19,240 - $24,439	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$24,440 - $30,679	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$30,680 - $38,999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$39,000 - $49,919	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$49,920 - $62,919	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$62,920 - $80,079	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$80,080 - $101,919	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$101,920 - $128,959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$128,960 - $163,799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$163,800 - $207,999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$208,000 and over	0	1	29	1	0	11	0	0	8	1	0	1	0	0	52
1.2 First/Mid Officials & Managers	$19,239 and under	0	0	3	1	0	0	0	0	0	0	0	1	0	0	5
	$19,240 - $24,439	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
	$24,440 - $30,679	0	0	1	0	0	2	0	1	1	0	0	0	0	0	5
	$30,680 - $38,999	0	0	1	0	0	0	0	1	2	1	0	0	0	0	5
	$39,000 - $49,919	0	0	2	0	1	3	0	0	3	0	0	1	0	0	10
	$49,920 - $62,919	3	1	3	1	1	6	0	0	3	0	0	0	0	1	19
	$62,920 - $80,079	3	0	19	0	0	9	0	0	8	0	0	2	2	1	44
	$80,080 - $101,919	6	8	61	10	0	12	0	3	25	1	0	9	0	1	136
	$101,920 - $128,959	27	11	111	8	0	33	3	2	51	4	0	27	0	1	278
	$128,960 - $163,799	50	17	238	22	0	100	3	5	103	20	0	75	2	5	640
	$163,800 - $207,999	86	28	508	32	4	278	5	8	197	13	1	124	2	8	1294
	$208,000 and over	172	65	2021	77	5	1162	25	25	532	33	1	288	6	3	4415
2 Professionals	$19,239 and under	21	8	57	5	0	45	2	4	21	4	0	47	0	1	215
	$19,240 - $24,439	8	5	24	4	0	43	1	2	15	0	0	17	0	1	120
	$24,440 - $30,679	9	5	38	15	0	50	0	3	18	2	0	36	0	1	177
	$30,680 - $38,999	25	10	61	32	0	70	1	9	32	8	0	59	2	2	311
	$39,000 - $49,919	22	15	83	43	0	105	1	5	53	18	0	77	1	2	425
	$49,920 - $62,919	53	17	120	53	1	144	3	13	65	24	2	116	1	2	614
	$62,920 - $80,079	103	53	335	87	3	275	3	16	236	33	0	248	4	17	1413
	$80,080 - $101,919	284	108	1006	148	10	1025	18	55	453	67	2	973	8	22	4179
	$101,920 - $128,959	407	125	1733	216	10	2250	31	61	625	80	4	1565	16	32	7155
	$128,960 - $163,799	479	171	2366	221	6	2564	23	66	677	81	2	1286	8	13	7963
	$163,800 - $207,999	337	80	2317	124	5	2156	29	48	518	40	0	806	6	12	6478
	$208,000 and over	253	50	2826	95	2	2155	16	36	467	23	2	448	3	9	6385
3 Technicians	$19,239 and under	68	11	142	18	3	32	9	11	28	4	2	18	1	5	352
	$19,240 - $24,439	10	3	47	7	0	8	2	2	7	1	1	5	0	0	93
	$24,440 - $30,679	19	4	51	6	0	16	0	3	10	1	0	13	2	3	128
	$30,680 - $38,999	18	5	40	8	1	15	2	1	17	3	1	11	1	1	124
	$39,000 - $49,919	22	8	66	19	2	29	5	5	22	8	3	31	1	6	227
	$49,920 - $62,919	102	44	283	63	2	79	12	17	118	14	2	78	4	14	832
	$62,920 - $80,079	266	71	943	162	17	215	28	45	185	47	6	102	12	16	2115
	$80,080 - $101,919	421	78	1476	158	18	275	39	54	162	26	3	64	6	5	2785
	$101,920 - $128,959	243	24	775	89	8	130	12	13	51	2	2	34	4	0	1387
	$128,960 - $163,799	39	5	134	8	1	35	1	4	16	0	0	37	1	0	281
	$163,800 - $207,999	3	1	23	2	0	8	0	0	6	0	0	11	0	0	54
	$208,000 and over	1	1	4	0	0	1	0	0	2	0	0	5	0	0	14
4 Sales Workers	$19,239 and under	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	$19,240 - $24,439	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	$24,440 - $30,679	0	0	2	0	0	0	0	0	1	0	0	0	0	0	3
	$30,680 - $38,999	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	$39,000 - $49,919	0	2	0	0	0	0	0	0	3	0	0	0	0	0	5
	$49,920 - $62,919	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4
	$62,920 - $80,079	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3
	$80,080 - $101,919	1	0	2	0	0	0	0	0	1	0	0	0	0	0	4
	$101,920 - $128,959	0	1	8	1	0	2	0	0	2	0	0	5	0	0	19
	$128,960 - $163,799	3	3	15	4	0	4	0	1	7	2	0	4	0	0	43
	$163,800 - $207,999	7	3	48	3	0	15	0	1	8	1	0	7	0	0	93
	$208,000 and over	34	7	291	12	1	56	3	3	68	1	1	29	0	2	508
5 Administrative Support	$19,239 and under	1	11	3	1	0	0	0	0	14	12	0	2	0	3	47
	$19,240 - $24,439	0	4	1	1	0	1	0	0	2	4	0	1	0	1	15
	$24,440 - $30,679	0	2	3	1	0	0	0	0	8	2	0	1	0	2	19
	$30,680 - $38,999	0	5	2	1	0	0	0	0	8	1	0	4	0	1	22
	$39,000 - $49,919	0	9	1	0	0	1	0	0	16	4	0	3	0	2	36
	$49,920 - $62,919	1	11	5	0	0	3	0	1	61	4	0	3	1	2	92
	$62,920 - $80,079	2	39	7	0	0	0	0	0	173	11	0	20	4	2	258
	$80,080 - $101,919	0	35	5	0	0	2	0	0	112	4	0	14	1	3	176
	$101,920 - $128,959	0	15	3	0	0	1	0	0	38	3	0	10	0	0	70
	$128,960 - $163,799	0	9	1	1	0	0	0	0	10	2	0	2	0	0	25
	$163,800 - $207,999	0	0	0	0	0	0	0	0	2	0	1	2	0	0	5
	$208,000 and over	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 Craft Workers	$19,239 and under	3	0	8	0	0	0	1	2	3	0	0	0	0	0	17
	$19,240 - $24,439	0	0	5	0	1	0	0	0	0	0	0	0	0	0	6
	$24,440 - $30,679	2	0	2	1	0	0	0	0	0	0	0	0	1	0	6
	$30,680 - $38,999	0	0	5	2	0	0	2	0	0	0	0	0	0	0	9
	$39,000 - $49,919	2	0	4	0	0	1	0	0	2	0	0	0	0	1	10
	$49,920 - $62,919	4	1	16	3	0	0	1	0	0	0	0	0	0	1	26
	$62,920 - $80,079	11	1	50	4	0	8	1	2	10	1	0	0	0	0	88
	$80,080 - $101,919	33	3	99	2	0	8	7	3	3	1	0	0	1	1	161
	$101,920 - $128,959	18	1	62	2	0	1	4	1	1	0	0	0	0	0	90
	$128,960 - $163,799	4	0	16	1	0	0	0	0	0	0	0	0	0	0	21
	$163,800 - $207,999	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
	$208,000 and over	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Number of Employees		3686	1196	18621	1775	102	13446	294	532	5290	612	36	6722	101	205	52618
Previous Year Total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 2: Wage Quality

Marginal Impact of Income Function

Drawing on research that suggests the marginal utility of income decreases as income increases (Layard et al., 2008; Jebb et al., 2018; Diener et al., 1993), we design a function to convert raw salaries into impact values at a marginally decreasing rate. The function is underpinned by two key principles: first, the functional form of the marginal rate, which should show accelerating reduction of the marginal utility of an additional dollar of wages for higher level of wages and, second, identification of an inflection points at which a raw wage should begin to reflect decreasing marginal returns. While we strive to design a functional form and identify an inflection point based on a broadly applicable methodology that is aligned with research on the marginal utility of income, more research is needed to empirically test the nature of the income-impact relationship. Such research could guide applications of the measurement of wage quality.

Functional form

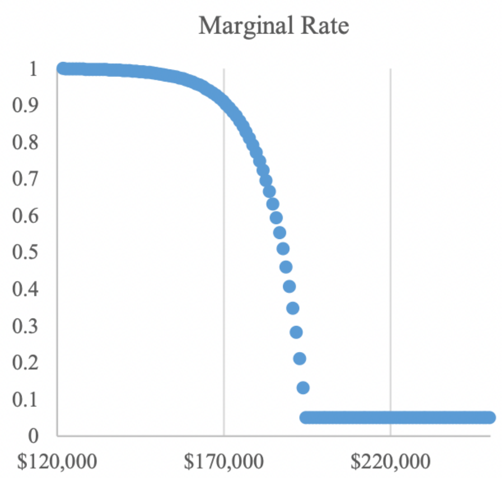
We design a function such that the marginal rate takes a negative exponential functional form. Therefore, the curve that describes the adjusted salaries is a natural logarithm. A1 provides a visual

representation of each function. The inclusion of the marginal impact of income function to our framework provides a method for distinguishing between a firm that pays 10 employees each $10,000,000 in salaries and a firm that pays 1,000 employees each $100,000 in salaries (both pay $100,000,000 in total salaries). The use of a negative exponential function to describe the marginal rate allows for a conservative approach to adjusting salaries above, but close to, the designated inflection point (discussed below). Exhibit 1 and 2, Marginal Rate, begins at $120,000 and shows the marginal rate reaches approximately $182,000 before falling bellowing 0.70. This translates into a salary of $182,000 being adjusted down by approximately $3,000, as shown in Table 23. We construct a discontinuity in the function when the marginal rate reaches 0.05, and set the marginal rate constant at 0.05 for all increased salary values. In this function, the discontinuity is reached at a raw salary of approximately $194,000, which is adjusted to $184,000. Incomes of this level are well above the 90th percentile for individual incomes in the United States, and while it is important to provide some incremental impact for salaries above this value, we posit that the incremental impact is very low compared to lower incomes.

Inflection Point

Jebb et al. (2018) identify the income satiation level for life evaluation is $105,000 on average for North America. We use this value as the inflection point at which the marginal impact of incomes begins decreasing. However, just as the living wage varies across geographies, this average level of income satiation likely varies across geographies. According to the MIT living wage calculator, the average living wage in the US for a family of four (two children, two working adults) is $34,403. We calculate the average living wage for Intel employees to be $39,874, approximately 16% above the national average. To incorporate a contextual measure of location into the inflection point, we increase the average income satiation by 16%, moving from $105,000 to approximately $122,000. Based on the regional income satiation values in the Jebb et al analysis, as well as the availability of living wage estimates in other geographies, we can replicate this location-based adjustment in future analyses. Table 23 describes marginal rate and approximate adjusted salary for intervals of $10,000.

Exhibit A1: Marginal Rate and Raw and Utility-Adjusted Salaries



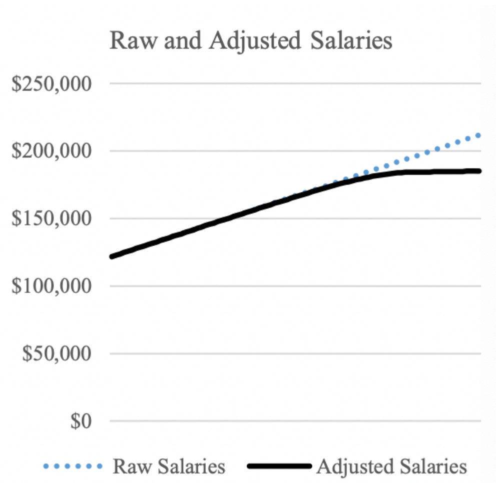


Exhibit 2: Utility-Adjusted Salaries

Raw Salary	Marginal Rate	Adjusted Salary
$100,000	1.000	$100,000
$110,000	1.000	$110,000
$120,000	1.000	$120,000
$130,000	0.998	$129,684
$140,000	0.995	$139,650
$150,000	0.987	$149,562
$160,000	0.966	$159,332
$170,000	0.912	$168,736
$180,000	0.771	$177,190
$190,000	0.407	$183,179
$200,000	0.050	$184,450
$210,000	0.050	$184,950
$220,000	0.050	$185,450
$230,000	0.050	$185,950
$240,000	0.050	$186,450
$250,000	0.050	$186,950