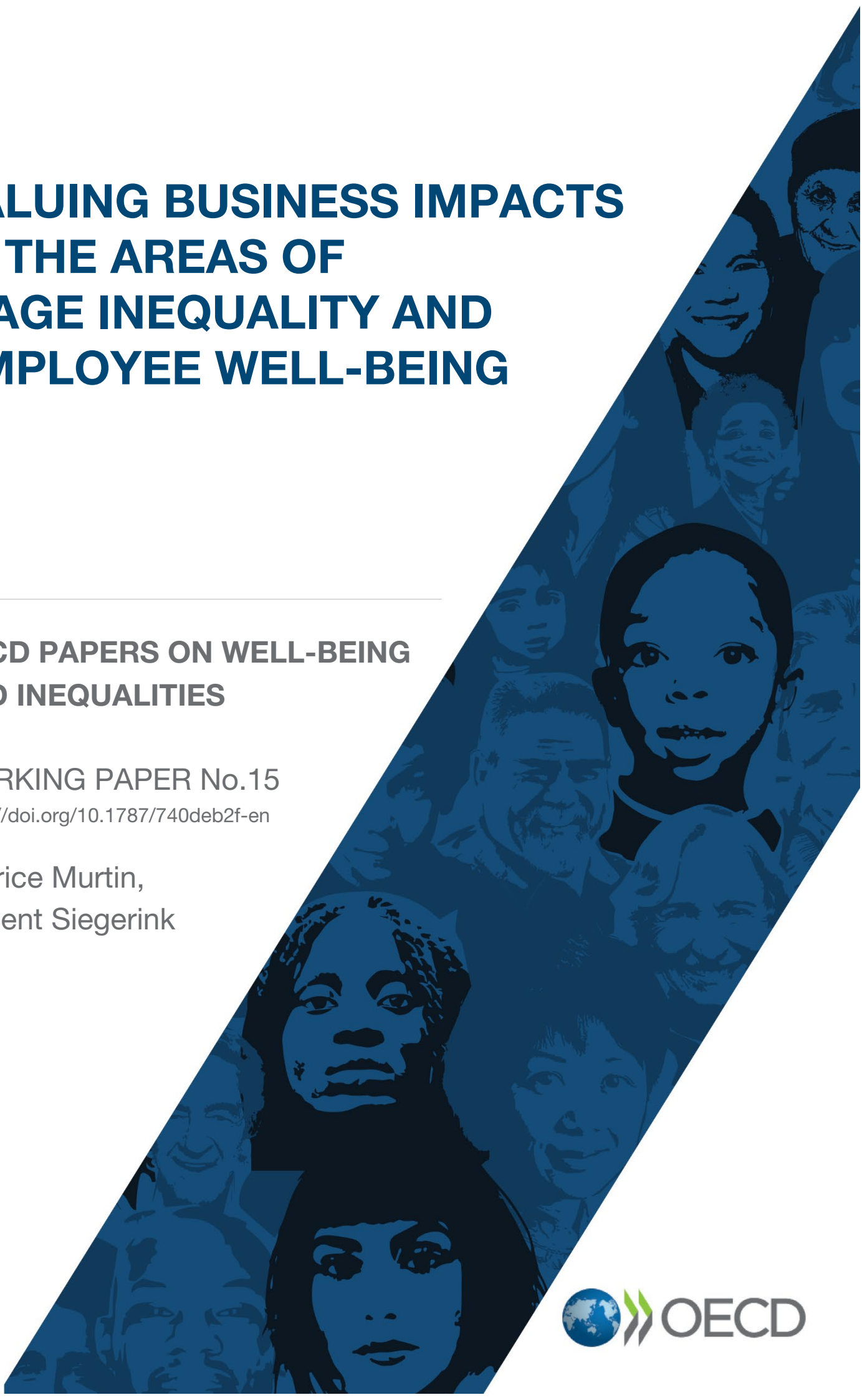
VALUING BUSINESS IMPACTS IN THE AREAS OF WAGE INEQUALITY AND EMPLOYEE WELL-BEING



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Abstract

This working paper proposes a new methodology to monetise five aspects of employee well-being (wage inequality, being employed, excess working hours, relationships with management and job security) using theoretical and empirical frameworks drawn from welfare economics. Preliminary results highlight a large loss of welfare arising from within-firm wage inequality as well as a strong impact of working conditions on workers' well-being. On the aggregate, suppressing the negative externalities of the firm linked to excess working hours, tensions with management and job insecurity would yield an increase in social welfare equivalent to a 25% increase in household income, representing many years of economic growth. Greater transparency on company wage distributions and working conditions is necessary to apply these methodologies to real firms.

Résumé

Ce document propose une nouvelle méthodologie pour valoriser cinq aspects du bien-être des employés (inégalités salariales, emploi, heures de travail excessives, relations avec la direction et sécurité de l'emploi) en utilisant des cadres théoriques et empiriques tirés de l'économie du bien-être. Les résultats préliminaires mettent en évidence une importante perte de bien-être due aux inégalités salariales au sein des entreprises, ainsi qu'un fort impact des conditions de travail sur le bien-être des travailleurs. Dans l'ensemble, la suppression des externalités négatives de l'entreprise liées aux heures de travail excessives, aux tensions avec la direction et à l'insécurité de l'emploi permettrait d'augmenter le bien-être social d'une valeur équivalente à une hausse de 25 % du revenu des ménages, représentant plusieurs années de croissance économique. Une plus grande transparence concernant la distribution salariale et les conditions de travail au sein des entreprises est nécessaire pour appliquer ces méthodologies aux entreprises réelles.

Executive summary

Context

Growing momentum in business social performance measurement and reporting warrants strengthening measurement and valuation frameworks

A recent industry-led Impact Taskforce (ITF) created by the G7 has underlined the importance for businesses and investors to deliver better data on their non-financial performance. This call signifies growing momentum towards a more multi-dimensional understanding of business performance, analogous to the "Beyond GDP" agenda among governments and National Statistical Offices. It encompasses the need to properly account for the risks and dependencies that businesses face in the environmental, social and governance areas, and to better understand the impacts that businesses have on their stakeholders and on society as a whole.

As a knowledge partner to the Business for Inclusive Growth (B4IG) Coalition's Working Group on Impact Measurement, the OECD has developed a methodology to value business impacts in a number of dimensions of the well-being of employees. It proposes a theoretical and empirical framework that incorporates the impact of businesses through three aspects of employees' well-being: the company's wage distribution, being employed and three aspects of working conditions. The findings have strong policy implications regarding the wage structure and the provision of good working conditions.

Monetisation as a way of aggregating and communicating on non-financial performance metrics

Monetisation can serve several purposes for businesses

Over the past years, several organisations and knowledge institutes, including the Harvard Business School Impact Weighted Accounting Initiative (Serafeim, 2019[1]) and the Value Balancing Alliance, have made a strong case for monetary valuation, arguing that it is the language that business understands, that it enables comparing impacts and is highly suitable to support decision-making (HBS Impact Weighted Accounts et al., 2021[2]). An overview of existing frameworks, as compiled by the Value Accounting Network, shows that a range of different valuation and monetisation methodologies have emerged, each with different uses, audiences and objectives (Capitals Coalition, 2022[3]).

The present paper complements an OECD proposal for a set of outcome indicators for B4IG companies, and more broadly the OECD approach to measuring the non-financial performance of businesses through the lens of the OECD Well-being Framework (Siegerink, Shinwell and Zarnic, 2022[4]). The proposal identities a suite of indicators, which would allow firms to identify strengths, risks, and vulnerabilities related to the well-being of their stakeholders. As an additional step, the monetisation of business impacts may offer a helpful tool to communicate on business impacts in monetary terms, a language that business understands. In addition, when all business impacts are expressed in monetary

units, their relative importance can be evaluated, and a hierarchy of action priorities can be established for companies.

Monetisation must be rooted in scientific best practice

In the business setting, valuation and monetisation methodologies of impacts and/or dependencies are still nascent and have been criticised for relying on strong assumptions and ad-hoc parameters and valuation choices that are not supported by economic theory (King, 2021[5]). Methodologies are not always rooted in scientific best practice, even though a significant body of relevant theoretical foundations exists (see *inter alia* (Samuelson, 1974[6]; Nordhaus, 1973[7]; Becker, 2005[8]; Fleurbaey, 2013[9]), for a presentation of monetisation theory). In the empirical domain, (Jenkins, 1997[10]; Jones, 2016[11]; Murtin, 2017[12]; Boarini, 2021[13]), have operationalised the monetisation of income inequality and several well-being dimensions.

Scientific monetisation frameworks rely on a model of individual preferences, in the economics jargon called a "utility function". Using a utility function, the welfare weights of non-monetary dimensions of well-being can be derived in order to assess their equivalent income, or people's willingness to pay for them. These weights reflect people's actual preferences with respect to non-monetary dimensions relative to income. Any weight attributed to non-monetary outcomes or to income inequality therefore reflects the individual and social welfare that is created or destroyed by a change in those outcomes. In particular, in this paper, weights are grounded in well-established economic theory and are not selected or designed in an *ad-hoc* manner by the modeller, as often done in the business literature.

Valuing income inequality and working conditions

Inequality of wages can be valued in welfare terms with a simple formula, and wage inequalities have a negative impact on welfare

In the case of wage inequality, (negative) welfare impacts stem from the diminishing marginal utility of income on welfare, which implies that a euro or dollar spent at the top of the wage distribution provides less social value than a euro or dollar spent at the lower end of the distribution. Following the general methodology described above, this paper proposes a valuation framework where the business impact of a firm is defined as the aggregate welfare of workers, namely the (weighted) average of workers' individual welfare. Under the conditions explained in this paper, the business impact of the firm $\tilde{y}$ can be calculated in monetary terms with the help of a simple formula:

$$\tilde{y} = \bar{y}.\exp(-MLD)$$

where $\bar{y}$ is the average wage paid by the firm, and MLD is the inequality index capturing pay inequality within the firm.

This definition can be operationalised rather easily, contingent on availability of data on the distribution of wages and benefits. As an illustration, this paper provides the example of three firms with identical characteristics in terms of workforce size and average and total wage bills, but with different distributions of wages and benefits. The wage distributions are illustrative and correspond to Gini indices of respectively 0.40 (Firm A), 0.31 (Firm B) and 0.22 (Firm C). While these values are illustrative, they correspond to wage distributions observed in recent years in multinational companies and are in line with what we may expect based on national earnings distributions.

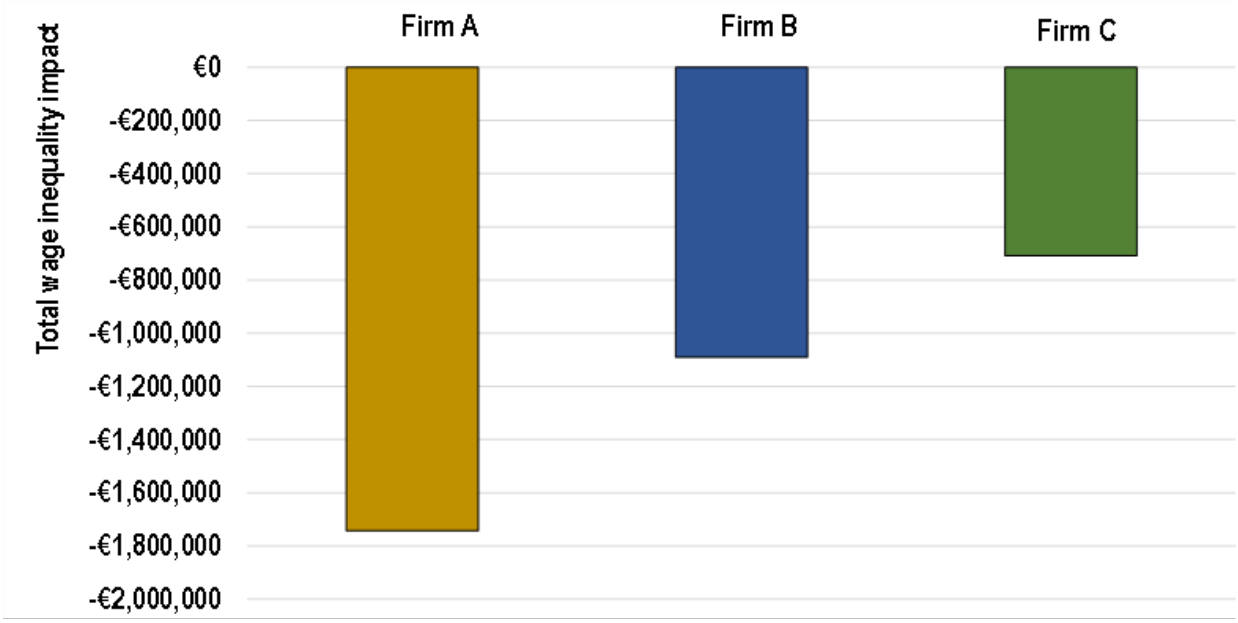
Table A. Three illustrative firms with different (fictitious) wage distributions

	Bottom 10%	2nd decile	3rd decile	4th decile	5th decile	6th decile	7th decile	8th decile	9th decile	1st half of top 10%	Top 5% (excl. top 1%)	Top 1 %
Firm A	€24,000	€30,000	€36,000	€42,000	€48,000	€54,000	€60,000	€72,000	€90,000	€144k	€240k	€960k
Firm B	€32,000	€38,000	€44,000	€50,000	€56,000	€60,000	€68,000	€78,000	€90,000	€120k	€180k	€720k
Firm C	€36,000	€42,000	€48,000	€60,000	€66,000	€72,000	€78,000	€84,000	€90,000	€96k	€120k	€480k

Note: The table presents fictitious wage distributions for three illustrative firms where the amounts represent the annual earnings of employees in the respective deciles or percentiles of the distribution.

The welfare impact associated with wage inequality is computed using the formula presented in this paper and can be expressed in terms of the total business impact, average impact per worker, or as percentage of the company's total wage spending. Figures for total welfare impacts are presented in Figure A, which shows impacts ranging from -€1,742,750 for the most unequal firm among three illustrative firms (Firm A) to -€708,967 to the most equal firm (Firm C), which corresponds to 24.2% and 9.8% of the firms' wage bills, respectively.

Figure A. Total wage inequality impact for three illustrative firms



Note: This figure shows the total monetised welfare impact associated with wage inequality for the three imaginary firms with wage distributions described above.

Companies have a large impact on employee well-being through employment and working conditions

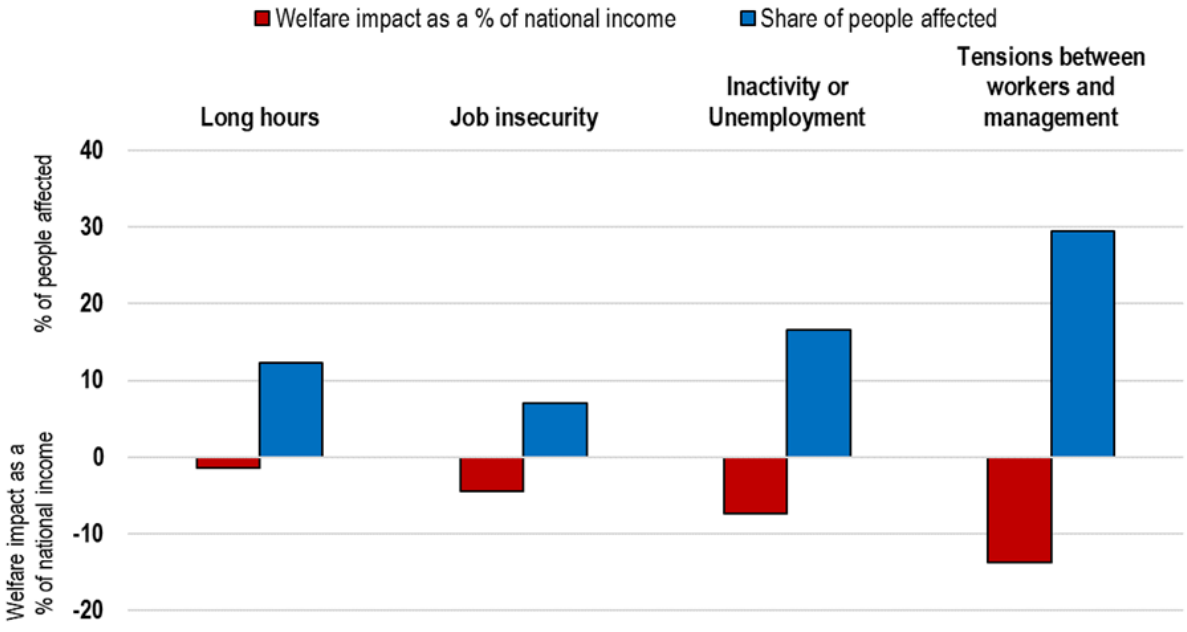
The latter framework can be extended to account for the impact of employment and working conditions on employee well-being. Working conditions, together with labour market security and earnings quality, represent the three components of the OECD Job Quality Framework (which is however different in its construction and objectives as it operates at national level and is used to benchmark job quality across countries). Results at the country level, based on the European Quality of Life Survey, highlight some important externalities that firms exert on workers' well-being:

- employed workers have a higher well-being relative to inactive people
- poor working conditions due to, for instance, excess working hours, tensions with management and high job insecurity have a large negative impact on workers' well-being
- On the aggregate, long working hours, job insecurity, full employment and absence of tension with management have a welfare impact equal to 1.5%, 4.5%, 7.4% and 13.9% of household income, respectively (Figure B).

Overall, these results confirm the existence of potentially large business impacts on social welfare by providing employment and ensuring good working conditions. The total social value that can be reaped through these four channels represents as much as 25% of national income, equivalent to one or two decades of economic growth depending on the country. This large figure underlines the importance of the private sector as a driver of individual and societal well-being through workforce related impacts.

Figure B. Impact of inactivity and bad working conditions

In per cent of average household income



Source: OECD calculations using data from the European Quality of Life Survey.

Table of contents

FIGURES

TABLES

1. Introduction

The industry-led Impact Taskforce (ITF) created by the UK G7 Presidency in 2021 underlined the importance for businesses and investors to rally around delivering better data on the non-financial performance of companies. This call contributes to existing momentum around a multi-dimensional understanding of business performance, analogous to the "Beyond GDP" agenda among governments and National Statistical Offices. It encompasses the need to both properly account for the risks and dependencies that businesses face in environmental, social and governance areas; as well as an understanding of the impacts that businesses have on their stakeholders and society as a whole. As part of its final report, the Taskforce called on standard-setters, academics and other actors to deepen our understanding of how to *value* impacts "in a way that allows a meaningful comparison of the impacts and profits of companies, while also revealing the relationship between the two" (G7 Impact Taskforce, 2021[14]).

Monetary valuation has a long precedent in welfare economics, as various approaches have been used to value non-income dimensions of well-being in order to derive aggregate welfare measures at national level (Becker, 2005[8]; Fleurbaey, 2013[9]; Jones, 2016[11]; Murtin, 2017[12]; Boarini, 2021[13]). The monetary valuation of impact is also considered a useful step in measuring and reporting on business impacts. A group of organisations and knowledge institutes, including the Harvard Business School Impact Weighted Accounting Initiative (Serafeim, 2019[1]) and the Value Balancing Alliance, has published a white paper on the case of monetary valuation, arguing that monetisation is the language that business understands, that it enables comparing impacts and is highly suitable to support decision-making (HBS Impact Weighted Accounts et al., 2021[2]). Impact valuation comes with some conceptual and measurement challenges, however, and existing frameworks and approaches have been criticised for heavily relying on strong assumptions (King, 2021[5]). In addition, existing methodologies rely on ad-hoc parameter and valuation choices that are not based on a unified framework that is strongly grounded in economic theory.

This note proposes a theoretical and empirical framework to estimate the welfare impact of three important aspects of the well-being of employees: wage inequality, being employed, and working conditions. These dimensions are related to the three pillars of the OECD Job Quality framework, which operates at national level and compares countries in terms of Earnings Quality – compounding average wage and wage inequality – Labour Market Security and Quality of the Working Environment as measured by the Job Strain index (Cazes, Hijzen and Saint-Martin, 2015[15]). Yet, as this study operates at firm level, there are methodological differences with the OECD Job Quality framework: selected indicators are different, and they are aggregated in our study. In practice, this paper draws from an existing methodology that uses a social welfare function to aggregate all individual outcomes (Boarini, 2021[13]). As opposed to existing monetary valuation frameworks for businesses, the approach is strongly rooted in the welfare economics literature. In this framework, business impact is defined as the aggregate social welfare of employees in the firm. This definition implies that the social value of the firm is equal to the monetised welfare of its employees.

This paper represents a first attempt at monetising a subset of components of the social performance of firms, and does not capture the full range of multi-dimensional aspects of employee well-being (such as having a voice in decision-making processes, discrimination, or mental health) nor does it capture

business impacts on other business stakeholders, such as value chain workers, consumers, communities or the environment (Siegerink, Shinwell and Zarnic, 2022[4]). Despite the limited scope, the findings have strong policy implications regarding the wage structure of the firm, incentives on hiring and firing practices, as well as incentives to improve the quality of the working environment.

In this framework, business impact is defined as the aggregate social welfare of workers composing the company. This definition implies that the social value of the firm is equal to the monetised welfare of its workers, which ensures a full alignment of the social reporting of the firm and the interest of workers. While the OECD has developed a methodology to calculate welfare at national level using a social welfare function to aggregate individual outcomes (Boarini, 2021[13]), the framework introduced in this paper applies this methodology to the business setting.

The paper is structured as follows. Section 2 reviews the literature and institutional approaches to impact measurement and valuation in the business sphere. Section 3 presents the empirical approach to monetising the impacts of wage inequality. Section 4 provides an extended empirical framework that also integrates the social benefits from being employed as well as the well-being impact of working conditions.

Existing approaches to business impact measurement

Measuring non-financial performance and business impact

Companies are increasingly making commitments to play their part in reducing societal inequalities, for instance by striving for more inclusive workplaces and supply chains. Such efforts could be made more impactful by adopting strong and credible measurement frameworks that provide a better understanding about what works and that help companies be accountable for their impact on society and the environment. A comprehensive measurement effort should include monitoring what actions companies are taking, as well as the outcomes these actions have on stakeholders.

Estimating value created and eroded for different stakeholders is one way of communicating about company's sustainability impacts, as well as of shaping responsible business decisions. The Impact Management Platform[1], a collaboration between leading providers of sustainability standards, including the OECD, has identified valuation as one of the actions in a sequence of steps related to impact management. Impact monetisation is, however, only one step in the impact management and measurement process, and needs to be preceded by other steps, including setting a governance and management approach, defining objectives, identifying sustainability topics or impact areas, and measuring sustainability performance.[2]

In general, valuation approaches should cover the broad range of ways in which businesses contribute to the well-being of their stakeholders and to the environment. Businesses should first identify the "sustainability topics" that should be measured and valued. In this respect, the OECD approach to measuring non-financial performance of business provides a relevant list of topics (see Box 1.1). Not all of these areas are currently covered by the valuation methodology presented in this note, which focuses on wage inequality and three aspects of working conditions. Further work should cover a broader range of employee-related impacts, as more extensive data collection on well-being outcomes will be made available by firms.

[1] See the website of the Impact Management Platform here: https://impactmanagementplatform.org/.

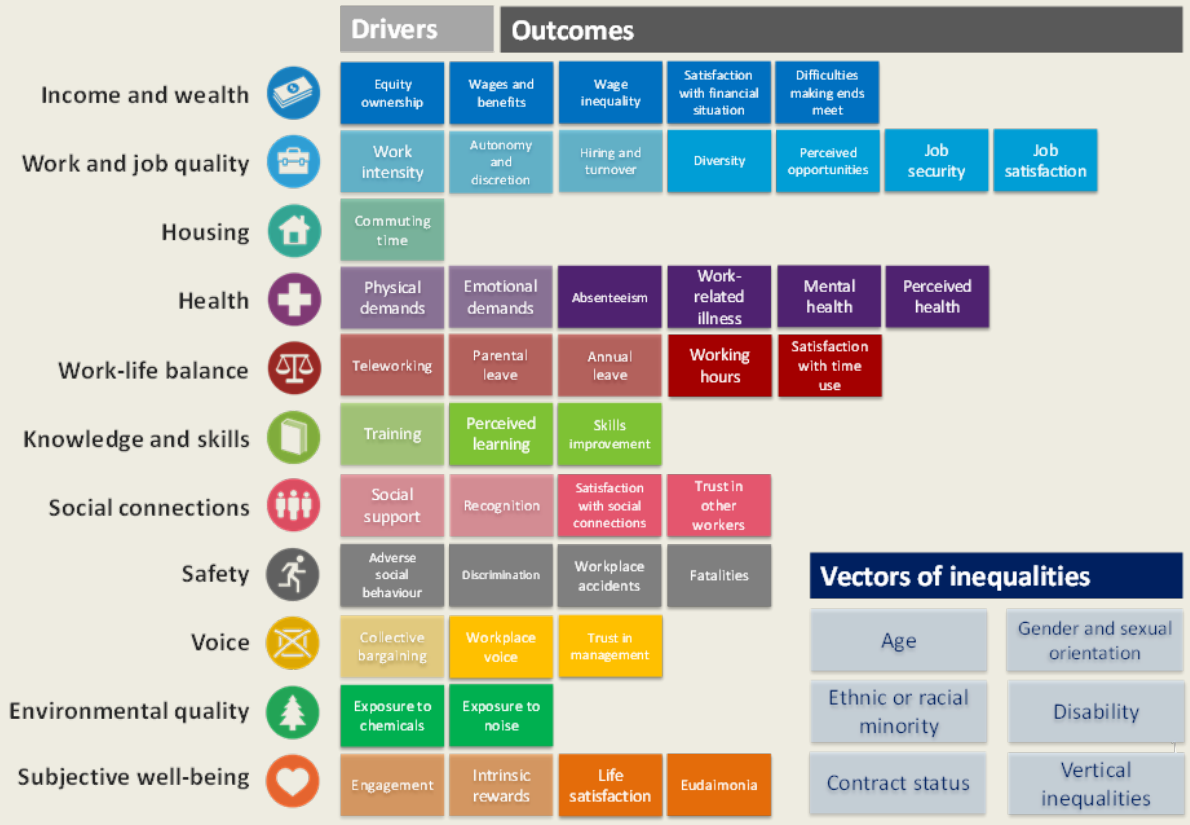
[2] See the "Organisations" view of the Impact Management Platform.

Box 1.1. Measuring the non-financial performance of firms through the lens of the OECD Well-being Framework

The OECD's framework on measuring the non-financial performance of firms (Siegerink, Shinwell and Zarnic, 2022[4]) has identified a number of core components of firms' social performance: the well-being of employees and workers in the value chain, product impacts and the well-being of consumers, the well-being of communities in the supply chain, and the capital resources that firms create and deplete that are relevant to society as a whole.

In addition to this overarching conceptual framework, the framework features an indicator set centred on the well-being of employees (Figure 1.1). This set of indicators is multi-dimensional, focuses largely on outcome indicators, and includes both objective and self-reported measures of well-being. It encompasses ten dimensions of well-being, namely employment, earnings, work-life balance, knowledge and skills, health, safety, social support, voice, environmental quality and subjective well-being. It also recommends considering horizontal and vertical inequalities in each part of the measurement framework. The proposed indicators can be partially derived from administrative data, and partially need to be collected through employee surveys.

Figure 1.1. An indicator set for measuring employee well-being



Source: (Siegerink, Shinwell and Zarnic, 2022[4]), "Measuring the non-financial performance of firms through the lens of the OECD Well-being Framework", *OECD Papers on Well-being and Inequalities*, https://doi.org/10.1787/28850c7f-en and OECD Employee Well-being Survey.

Aggregation of well-being impacts via monetisation

While dashboards provide useful information to monitor progress and performance, valuation approaches have the potential to aggregate well-being data in a way that can facilitate their use in decision-making processes. For instance, in the context of public policies, economists and policy makers have grappled with the question of how to aggregate the various costs and benefits of policies in order to make informative statements about their combined merits. In the absence of any aggregate welfare measure, it remains difficult to make comparisons of *overall* well-being across countries and time.

Monetisation approaches in welfare economics

(Nordhaus, Houthakker and Solow, 1973[16]) were first to devise a monetary summary measure of well-being that incorporated some aspects of quality of life, followed by further advances in the early 2000s by (Frey, Luechinger and Stutzer, 2004[17]) and (Ferrer-i-Carbonell and van Praag, 2002[18]), among others. Recent theoretical and empirical advances in welfare economics have provided new and stronger foundations for aggregating across well-being dimensions (OECD, 2018[19]). Relevant indicators typically use willingness-to-pay for non-monetary dimensions as aggregation weights for those dimensions. [3] Hence, weights reflect preferences of people with respect to non-monetary dimensions relative to income, or said differently, their income equivalent. Key examples include (Fleurbaey, 2009[20]; Jones, 2016[11]; Fleurbaey, 2013[9]; Decancq, 2016[21]), and (Boarini, 2021[13]). A particularly well-founded approach here is the measurement of equivalent income (or money-metric utility, (Samuelson, 1974[6])) to value non-income dimensions. The equivalent income approach has the virtue of providing consistent welfare evaluations even when individuals do not hold the same preferences (Decancq, 2015[22]).

Monetisation approaches in the business setting

In the business setting, it is argued that monetary valuation is a convenient way of representing business impacts as it represents language that business decision-makers understand, enables comparability and can be easily integrated in traditional accounting systems (VBA, IWAI, SVI, and other organisations, 2021[23]).

Monetising company's impacts can be done from two different perspectives (Barby et al., 2021[24]):

- The first, an **enterprise cost-based accounting approach**, goes beyond traditional accounting methods, considers how a firm's impacts on stakeholders and the external environment erode or contribute value for the organisation, which is dependent on these for its own future (financial) success. This boils down to pricing possible risks, intangible assets, and erosion of natural resources that should be part of a firm's accounting if to the latter ought to be a tool that adequately inform decision-makers and investors of the company's assets and liabilities.
- The second, a **societal valuation-based approach**, considers the value of the organisation's impact on the stakeholders that experience these impacts. The price or value that is allocated to impacts in this case represents not the value of these assets and liabilities *to the firm*, but to *society as a whole*. This is the perspective through which the present note makes its contribution. Importantly, though, what is good for society is often good for businesses and investors, especially in the long run (Fornell, Morgeson and Hult, 2016[25]; Edmans, 2011[26]; Krekel, Ward and DeNeve, 2019[27]).

[3] Some composite well-being indicators are not expressed in monetary terms, such as the Human Development Index (HDI). They typically rely on ad-hoc choices for aggregation weights which cannot be interpreted as a willingness-to-pay for non-monetary well-being dimensions. These composite indices have poor scientific value and low utility for policy-making. For instance, Ravallion (2012) finds puzzling implicit valuations of life expectancy in the HDI.

Box 1.2. Existing impact monetisation frameworks and their limitations

The methodologies proposed by the Impact Weighted Accounts (IWAI) Initiative of the Harvard Business School, now the International Foundation for Valuing Impacts, and the Value Balancing Alliance (VBA) are two prominent examples of societal monetary valuation approaches. These initiatives have provided a starting point for a discussion around impact valuation in the business context, and initial results have shown the potential of these approaches in communicating impact to decision-makers effectively (VBA, 2021[28]; HBS Impact Weighted Accounts et al., 2021[2]). The workforce related impacts covered by these frameworks span a subset of well-being dimensions.

The IWAI proposes a methodology for valuing firms' employment outcomes mainly in three well-being dimensions (and inequalities therein), namely employment, income and wealth and health, as well as some components of work-life balance and safety (Freiberg, 2021[29]). First results at scale, on a sample of over 2000 firms, have yielded interesting insights in what monetary estimates of employment impact might look like (Fadhel et al., 2021[30]). The mean employment impact intensity, which only covers two well-being dimensions (employment and income and wealth), is estimated at $56,299, with a median of $57,181. The largest driver of this impact is wage quality (wage levels corrected by living wage, equity, and marginal utility adjustments), whereas "opportunity" impacts constitute a smaller contribution to organisations' impacts. The study also finds positive strong positive correlations between employment impact and the "S" ratings provided by a number of rating providers, suggesting that the methodology captures some of the same information.

Some of the components of this methodology and its underlying assumptions are not supported by economic theory. For instance: i) the methodology accounts for the decreasing marginal utility of income but only after a set threshold, while in reality the marginal utility of income decreases at each point in the income distribution, ii) the living wage is used as a sustainability threshold, suggesting that wages above the living wage threshold are inherently sustainable, establishing a welfare threshold that is not rooted in empirical evidence, and iii) the methodology relies on an average estimate of the living wage that does not reflect the heterogeneity of households conditions. Those assumptions de facto imply under-estimating the impact of wage inequality.

The socio-economic impacts covered by the VBA methodology cover four dimensions of current well-being, namely income and wealth, knowledge and skills, health, and safety, as well as contributions to economic capital, in the form of value added. The VBA methodology is rooted in the idea that by establishing impact pathways, data on business activities and inputs, called impact drivers, can be used to monetise impact. While in the environmental dimension, the causal link between specific business activities and their environmental impact (e.g. between material resource use and biodiversity impacts) can be based on scientific evidence, this assumption is more fragile in the social area, where implementation effects and confounding factors can interfere in the impact pathways. For example, in the area of training, the quality and effectiveness of training likely is highly heterogeneous, and thus applying a generalised estimate of the returns to training does not allow for understanding the true impact of training conducted by a specific firm. Measuring outcomes is in many cases a necessary step to understand and monetise impact.

Caveats and way forward

While aggregation approaches and monetary valuation have their advantages, a discussion around their limitations is warranted (see also Box 1.2). A few important caveats have been offered in the literature. While (Sen, Stiglitz and Fitoussi, 2009[31]) were open to the idea of aggregating components of current well-being, they argued that in the area of sustainability, measures of different types of capital should be considered separately because each stock needs to be maintained above a sustainability threshold, and one well performing capital cannot be substituted for another. They also questioned whether monetary valuation would in practice be feasible from a computational standpoint.

This argument, on the "economic calculation problem", was also put forward in a recent piece by (King, 2021[5]), who suggest that adequately valuating all the aspects of a business' impact necessarily involves an immense analytical effort. In the meantime, the challenges of valuating impacts imply that business impacts may be misrepresented and that certain impacts may not be well reflected in accounting or valuation statements.

While valuation approaches can account for horizontal inequalities, or inequalities between groups, using a single metric may make such inequalities less salient to decision-makers. A related concern is put forward by (Thoma, 2021[32]), who argues that even allowing for equity-weighting, using a single metric requires making assumptions about distributional concerns. These assumptions, which may involve arbitrary value judgments if not underpinned by evidence-based distributional preferences, are not necessarily obvious to the users of such metrics. This endows significant power and authority to those responsible for producing such metrics. Indeed, the approach presented in the present note requires making assumptions about population preferences for inequalities, which result in a spectrum of potential results.

For these reasons, among others, the OECD currently presents measurement tools such as its Well-being Framework and Job Quality framework as dashboards, rather than aggregated (monetised) indices (Cazes, Hijzen and Saint-Martin, 2015[15]). Monetary valuation methods can be used as complementary tools to dashboard approaches, rather than substitutes, especially in the business setting, where monetised values speak to decision-makers. In particular, given the current state of art in monetary valuation, this is likely to be useful to represent particular areas of business impacts that are well-understood. However, valuation techniques ought to be rooted in robust methodologies, grounded in economic theory, and should explicitly acknowledge what impacts they cover, and what impacts they may not cover. As an additional general principle, impact valuation methodologies should clearly present their assumptions and limitations.

The present paper intends to provide a contribution to the impact monetisation landscape in three dimensions of the OECD's framework for measuring non-financial performance, namely Income and Wealth, Work and job quality and Social connections (Table 1.1). Indeed, this does not mean that the impacts described here provide a comprehensive picture of the (monetised) workforce related impacts of a firm. Even within these three dimensions, there are additional well-being indicators that are not captured by the present methodology, due to data or other limitations.

Table 1.1. Employee well-being impacts covered

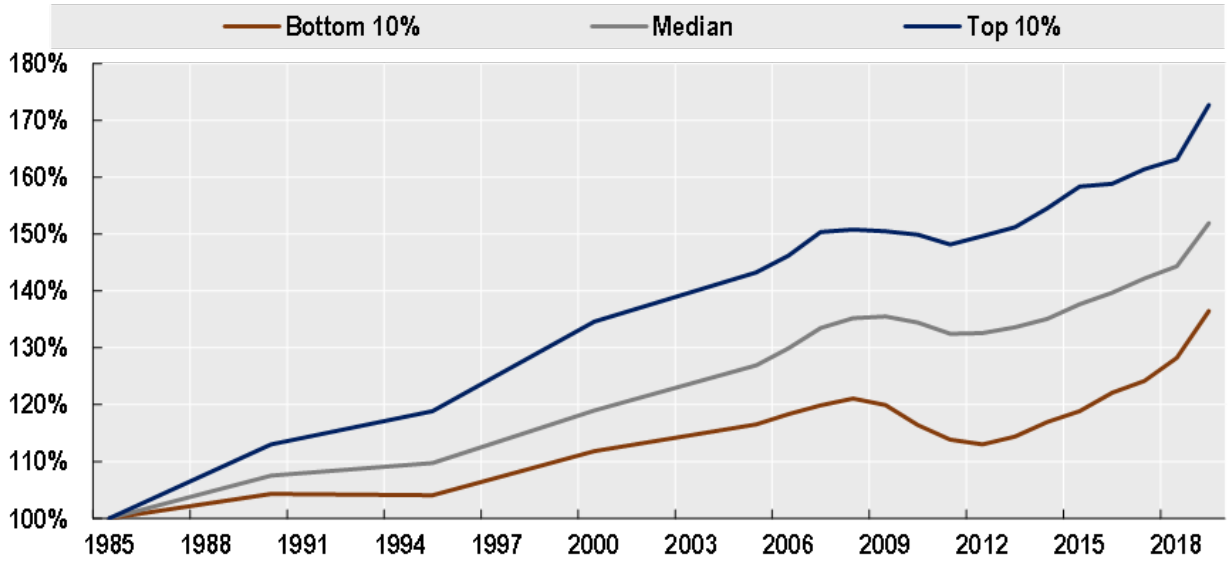
Well-being dimensions covered by the present framework (in purple)	Indicators covered	Method	Data limitations
Income and wealth	Wage inequality	Impact inequality adjustment using Atkinson's social welfare function. The methodology accounts for the diminishing marginal returns of income on social welfare and possible aversion to inequality.	No firm-level wage distribution data. Impacts are estimated using illustrative wage distributions
Work and job quality	Being employed	Impact of working conditions and being employed using a utility function to compute equivalent income with heterogeneous preferences at the national level.	No micro-data of working conditions, household income and life satisfaction at the firm-level. Impacts are estimated at the national level using country-level microdata
	Working hours		
	Job insecurity		
Housing	X		
Work-life balance	X		
Health	X		
Safety	X		
Knowledge and skills	X		
Social connections	Tensions with management (proxy)	Impact of working conditions and being employed using a utility function to compute equivalent income with heterogeneous preferences at the national level.	No micro-data of working conditions, household income and life satisfaction at the firm-level. Impacts are estimated at the national level using country-level microdata
Voice	X		
Environmental quality	X		
Subjective well-being	X		

Finally, it is useful to clarify the difference between our selected variables and those composing the official OECD Job Quality (JQ) Framework (Cazes, Hijzen and Saint-Martin, 2015[15]), which is used to benchmark the quality of jobs across countries. The latter framework has three pillars: Earnings Quality, which compounds average wage and a penalty for wage inequality; Labour Market Insecurity, which is measured by the share of income that is lost when a worker loses job and falls under the unemployment insurance regime; and Quality of the Working Environment, measured as the share of workers who face more negative working conditions as compared to the positive working conditions they benefit from. By comparison, our study also yields a penalty for wage inequality but it is calculated differently: it relies on the definition of a concave utility function rather than on the choice of a specific parameter for aversion to inequality; our study also features a self-reported job insecurity variable, while the JQ framework uses only objective information on the unemployment risk and the design of unemployment insurance, which are not in the remit of individual businesses; finally, our study takes stock of two working conditions (long working hours and tensions with management) that are monetised, while the JQ framework considers more working conditions (e.g. time pressure at work, physical health risks, work autonomy and learning, social support at work) but does not monetise them. Due to data availability, it was not possible to consider more working conditions as in the JQ framework.

2. Monetising the impact of wage inequality

In many advanced countries, inequalities are at modern-time highs and have increased significantly in the last few decades. In most recent data, the average income of the top 10% richest people was about 9.3 times that of the poorest 10% (for the year 2019), and between 1985 and 2019, the average income of the richest 10% grew by 73%, compared to merely 36% for the bottom 10%, in a subset of 15 OECD countries (OECD, 2022[33]). In the United States, almost half of all income growth in the three decades after 1985 accrued to the top 1%, doubling its share in total income from 11% to 20% (OECD, 2019[34]). According to the Economic Policy Institute, CEO pay increased by an impressive 1322% between 1978 and 2020 on average in the 350 largest publicly owned U.S. firms (Economic Policy Institute, 2021[35]). Wage inequality explains only a part of the inequality in total income, but it plays an important role. This trend remains unchanged despite growing awareness, even at business' leadership level. Indeed even during the first pandemic year, average CEO pay was estimated to have increased by 19% relative to the year before (Economic Policy Institute, 2021[35]).

Figure 2.1. Real disposable income growth by income position, average for 15 OECD countries, 1985-2019 (1985 = 100%)



Note: Unweighted average for 15 countries for which long-term data are available: Canada, Germany, Denmark, Finland, France, United Kingdom, Greece, Israel, Italy, Japan, Mexico, Netherlands, Norway, New Zealand and Sweden
Source: OECD calculations based on *OECD Income Inequality Database* (2022), https://data.oecd.org/inequality/income-inequality.html.

Inequality and welfare

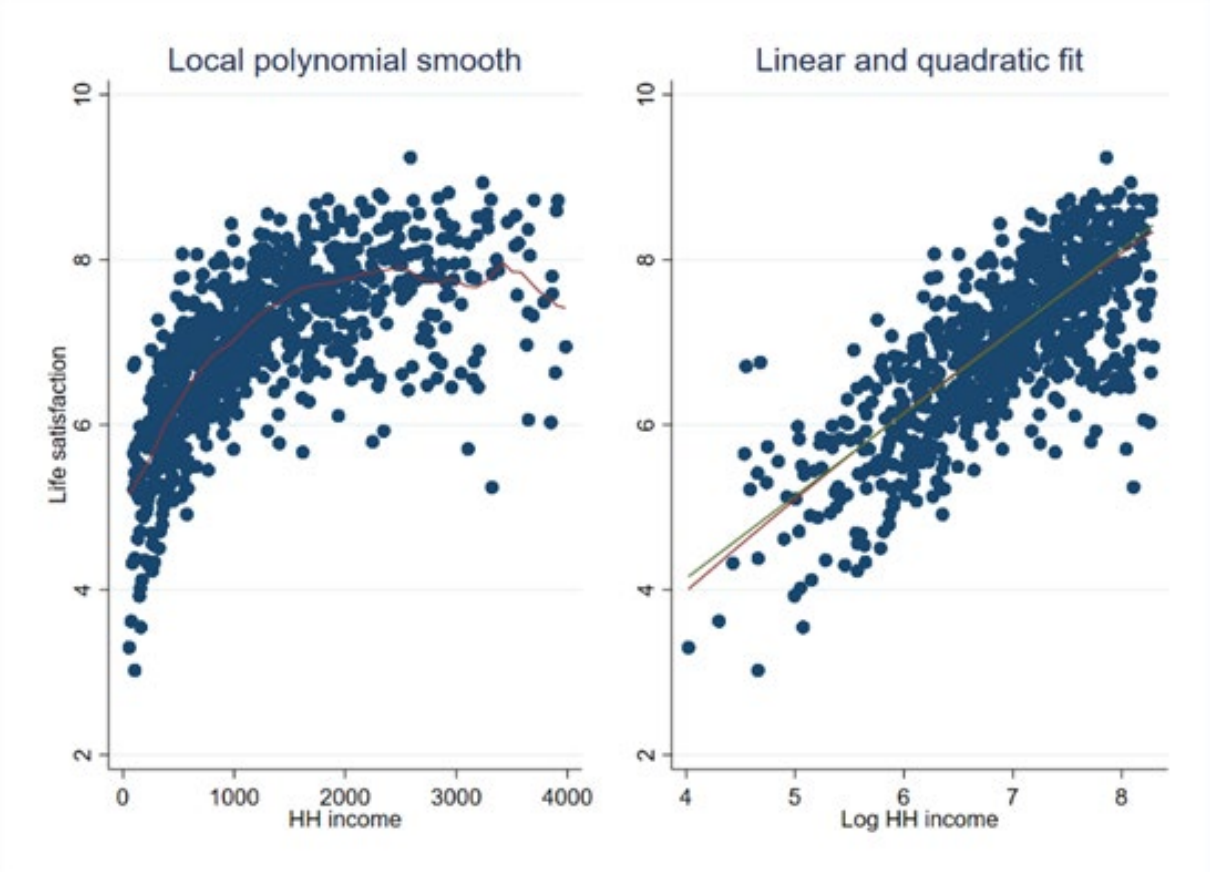
The theoretical framework for measuring wage inequality impacts on the social value of companies, presented in Box 2.1, rests on the idea that firms can make an impact by distributing their wages more equally across the wage distribution. The foundation of the framework reflects an important aspect of the relationship between income and welfare (and social value), namely that of diminishing marginal returns of income on welfare, or the idea that every additional dollar or euro of income earned yields a diminishing benefit for the welfare of an individual. This observation is rooted both in social welfare theory (Atkinson, 1970[36]) as well as in empirical observations. Indeed, a growing body of literature has pointed out that income yield diminishing returns to subjective well-being, whether measured in terms of experienced well-being (or affect) or life evaluation (Jebb et al., 2018[37]; Kahneman and Deaton, 2010[38]; Killingsworth, 2021[39]). Some of these studies have suggested that there is a satiation level, above which an increase in income does not yield further welfare benefit, or even decreases well-being, although this latter observation remains inconclusive.

Social welfare theory and the idea of decreasing marginal utility of income on welfare has some intuitive appeal. At lower levels of income, additional income may help to provide essential needs and alleviate material hardship: at the most basic level, food and shelter, education, access to healthcare, durable goods (Wang, Cheng and Smyth, 2017[40]). At higher levels of income, additional income may be spent on more hedonistic or even conspicuous types of consumption, such as vacations or luxury goods. While more of the latter may still increase an individual's welfare, every dollar spent has a significantly lower contribution to the individual's welfare than a dollar spent by a comparable individual in a lower part of the income distribution.

Figure 2.2 depicts average life satisfaction for each decile of national income distributions for 28 OECD countries between 2003-2016. As shown on the left panel, the profile of life satisfaction is concave relative to income, implying that the marginal utility from one additional euro is larger for the poor than for the rich. This is a critical observation for the purpose of estimating wage inequality impacts because it is the reason why wage inequality is associated with a negative business impact.

Figure 2.2. The relationship between life satisfaction and household income in Europe

OECD European Countries 2003-2016



Note: Household income is equivalised by the square of household size. Life satisfaction and household income averaged by country and year-specific deciles as well as two top vintiles.
Source: European Quality of Life Survey and OECD calculations.

Box 2.1. Theoretical framework for measuring wage inequality impacts

Defining individual welfare

We first propose a theoretical framework for estimating the social value of firms, which consists of aggregating welfare of individual workers within the firm.

At the level of the individual worker, welfare is defined as the lifetime utility drawn from income. Under the assumption of perfect annuity markets and an interest rate equal to the actualization rate, the solution of the optimization problem of the representative agent is a level of consumption equal to income (see Becker et al. (2005)). Indirect utility is separable and equal to the product of instantaneous utility and a discount factor that is a function of longevity. As the health dimension is left aside in this section, welfare can simply be defined as the instantaneous utility function that is assumed to be a logarithmic function of income with an intercept y_0:

$$w_i = \log\frac{y_i}{y_0} \qquad (1)$$

As a normalisation, utility of death is equal to zero, and parameter y_0 corresponds to the level of consumption at which the individual is indifferent between being alive or dead. This parameter is calibrated on a Value of a Statistical Life (VSL) equal to 6.3 millions USD in the US in 2004, the US Environmental Protection Agency

benchmark.[4] As a result, the parameter y_0, yielding a VSL of 6.3 million in 2004, is equal to 130.96 (see (Boarini, 2021[13])).

A theoretical framework for the social welfare of the firm and the value of wage inequality

The business impact of a firm is defined as the social welfare of its workers. To aggregate all workers' individual welfare as created by the firm, it is classically proposed to use the social welfare function introduced by Atkinson (Atkinson, 1970[36]), and define the social welfare of the firm as the generalised mean of workers' individual welfare[5] with a coefficient of inequality aversion τ:

$$BI = \left(\frac{1}{n}\sum_i (w_i)^{1-\tau}\right)^{\frac{1}{1-\tau}} = \left(\frac{1}{n}\sum_i w_i\right)(1-I) \qquad (3)$$

where $I \equiv 1 - (\sum_i (w_i)^{1-\tau}/n)^{\frac{1}{1-\tau}}/(\sum_i w_i/n)$ is the Atkinson-Kolm-Sen index of inequalities in individual welfare, and *n* the number of workers in the firm. Importantly, as noted above, because the utility/welfare function is concave, the marginal utility of income decreases as income increases. Business impact is defined as the average welfare of its workers, penalised for inequality in workers' welfare. In the empirical applications shown below, different degrees of aversion to inequality can be considered. The case τ = 0 corresponds to the absence of aversion to inequality, in which case business impact is just equal to the average welfare of workers, and thus renders a conservative estimate of the impact of wage inequality, in the case where no aversion to inequality exists. Finally, total business impact can conveniently be defined as:

$$TBI = \mathrm{n}.BI \qquad (4)$$

Conveniently, business impact can be expressed in monetary terms as the *representative income* level $\tilde{y}$ that would yield a certain level of business impact *BI* if it were paid to all workers in the firm:

$$BI = \log \tilde{y}/y_0 \qquad (5)$$

since in this case, $w_i = \log \tilde{y}/y_0$ for all workers and $I = 0$ in equation (3). Combining (1), (3) and (5) yields the closed-form expression for the representative wage:

$$\tilde{y} = y_0.exp\left(\left(\frac{1}{n}\sum_i \left(\log\frac{y_i}{y_0}\right)^{1-\tau}\right)^{\frac{1}{1-\tau}}\right) \qquad (6)$$

In the benchmark case where one ignores aversion to inequality and imposes τ=0, equation (6) takes a very simple and intuitive form, as it can be re-written as:

$$\tilde{y} = \exp\left(\frac{1}{n}\sum_i \log y_i\right)$$

$$\text{Or } \tilde{y} = \bar{y}.\exp(-MLD) \qquad (7)$$

where $\mathrm{MLD} = -\frac{1}{n}\sum_i \log\frac{y_i}{\bar{y}}$ is the Mean Log Deviation index of inequality. Equation (7) highlights the proportion of average income that is lost in welfare terms due to income inequality. This welfare measure has already been used in past academic studies (see (Jenkins, 1995[41]; 1997[10])).

Applying this framework to national income distributions, on average across G7 countries, inequality in primary income implies a loss of 30% of income in welfare terms. This loss is higher in more unequal countries such as the US and the UK, and is lower in Italy and Canada.

[4] See (Dockins, 2004[53]) (p. 4): "EPA's Guidelines advise analysts to use a central VSL estimate of $4.8 million in 1990 dollars. Based on the gross domestic product (GDP) deflator this converts to approximately $6.2million in 2002 dollars.This value is derived from 26 estimates assembled for EPA's first retrospective analysis of the Clean AirAct. Each estimate is from a different study,with 21 of the estimates from hedonic wage studies and the remaining five derived from contingent valuation (CV) studies. Until 2003, the estimate from EPA's Guidelines was uniformly applied to mortality risk reductions across program offices. EPA recently used an estimate of $5.5 million (1999 dollars) in its analysis of reduced mortality from air regulations."

5 For a discussion of Atkinson's measure see (Deaton, 1980[52]).

Applying the framework to monetise the wage inequality impact in three illustrative business scenarios

In the absence of data on real world company wage distributions, this paper presents a simulation that applies the theoretical framework presented in Box 2.1 to firms with three illustrative wage distributions (Table 2.1). The firms are identical in the size of their workforce and total spending on wages. However, each firm has a different (fictitious) wage distribution. Firm A is the "less equal" firm. The 10 employees at the bottom end of its wage distribution each earn €24,000 a year, while the median wage is €54,000. Meanwhile, the single person at the top of the wage distribution (for example, the CEO), earns €960,000[6]. The equivalent Gini index of this wage distribution equals 0.40. In firm C, the "more equal firm", the bottom 10% earn €36,000 and the CEO earns €480,000, which translates into a Gini index of 0.22. The wage distributions of these firms and associated Gini indices correspond to observations of wage distribution inside real businesses (Morais and Kakabadse, 2014[42]), and appear to fall within the realm of what may be expected given national earnings distributions (see also Box 2.2).

The examples provided serve to illustrate the main features of the methodology presented in this paper. First, for simplicity, this paper refers to the inequality in compensation received by a firm's employees as wage inequality. In practice, the compensation received by a firm's employees extends beyond wages and salaries to other forms of benefits, such as insurance and pensions, as well as variable payments such as bonuses, commission, and stock options. In order to comprehensively calculate the welfare impact of wage inequality, the compensation included in the computation of the distribution of wages should include the full suite of wages and benefits received by employees. This is in line with the approach used by (Morais and Kakabadse, 2014[42]) in computing a Corporate Gini Index.

Table 2.1. Three imaginary firms with different wage distributions

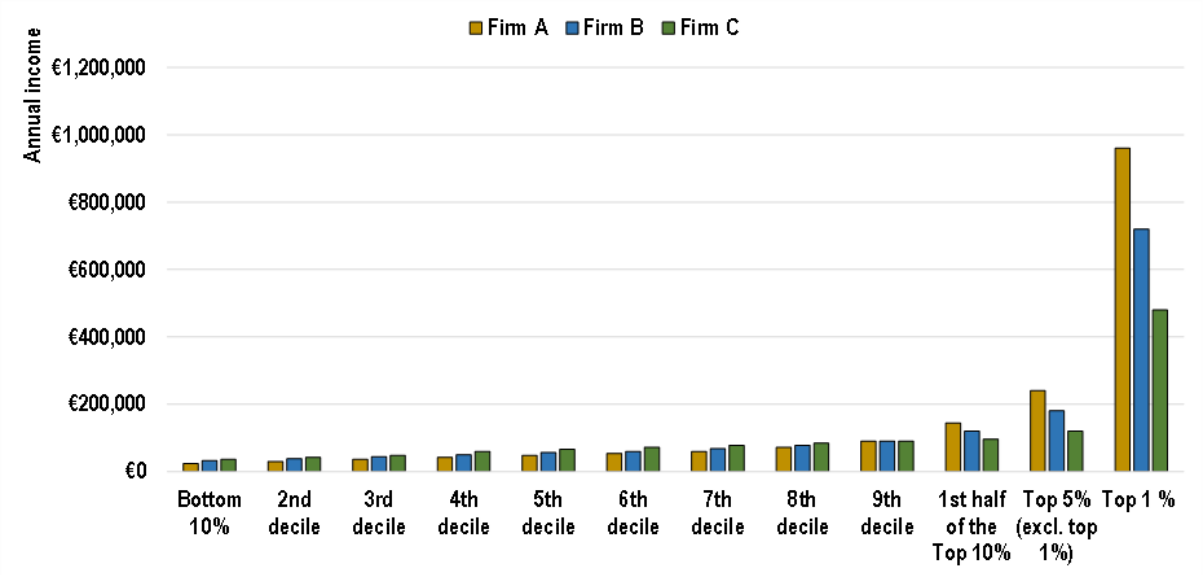
	Firm A	Firm B	Firm C
	Less equal	Moderate	More equal
	The three firms have an identical workforce size and average wages:		
Workers	100	100	100
Total annual wages:	€7,200,000	€7,200,000	€7,200,000
Mean annual wage per worker:	€72,000	€72,000	€72,000
	But they have different wage distributions:		
Bottom 10%	€24,000	€32,000	€36,000
2nd decile	€30,000	€38,000	€42,000
3rd decile	€36,000	€44,000	€48,000
4th decile	€42,000	€50,000	€60,000
5th decile	€48,000	€56,000	€66,000
6th decile	€54,000	€60,000	€72,000
7th decile	€60,000	€68,000	€78,000
8th decile	€72,000	€78,000	€84,000
9th decile	€90,000	€90,000	€90,000
1st half of the Top 10%	€144,000	€120,000	€96,000
Top 5% (excl. top 1%)	€240,000	€180,000	€120,000
Top 1 %	€960,000	€720,000	€480,000
Gini in wages	0.40	0.31	0.22

Note: These are illustrative examples.

6 For reference, in the analysis of the Economic Policy Institute, the ratio between CEO and typical worker's pay stood at 351-to-1 in 2020 (Economic Policy Institute, 2021[35]). While they do not specify the location of the "typical worker" in the distribution, even the workers in the bottom 10% in Firm A's distribution earn "only" 100 times less than the CEO/Top 1% worker in Firm A.

Accordingly, the wage distributions of Firm A, B and C, look as follows:

Figure 2.3. The wage distributions of the three imaginary firms: annual income by decile/percentile



Note: These are illustrative examples.

Box 2.2. How do the wage distributions in the three illustrative firms in this analysis compare to wage inequalities in OECD countries?

Due to the difficulty of sourcing data on firms' wage distributions, the analysis on wage inequality impacts presented in this paper is based on hypothetical examples. The three wage distributions presented in Table 2.4 were chosen to reflect three rather different scenarios, but are intended to be rooted in reality. One real life benchmark comes from (Morais and Kakabadse, 2014[42]), who have previously made the case for the need for a Corporate Gini Index as a better measure of within-firm wage inequalities than common existing metrics on wage distribution, such as the CEO-to-median-worker ratio. In their paper, they estimate the Gini index inside a Portuguese multi-national retail company using the firm's wage distribution data over a time period of four years. The highest Gini coefficient observed inside this company is 0.32, equivalent to the illustrative Firm B in our analysis[7].

Another point of reference for the illustrative wage distributions used in this paper is provided by national earnings inequality figures. Table 2.2 shows three earnings dispersion ratios for the three illustrative firms as well as for the OECD average and the seven countries of the G7. Two factors prohibit a direct comparison between company-level and national earnings inequalities. On one hand, national earnings inequalities reflect both between- as well as within- company inequalities, and OECD estimates suggest that within-firm inequalities account for about one half of the wage dispersion inside countries (OECD, 2021[43]). On the other hand, national earnings dispersion figures do not capture certain types of non-wage compensation, for example in the form of stock options or severance packages, which may bias the comparison in the other direction. Taking these two factors into consideration, it appears likely that the illustrative examples used in the analysis fall within the range of values that may be observed in firms in OECD countries.

Table 2.2. Earnings inequality ratios in the three illustrative firms and in OECD countries

	P90/P10	P90/P50	P50/P10
	Ratio of top to bottom decile	Ratio of top decile to median	Ratio of median to bottom decile
Firm A	**3.8**	**1.9**	**2.0**
Firm B	**2.8**	**1.6**	**1.8**
Firm C	**2.5**	**1.4**	**1.8**
OECD average	**3.3**	**2.1**	**1.6**
Canada	3.2	1.8	1.8
France	3.1	2.1	1.4
Germany	3.3	1.9	1.8
Italy	2.8	1.9	1.5
Japan	2.7	1.8	1.5
United Kingdom	3.2	1.9	1.7
United States	4.8	2.4	2.0

Note: National earnings ratios are for the year 2021, with the exception of France, Germany and the OECD average (2020), and Italy (2019).
Source: *OECD Distribution of Earnings Database*, https://stats.oecd.org/.

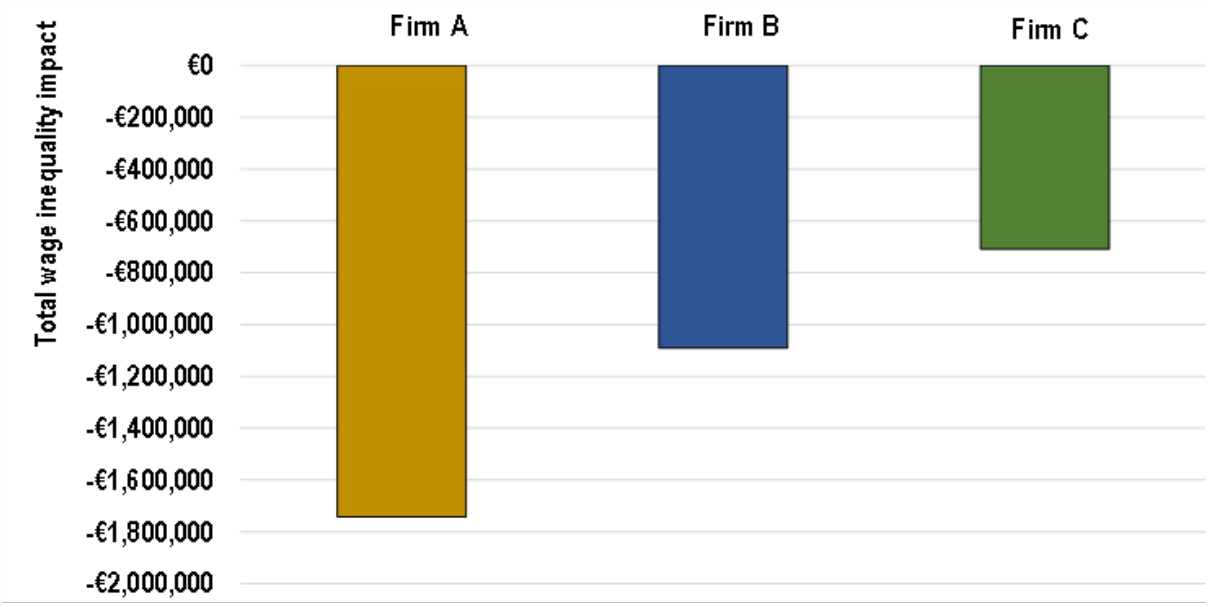
[7] The Corporate Gini Index computed by (Morais and Kakabadse, 2014[42]) is based on employees' total compensation, including benefits and non-wage financial payments. The Gini index observed in the company examined in the paper fluctuated significantly over the four years of analysis (2007-2010), and rose from 0.16 in 2007 to 0.32 in 2010.

Second, it should be noted that, because it focuses on employees as specific category of workers, the resulting wage inequality impact assessment does not cover the full scope of workforce related impacts. The past decades have seen a shift towards the outsourcing of certain (low-skilled) job functions to contract workers or third-party companies who employ workers with sub-standard labour conditions, allowing firms to outsource related liabilities (Weil, 2014[44]). This has given rise to a "grey zone" of workers (OECD, 2019[45]) that are formally self-employed or in contract work and do not receive the full benefits of employment, but that otherwise share the same responsibilities as employees (e.g. they cannot set their rates of pay, have to wear a uniform, or cannot send a replacement to execute tasks). These workers, who are very much still within the direct sphere of influence of the firm and whose work is dependent on the firm, should be included in the computation of the firm's welfare impact calculation. Similarly, if information would allow it, arguments could be made for including (core) supply chain workers in an extended computation of the wage inequality impact in the total workforce.

Using the social welfare function, we compute the representative income $\tilde{y}$ of the worker, which represents the average contribution of income to the social value of the firm, as given by equation (5). The present estimate leaves the possible aversion to inequality effect aside ($\tau = 0$) – implicitly assuming that all workers are equally important within the firm, and so business impact equals the *average* welfare of workers, taking into account the diminishing marginal returns of income to welfare. This is therefore a possible underestimation of the wage inequality impact, as evidence shows that people are averse to inequality and, everything else being equal, they consider low-income and disadvantaged people more important (OECD, 2021[46]).

For firm A, the representative income $\tilde{y}$, which adjusts for the direct impact of inequality, is equal to circa €54,572 when there is no aversion to inequality ($\tau = 0$). The wedge between average income and the representative income, i.e. $€72{,}000 - €54{,}572 = €17{,}428$, represents the negative wage inequality impact, or the welfare loss from giving higher income to workers with lower marginal utility. This entirely stems from the concavity of the utility/welfare function.

Figure 2.4. Total wage inequality impact



Note: This figure shows the total monetised welfare impact associated with wage inequality for the three imaginary firms with wage distributions described above.

The total wage inequality impact amounts to the average impact multiplied by the number of employees, in this case -€1,742,750, which represents 24.2% of Firm A's total spending on wages (Table 2.3 and Figure 2.4). In the case of the other two firms, the respective total wage inequality impacts are -€1,090,618 (Firm B) and -€708,967 (Firm C).

Table 2.3. Total wage inequality impact

	Firm A	Firm B	Firm C
	Less equal	Moderate	More equal
Impact per worker (annual)	-€17,428	-€10,906	-€7,090
Total impact (annual)	-€1,742,750	-€1,090,618	-€708,967
Impact as a % of wage bill	-24.2%	-15.1%	-9.8%

Note: This table shows the monetised welfare impact associated with wage inequality for the three imaginary firms with wage distributions described above.

Using the methodology to assess the impact of implementing a living wage

A number of companies have recently made commitments to implement a living wage, or a wage that allows a worker to meet its basic needs. In June, 2021, the B4IG Coalition welcomed the Call to Action on Living Wage launched by the IDH Sustainable Trade Initiative.[8] While different approaches to calculate a living wage exist, and no full consensus exists on exactly what a living wage is in each country (Balestra, Hirsch and Vaughan-Whitehead, 2023[47]), in principle the methodology presented here today can be applied to measure a company's impact of introducing a living wage among its employees.

To illustrate this, we take an example of a hypothetical firm, this time located in the United Kingdom, with a number of employees earning very low wages, below the real living wage. The Living Wage Foundation has estimated the average real living wage in the United Kingdom in 2022 to amount to £10.90 an hour, which corresponds to £19.200 a year, based on a 37.5-hour workweek and 47 workweeks (Cominetti and Murphy, 2022[48]). We use this living wage estimate to illustrate the impact of its implementation in an illustrative firm. Before the implementation of the living wage, the bottom 10% of workers in the illustrative firm earn a low wage of £12,000 a year, the second decile earn £14,400 and the workers in the third decile earn £16,000. To implement the living wage, the company raises the wages of these groups to £19.200 a year, so that all employees are now at or above the living wage threshold. In this example, the increase is financed by reducing the wages of employees in the top 10% of the distribution only, with the wages of the other workers remaining unchanged (Table 2.4).

[8] B4IG, 2021. "The B4IG Coalition pushes forward Living Wage as a Corporate Priority", https://www.b4ig.org/the-b4ig-coalition-pushes-forward-living-wage-as-a-corporate-priority/.

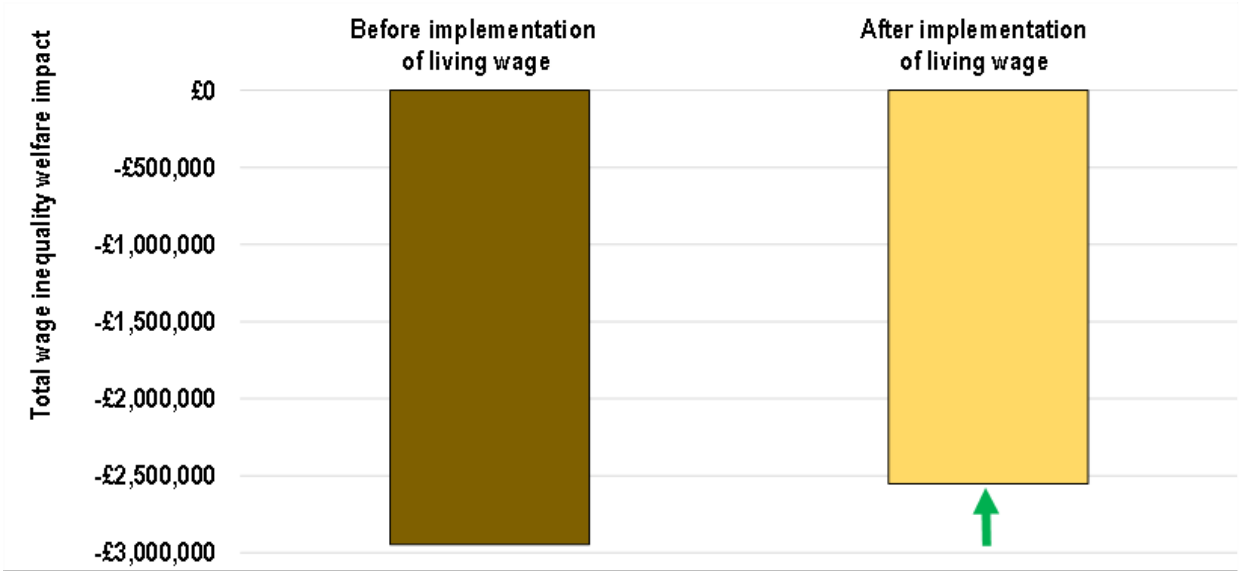
Table 2.4. Illustrative example of the wage distribution of a firm that implements a real living wage

	Bottom 10%	2nd decile	3rd decile	4th decile - 9th decile	1st half of the Top 10%	Top 5% (excl. top 1%)	Top 1 %
Before implementation of living wage	£12,000	£14,000	£16,000	£19,200 £43,800 £66,000 £72,000 £84,000 £90,000 (no changes)	£144,000	£300,000	£1,200,000
After implementation of living wage	**£19,200**	**£19,200**	**£19,200**		**£132,400**	**£278,000**	**£1,100,000**

Note: These are illustrative examples.

In this example, the total wage inequality impact of the firm was -£2,946,413 before the implementation of the living wage. The implementation of the living wage reduces the (negative) welfare impact of wage inequality to -£2,551,875, an improvement of almost £400,000, on a total wage bill of £7.2 million, presenting a significant welfare efficiency gain with respect to the firm's starting point.

Figure 2.5. Change in impact associated with implementation of a living wage in an illustrative firm



Note: This figure shows the total monetised welfare impact associated with wage inequality before and after the implementation of a living wage for the illustrative firm with wage distributions described above.

Assessing wage inequality impact over time and relative to a societal benchmark

To comprehensively assess impacts, the Impact Management Platform[9] recommends measuring changes in outcomes over time and comparing performance against a sustainability threshold. In the area of climate change, sustainability thresholds and targets are set by a combination of science based modelling and political agreements (e.g. the Paris Agreement target of limiting global warming to 1.5°C). So far, the present analysis suggests that any form of inequality is undesirable and has a negative impact on society. Under the assumptions of Atkinson's social welfare function, this is indeed the case. In practice, complete equality is not necessarily desirable (Atkinson, 2015[49]). Wage inequalities to some extent reflect differences in skills, workloads, responsibilities, and work environments, to provide incentives, and to attract and maintain talent. Some presence of inequalities in earnings, therefore, may be expected. Existing levels of wage inequalities are reflective, at least in part, of inequalities in bargaining and wage-setting power, rather than of differences in productivity or skill (OECD, 2021[43]).

There is, however, no internationally accepted threshold for what level of wage inequality is sustainable, or desirable. The SDGs do not feature an absolute income or wealth inequality target, and rather suggest that income growth of the bottom 40 per cent of the population should exceed that of the national average.[10] On average in OECD countries, 80% of people believe that income disparities are too large (OECD, 2021[46]), suggesting that at the very least, current levels are too high, and the present analysis has illustrated that wage inequality is sub-optimal from a welfare perspective. One potential future source of thresholds and targets for within-firm wage inequality levels are company and industry benchmarks. Greater transparency on wage inequalities inside firms would allow companies to benchmark themselves to others and would encourage a race to the top, rather than the bottom, when it comes to wage inequality impacts.

[9] Impact Management Platform, https://impactmanagementplatform.org/.

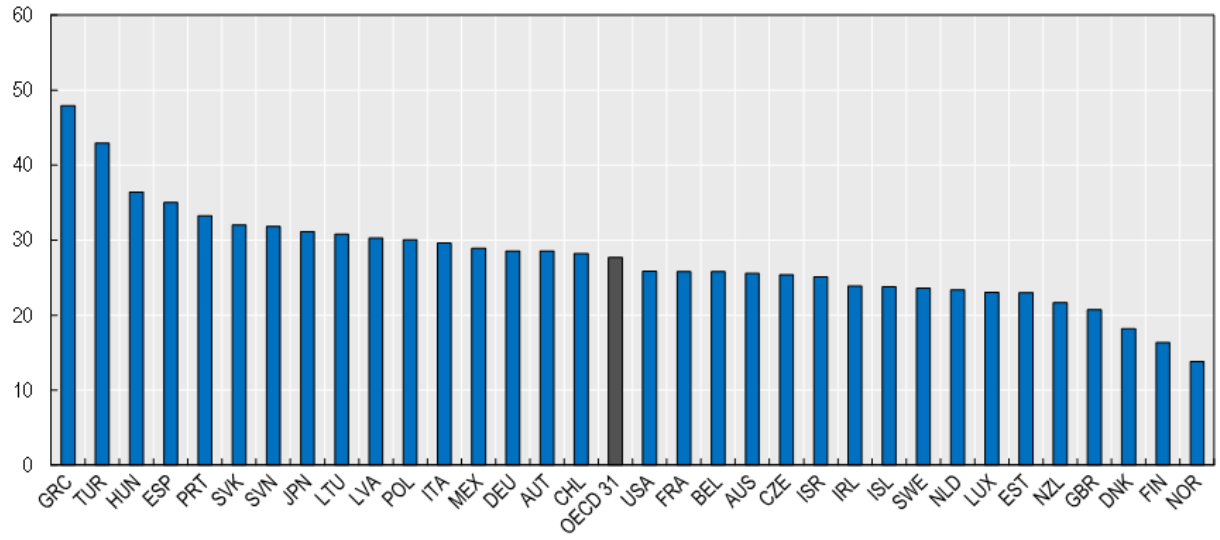
[10] United Nations, Sustainable Development Goals, https://www.un.org/sustainabledevelopment/inequality/.

3. Monetising the impact of employment and working conditions

This section extends the previous methodology by considering two additional well-being outcomes, namely employment status and the quality of the working environment, and by introducing heterogeneity among worker preferences. The methodology presented here is applied at the country level since it requires micro-data on working conditions, a well-being outcome variable (life satisfaction), and household income in order to compute equivalent income, a combination of microdata variables that are not typically available inside firms. Still, it provides useful insights into the potential impacts of employment and working conditions, two channels through which firms affect the lives of workers.

Figure 3.1. Job strain in OECD countries

Share of employees who experienced a number of job demands exceeding that of job resources



Note: The OECD average excludes Canada, Chile, Colombia, Iceland, Korea and Switzerland due to incomplete time series. Data for Korea and Canada refer to 2005 only.
Source: *OECD Job quality* (database), http://stats.oecd.org/Index.aspx?DataSetCode=JOBQ.

Previous studies have underlined the importance of a range of working conditions on workers' subjective levels of satisfaction with the job, and have found that income is an important but not necessarily the most important driver of people's satisfaction with their job (De Neve and Ward, 2017[50]; Murtin et al., 2022[51]). Other key drivers of job satisfaction include the relational component of the workplace and support from management, opportunities for career advancement, workplace voice, discrimination and harassment and working hours and work-life balance. Earnings quality and the

quality of the working environment are two of the three components of the OECD Job Quality Framework[11]. On average in OECD countries, 1 in 3 employees experiences *job strain*[12] (Figure 3.1).

Working conditions and welfare

The theoretical framework for measuring the impact of working conditions (presented in Box 3.1) relies on the idea that the equivalent income of an employee's experience in the working environment can be estimated using a utility function, which allows understanding much income an employee is willing to forego in exchange for good working conditions, keeping the level of welfare and everything else equal. The methodology considers the fact that different people may have different preferences, and computes the average level of equivalent income for each aspect of working conditions considered. This average may differ across countries as a result of these heterogeneous preferences.

Box 3.1. Theoretical framework for measuring the impact of working conditions

Starting with the utility function, instantaneous individual utility is defined as in (Boarini, 2021[13]) as a logarithmic utility function defined over the consumption bundle and environmental factors X and Γ that are both individual and country-specific:

$$u(y_i, X_i) = \alpha \log\left(\frac{y_i}{y_0}\right) + X_i.\Gamma_i; \qquad (7)$$

where *X* is a matrix of observables, Γ a vector of coefficients and y_0 parameterizes the consumption level just above survival for which instantaneous utility is equal to zero, as in the previous section. Again, y_0 is calibrated on the Value of a Statistical Life to reflect the willingness-to-pay for a longer life.

The empirical problem consists in estimating the elasticity parameters (α, Γ_i). The key identifying assumption is that life satisfaction can be viewed as a linear transformation of instantaneous utility:

$$LS(y_i, X_i) = \mu.u(y_i, X_i) + \tau + \theta_i \qquad (8)$$

where θ_i represents an error term with a structure discussed below, and (μ, τ) are two unknown parameters. Combining equations (7) and (8) then yields:

$$LS(y_i, X_i) = \mu.\alpha \log(y_i) + \mu.X_i.\Gamma_i + \tau - \mu.\alpha.\log(y_0) + \theta_i \qquad (9)$$

Equation (9) shows that the life satisfaction regression allows for the identification of the ratio of interest Γ_i/α, but not for the identification of parameter y_0 as τ is unknown. In a sense, the intercept in life satisfaction regressions is not informative, as utility and life satisfaction do not have the same support and normalization. Put differently, a life satisfaction equal to zero does not necessarily correspond to the zero utility describing the state of survival where individuals are indifferent between being alive or dead. Furthermore, coefficient μ does not play any role in the derivation of aggregate welfare which is determined by the ratio of interest Γ_i/α and one can select $\mu = 1$ without loss of generality.

Given estimates $(\hat{\alpha}, \hat{\Gamma}_i)$, and the calibration of y_0, the representative income of the population is equal to

[11] OECD, Job Quality Framework, https://www.oecd.org/statistics/job-quality.htm.

[12] Job strain is computed as the share of employees that experience a number of job demands (e.g. straining physical or emotional circumstances) that is greater than that of job resources (beneficial aspects of the working environment, such as autonomy, self-realisation, and flexibility).

$$\tilde{y} = y_0 . exp\left(\frac{1}{\hat{\alpha}}\left(\frac{1}{n}\sum_i \left(\hat{\alpha}\log\left(\frac{y_i}{y_0}\right) + X_i . \hat{\Gamma}_\iota\right)^{1-\tau}\right)^{\frac{1}{1-\tau}} - \frac{\overline{X_\iota . \hat{\Gamma}_\iota}}{\hat{\alpha}}\right) \quad (10)$$

where $\overline{X_\iota . \hat{\Gamma}_\iota}$ is the population average of environmental factors.

Empirical framework

The vector θ_i comprises country fixed-effects a_j that reflect systemic cross-country cultural (or other time-invariant) differences in the relationship between life satisfaction and individual utility, a period-specific component b_t allowing momentary shifts in the latter relationship, as well as an error term:

$$\theta_{i,j,t} = a_j + b_t + \varepsilon_{i,j,t} \quad (11)$$

In this framework, the set of environmental factors X and Γ include : i) labour-related factors such as the individual employment status and firms' quality of working environment Q_i; ii) individual characteristics Z_i such as age and gender reflecting systemic differences in life satisfaction or utility across population groups; iii) the log of individual household income interacted with individual characteristics W_i including age, gender and income quintile group, reflecting different income preferences across groups, which yields:

$$X_{i,j,t} . \Gamma_i = Q_i . \Phi + Z_i . \Pi + W_i . \Lambda . log\left(y_{i,j,t}\right) \quad (12)$$

As a result, the estimated life satisfaction regression combines equations (9), (11) and (12) and reads as follows:

$$LS_{i,j,t} = a_j + b_t + Q_i . \Phi + Z_i . \Pi + (\alpha + W_i . \Lambda) . log\left(y_{i,j,t}\right) + \varepsilon_{i,j,t} \quad (13)$$

where $\varepsilon_{i,j,t}$ is the residual. Importantly, in all regressions we calculate robust standard errors clustered at the country level.

Applying the framework to monetise the impact of employment and working conditions at the national level

Because the methodology presented in the theoretical framework (Box 3.1) requires microdata on people's experiences of working conditions, their utility (which is proxied by life satisfaction) and their household income, it is difficult with current data availability to apply it to the level of the firm. The present paper therefore provides an illustration at the national level, using data from the European Quality of Life Survey, specifically on four variables, namely being employed, and three aspects of working conditions: perceived job security, perceived tensions with management, and very long working hours.

The effect of being employed and working conditions on life satisfaction is estimated using data from the European Quality of Life Survey that covers the 2003-2016 period. The EQLS covers 28 OECD countries and includes variables on life satisfaction, employment status and equivalised household income, as well as three important aspects of working conditions: the number of weekly working hours, self-reported tensions with management and self-reported perception of job security. Specifically, bad working conditions are captured by the following three dummy variables taking value one if the worker: i) works more than 49 hours per week; ii) reports severe tensions with management; iii) reports high job insecurity (Table 3.1).[13] The indicator of tensions with management is an (imperfect) proxy indicator given that it does not ask respondents about their personal experience of tensions but rather about their perception of society as a whole. This is reflective of the data limitations that prevent accurate and comprehensive impact monetisation.

[13] Include here the exact EQLS questions, its scale, and the coding.

Table 3.1. Description of working conditions variables in EQLS

Variable	Description
Working hours	Respondent works more than 49 hours per week
Tensions with management	Respondent reports a perception of severe tensions between management and workers in the country they live in
Job insecurity	Respondent believes it is very likely they will lose their job in the next 6 months
Unemployment or inactivity	Respondent is unemployed or inactive.

Next, we proceed to estimate the strength of the association between each of the working conditions variables, employment and household income, and life satisfaction, which forms the basis of the equivalent income computation. As was shown in Figure 2.2 in the previous section, the profile of life satisfaction is concave relative to income, implying that the marginal utility from one additional euro is larger for the poor than for the rich. The right panel of the figure tests linear and quadratic fits upon the log of household income. Overall, no significant curvature is observed and as a consequence, a linear fit constitutes a plausible and convenient functional form that reflects the log-income profile of life satisfaction as indicated on Equation (13). Around that average linear fit, life satisfaction is significantly dispersed. Differences in level exist due to cultural differences in the drivers of life satisfaction across countries, and differences in the income gradient may also exist as captured by interaction effects in equation (13).

Table 3.2. Life satisfaction regressions with working conditions factors

European OECD Countries 2003-2016

	(1)	(2)	(3)	(4)	(5)	(6)
Log income	0.935***	0.634***	0.872***	0.603***	1.059***	0.770***
	(0.086)	(0.073)	(0.078)	(0.071)	(0.113)	(0.111)
Working hours > 49			-0.164***	-0.069*	-0.169***	-0.074*
			(0.051)	(0.039)	(0.050)	(0.037)
Tension with management			-0.487***	-0.370***	-0.487***	-0.372***
			(0.065)	(0.046)	(0.064)	(0.046)
Job insecure			-0.618***	-0.567***	-0.618***	-0.568***
			(0.040)	(0.039)	(0.040)	(0.039)
Employed	0.080	0.005	0.199**	0.107**	0.220***	0.111**
	(0.073)	(0.055)	(0.074)	(0.051)	(0.076)	(0.053)
Unemployed	-0.680***	-0.870***	-0.648***	-0.844***	-0.635***	-0.847***
	(0.121)	(0.112)	(0.123)	(0.106)	(0.126)	(0.106)
Disabled	-0.517***	-0.747***	-0.513***	-0.734***	-0.467***	-0.712***
	(0.142)	(0.148)	(0.142)	(0.143)	(0.147)	(0.150)
Retired	0.046	0.026	0.089	0.050	0.131	0.073
	(0.095)	(0.077)	(0.089)	(0.072)	(0.090)	(0.074)
Student	0.770***	0.528***	0.756***	0.532***	0.730***	0.499***
	(0.084)	(0.099)	(0.077)	(0.091)	(0.074)	(0.088)
Chronic illness	-0.344***	-0.489***	-0.317***	-0.455***	-0.308***	-0.447***
	(0.062)	(0.034)	(0.060)	(0.034)	(0.059)	(0.033)
Male	-0.090***	-0.081***	-0.085***	-0.084***	-0.194	0.060
	(0.019)	(0.018)	(0.019)	(0.018)	(0.211)	(0.171)
Age 18-34	0.215*	0.260***	0.237**	0.271***	3.050***	2.534***
	(0.117)	(0.085)	(0.113)	(0.084)	(0.715)	(0.739)
Age 35-54	-0.062	-0.044	-0.050	-0.039	1.007**	0.776*

	(0.064)	(0.052)	(0.063)	(0.052)	(0.397)	(0.440)
Married	0.505***	0.480***	0.503***	0.473***	0.498***	0.468***
	(0.037)	(0.032)	(0.036)	(0.031)	(0.037)	(0.032)
Log income x male					0.016	-0.021
					(0.030)	(0.025)
Log income x age 18-34					-0.409***	-0.329***
					(0.092)	(0.099)
Log income x age 35-54					-0.153***	-0.117*
					(0.052)	(0.059)
constant	0.350	3.374***	0.884	3.548***	-0.429	2.390***
	(0.583)	(0.519)	(0.519)	(0.496)	(0.754)	(0.763)
Country and time dummies	No	Yes	No	Yes	No	Yes
R2	0.141	0.194	0.159	0.206	0.161	0.207
N	4.7e+04	4.7e+04	4.7e+04	4.7e+04	4.7e+04	4.7e+04

Note: Standard errors in parentheses. * p < 0.10; ** p < 0.05; *** p < 0.01
Source: OECD calculations using data from the European Quality of Life Survey.

Table 3.2 displays the results from the estimation of equation (13), using a sample of the working-age population (15-64). The income elasticity of life satisfaction ranges between 0.60 and 1.06 and always displays a strong statistical significance. In columns (3) to (6), being employed has a significant positive association with life satisfaction. With a relative elasticity of 0.11/0.77 = 0.14 as in column (6), being employed displays a positive welfare potential impact that is equivalent to an increase in income by 13%.[14] Columns (3) to (6) also include the three working condition dummy variables, which are all negatively signed and are statistically significant. At the individual level, working more than 49 hours per week, perceived tension between management and workers and reporting high job insecurity are associated with a welfare-equivalent income loss of 9%, 38% and 52%, respectively.

The findings also confirm some insights made in previous life satisfaction studies, e.g. (Boarini, 2021[13]). Being unemployed and being unable to work due to disability implies a large welfare loss relative to inactivity, while students enjoy a significant welfare premium. The interaction of log income with individual characteristics points at a lower income elasticity for young and prime-age adults relatively to the elderly, while healthy people, young people as well as married people are also significantly happier than counterpart groups (columns 1-6).

Business impact as the welfare value of employment and working conditions

The framework and the results presented in Table 3.2 are used to calculate the monetary equivalent of becoming employed or getting rid of bad working conditions. This monetisation is achieved via the following equation:

$$\hat{u}(y_i, X_i) = \hat{u}(y_i - \delta_i, X^*)$$

where $\hat{u}$ is the utility function estimated via equation (13) and described in Table 3.2 Column (6); X_i is the initial situation of individual *i*, X^* is the reference situation being valued (i.e. being employed rather than unemployed or inactive, facing no bad working condition) and δ_i is the willingness-to-pay of individual *i* to move from initial to reference situations. Obviously, $\delta_i = 0$ for individuals initially employed and for those initially facing no bad working condition. In this counter-factual assessment, students, disabled and retired people's labour force status is kept unchanged, as their transition to employment is excluded. The resulting estimated impact represents the monetised social welfare that is lost associated with unemployment or inactivity and the three forms of poor working conditions described

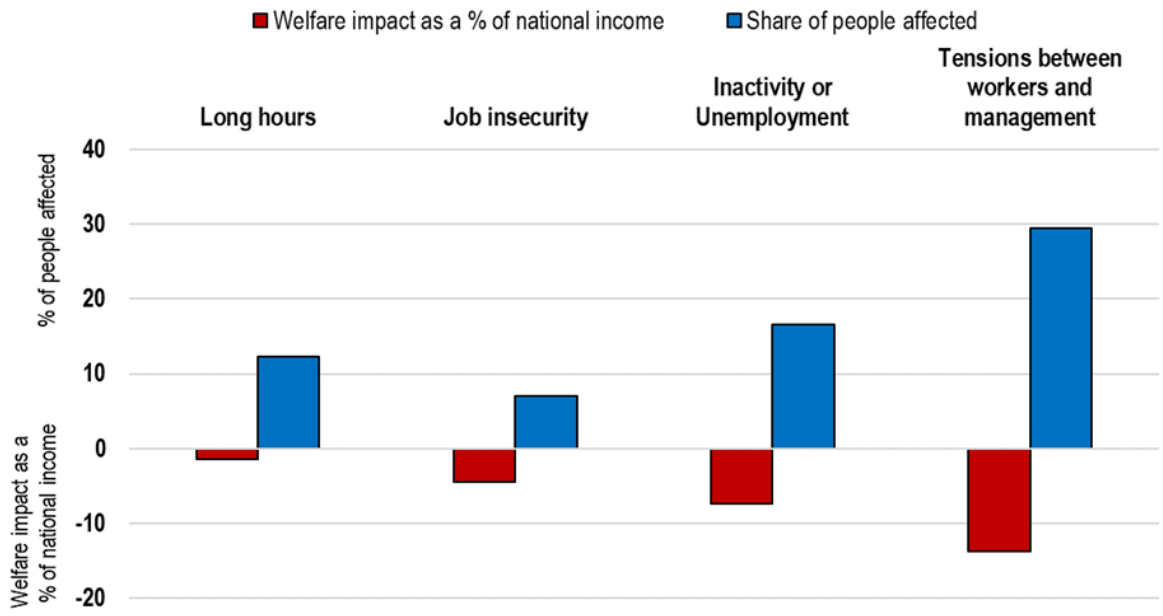
[14] The exact formula is 1-exp(-b/a) where b is the dummy coefficient and a the coefficient on log income.

above. The following results are expressed in terms of the total welfare gains or losses as a share of national income, which takes into account both the effect size as well as the number of people affected.

At the aggregate, in the sample of 28 European OECD countries, excess working hours (> 49 hours per week) is associated with a welfare equivalent of 1.5% of national income. Perceived job security is associated with a welfare loss of 4.5% of national income, and perceived tensions with management is equivalent to a massive 13.9%. This results from a combination of a large effect size and a high number of people perceiving tensions. The welfare impact of tensions with management could be an overestimate owing from the imprecise nature of the proxy variable, which is not phrased specifically in relation to the respondent's own experience. Finally, the welfare impact of unemployment or inactivity amounts to 7.4% of national income. This is largely representative of the significant negative welfare impacts associated with unemployment, which have been thoroughly documented.

As noted, these quantities compound two effects, namely the shadow price of the treatment (as described above), and the share of population being treated. This is also reported in Figure 3.2. As 30% of individuals in the sample report tension with management and the latter displays a high shadow price, tension with management has the highest negative welfare impact. Employment comes in second rank, as it involves a large treated population (i.e. 37% of the sample) but at a lower shadow price.

Figure 3.2. Impact of unemployment or inactivity and bad working conditions



Source: OECD calculations using data from the European Quality of Life Survey.

Overall, this section has highlighted four sources of possible positive and negative welfare impacts by businesses: employment (a possible positive impact) and working conditions, which have the potential to represent a negative impact. The total welfare value that can be reaped through these four channels represents as much as 25% of national income (i.e. one or two decades of economic growth depending on the country). These results confirm the existence of potentially large business impacts on social welfare. As emphasised, it is important to clearly acknowledge the assumptions and limitations these results rely on, which underline that the results from this methodology should be appropriately contextualised and used with caution (Box 3.2).

Box 3.2. Limitations and assumptions of the present methodology

Impact monetisation methodologies should clearly convey their assumptions and limitations. In the methodology presented here, the following should be kept in mind:

- All valuation methodologies rooted in utility functions are rested on the assumption that subjective well-being (life satisfaction) is a direct measure of individual welfare. This is a commonly held assumption, yet there are reasons why subjective well-being may be considered an imperfect measure of utility, and in addition, life satisfaction is not the only possible measure of subjective well-being, with alternative candidates being positive and negative affect and eudaimonia.
- A possible source of uncertainty in subjective well-being monetisation methodologies is the potential for overvaluing welfare values associated with an undervaluation of the income coefficient, potentially resulting endogeneity, and/or overestimation (Fujiwara and Campbell, 2011). While in the present paper, few possible sources of overestimation exist, there are many possible confounding factors that may introduce bias into the estimation that are hard to control for.
- Measurement error and data quality are also possible limitations. Specifically, the present methodology relies on accurate reports of household income. In addition, the variable used on perceived tensions between management and workers does not capture the respondent's own experience with management.

4. Conclusion

This paper is an attempt to take another step forward in the direction of robust monetisation methodologies that firms can use to communicate their impacts on people, in this case, specifically, employees. The paper shows that business impacts can be significant. Even a firm with an internal wage inequality Gini index equivalent to roughly that of Slovenia's, one of the most equal countries in the OECD, still has a negative wage inequality impact of about 10% the size of its wage expenditure. Firms with more unequal wage distributions, which likely exist, especially when taking into account the supply chain, will have significantly larger wage inequality related footprints. Implementing a living wage is one way firms can reduce their wage inequality impacts, but as this paper has shown, the entire distribution of wages matter for addressing wage inequality impacts.

Similarly, in the area of working conditions, the impact of negative working conditions is significant, and amounts to up to 25% of national household income, which implies that many firms in the economy will have substantial negative impacts. Specifically, the negative impact of excess working hours (> 49 hours per week) is estimated to be equivalent to 1.5% of national income, with 4.5% for job security, 13.9% for tensions between management and workers, and 7.4% for unemployment or inactivity. Improving working conditions by improving working hours, reducing tensions between workers and management, and addressing job insecurity are ways in which firms can reduce negative impacts. Helping people out of unemployment or inactivity into employment also has a positive impact.

This paper provides its own contribution to the growing body of work aimed to monetise business social impacts. It expands on existing work by introducing a methodology for monetising wage inequality impacts rooted in welfare economics, and by adding into the view three additional components of working conditions. As such, it represents a small step at the beginning of a long journey to make the valuation and monetisation of business social impacts useful for decision-making processes.

Advancing this work depends partially on the availability of data. First of all, implementing the two methodologies presented here inside existing firms requires data on company wage distributions and working conditions. Second, improving the welfare values in Section 3, with more specific variables and a wider range of working conditions, would necessitate a richer dataset with a larger range of working conditions, ideally in the company setting.

Despite data limitations, the findings of this paper can be used to inform decision-making policies to improve business social sustainability impacts. Wage inequality is a significant detractor of social welfare and unequal wage distributions are accordingly associated with a negative impact. Reducing wage inequalities, which have risen in many countries, is an important way in which companies can reduce their negative social impacts. Improving working conditions, while seemingly less tangible, similarly implies positive gains representing significant amounts of national income.

References

Atkinson, A. (1970), "On the Measurement of Inequality", *Journal of Economic Theory*, Vol. 2/3, pp. 244-263. [36]

Atkinson, T. (2015), "What can be done about inequality?", *Juncture*, Vol. 22/1, pp. 32-41, https://doi.org/10.1111/j.2050-5876.2015.00834.x. [49]

Balestra, C., D. Hirsch and D. Vaughan-Whitehead (2023), "Living wages in context: A comparative analysis for OECD countries", *OECD Papers on Well-being and Inequalities*, No. 13, OECD Publishing, Paris, https://doi.org/10.1787/2e622174-en. [47]

Barby, C. et al. (2021), *Measuring Purpose – An Integrated Framework*, https://enactingpurpose.org/assets/measuring-purpose---an-integrated-framework.pdf. [24]

Becker, G. (2005), "The Quantity and Quality of Life and the Evolution of World Inequality", *American Economic Review*, Vol. 95/1, pp. 277-291. [8]

Boarini, R. (2021), "Well-being during the Great Recession: new evidence from a measure of multi-dimensional living standards with heterogeneous preferences", *Scandinavian Journal of Economics*, https://doi.org/10.1111/sjoe.12461. [13]

Capitals Coalition (2022), *A navigation through value accounting methods*, https://capitalscoalition.org/publication/a-navigation-through-value-accounting-methods/. [3]

Cazes, S., A. Hijzen and A. Saint-Martin (2015), "Measuring and Assessing Job Quality: The OECD Job Quality Framework", *OECD Social, Employment and Migration Working Papers*, No. 174, OECD Publishing, Paris, https://doi.org/10.1787/5jrp02kjw1mr-en. [15]

Cominetti, N. and L. Murphy (2022), *Calculating the Real Living Wage for London and the rest of the UK: 2022*, https://www.resolutionfoundation.org/app/uploads/2022/09/Calculating-the-real-living-wage-2022.pdf. [48]

De Neve, J. and G. Ward (2017), *Happiness at Work*, Sustainable Development Solutions Network, https://s3.amazonaws.com/happiness-report/2017/HR17-Ch6_wAppendix.pdf. [50]

Deaton, A. (1980), *Economics and Consumer Behaviour*, Cambridge University Press. [52]

Decancq, K. (2016), "Beyond GDP: Using equivalent incomes to measure well-being in Europe", *Social Indicators Research*, Vol. 126/1, pp. 21-55. [21]

Decancq, K. (2015), "Happiness, Equivalent Incomes, and Respect for Individual Preferences", *Economica*, Vol. 82, pp. 1082-1106. [22]

Dockins, C. (2004), *Value of Statistical Life Analysis and Environmental Policy: A White Paper*. [53]

Economic Policy Institute (2021), *CEO pay has skyrocketed 1,322% since 1978*, https://www.epi.org/publication/ceo-pay-in-2020/. [35]

Edmans, A. (2011), "Does the stock market fully value intangibles? Employee satisfaction and equity prices", *Journal of Financial Economics*, Vol. 101/3, pp. 621-640, https://doi.org/10.1016/j.jfineco.2011.03.021. [26]

Fadhel, A. et al. (2021), "Accounting for Employment Impact at Scale", *Harvard Business* [30]

School Working Paper 22-018, https://www.hbs.edu/impact-weighted-accounts/Documents/Accounting-Employment-Impact-Scale-2021.pdf.

Ferrer-i-Carbonell, A. and B. van Praag (2002), "The subjective costs of health losses due to chronic diseases. An alternative model for monetary appraisal", *Health Economics*, Vol. 11/8, pp. 709-722, https://doi.org/10.1002/hec.696. [18]

Fleurbaey, M. (2013), *Beyond GDP: Measuring Welfare and Assessing Sustainability*, Oxford University Press. [9]

Fleurbaey, M. (2009), "International Comparisons of Living Standards by Equivalent Incomes", *Scandinavian Journal of Economics*, Vol. 111/3, pp. 529-624. [20]

Fornell, C., F. Morgeson and G. Hult (2016), "Stock Returns on Customer Satisfaction Do Beat the Market: Gauging the Effect of a Marketing Intangible", *Journal of Marketing*, Vol. 80/5, pp. 92-107, https://doi.org/10.1509/jm.15.0229. [25]

Freiberg, D. (2021), "Accounting for Organizational Employment Impact", *Harvard Business School working paper*, Vol. 21-050. [29]

Frey, B., S. Luechinger and A. Stutzer (2004), "Valuing public goods: The life satisfaction approach", *Institute for Empirical Research in Economics University of Zurich Working Paper Series*, Vol. 184, http://www.econ.uzh.ch/static/wp_iew/iewwp184.pdf. [17]

G7 Impact Taskforce (2021), *Time to deliver: mobilising private capital at scale for people and planet*, https://www.impact-taskforce.com/media/gq5j445w/time-to-deliver-final.pdf. [14]

HBS Impact Weighted Accounts et al. (2021), *The Case of Monetary Valuation*, https://www.hbs.edu/impact-weighted-accounts/Documents/The%20Case%20of%20Monetary-Valuation.pdf?csf=1&web=1&e=GaESlP. [2]

Jebb, A. et al. (2018), "Happiness, income satiation and turning points around the world", *Nature Human Behaviour*, Vol. 2/1, pp. 33-38, https://doi.org/10.1038/s41562-017-0277-0. [37]

Jenkins, S. (1997), "Trends in real income in Britain: a microeconomic analysis", *Empirical Economics*, Vol. 22, pp. 483-500. [10]

Jenkins, S. (1995), "Accounting for inequality trends: decomposition analyses for the UK, 1971-86", *Economica*, Vol. 62, pp. 29-63. [41]

Jones, C. (2016), "Beyond GDP: Welfare across Countries and Time", *American Economic Review*, Vol. 106/9, pp. 2426-57. [11]

Kahneman, D. and A. Deaton (2010), "High income improves evaluation of life but not emotional well-being", *Proceedings of the National Academy of Sciences*, Vol. 107/38, pp. 16489-16493, https://doi.org/10.1073/pnas.1011492107. [38]

Killingsworth, M. (2021), "Experienced well-being rises with income, even above $75,000 per year", *Proceedings of the National Academy of Sciences*, Vol. 118/4, https://doi.org/10.1073/pnas.2016976118. [39]

King, A. (2021), "Heroic Accounting", *Stanford Social Innovation Review*, https://doi.org/10.48558/Z07V-B179. [5]

Krekel, C., G. Ward and J. DeNeve (2019), *Employee Well-being, Productivity, and Firm Performance: Evidence and Case Studies*, Sustainable Development Solutions Network, https://s3.amazonaws.com/ghwbpr-2019/UAE/GH19_Ch5.pdf. [27]

Morais, F. and N. Kakabadse (2014), "The Corporate Gini Index (CGI) determinants and advantages: Lessons from a multinational retail company case study", *International Journal of Disclosure and Governance*, Vol. 11/4, pp. 380-397, https://doi.org/10.1057/jdg.2014.4. [42]

Murtin, F. (2017), "Beyond GDP: Is there a law of one shadow price?", *European Economic Review*, Vol. 100/C, pp. 390-411. [12]

Murtin, F. et al. (2022), "The relationship between quality of the working environment, workers' health and well-being : Evidence from 28 OECD countries", *OECD Papers on Well-being and Inequalities*, No. 04, OECD Publishing, Paris, https://doi.org/10.1787/c3be1162-en. [51]

Nordhaus, W. (1973), *Is Growth Obsolete?*, National Bureau of Economic Research. [7]

Nordhaus, W., H. Houthakker and R. Solow (1973), "The Allocation of Energy Resources", *Brookings Papers on Economic Activity*, Vol. 1973/3, p. 529, https://doi.org/10.2307/2534202. [16]

OECD (2022), *Income Inequality Database*, https://data.oecd.org/inequality/income-inequality.htm. [33]

OECD (2021), *Does Inequality Matter? : How People Perceive Economic Disparities and Social Mobility*, OECD Publishing, Paris, https://doi.org/10.1787/3023ed40-en. [46]

OECD (2021), *The Role of Firms in Wage Inequality: Policy Lessons from a Large Scale Cross-Country Study*, OECD Publishing, Paris, https://doi.org/10.1787/7d9b2208-en. [43]

OECD (2019), *OECD Employment Outlook 2019: The Future of Work*, OECD Publishing, Paris, https://doi.org/10.1787/9ee00155-en. [45]

OECD (2019), *Under Pressure: The Squeezed Middle Class*, OECD Publishing, Paris, https://doi.org/10.1787/689afed1-en. [34]

OECD (2018), "Subjective well-being valuation", in *Cost-Benefit Analysis and the Environment: Further Developments and Policy Use*, OECD Publishing, Paris, https://doi.org/10.1787/9789264085169-10-en. [19]

Samuelson, P. (1974), "Complementarity: An Essay on the 40th Anniversary of the Hicks-Allen Revolution in Demand Theory", *Journal of Economic Literature*, Vol. 12/4, pp. 1255-1289. [6]

Sen, A., J. Stiglitz and J. Fitoussi (2009), "Report by the Commission on the Measurement of Economic Performance and Social Progress". [31]

Serafeim, G. (2019), *Impact-weighted Financial Accounts: The Missing Piece for an Impact Economy*, https://www.hbs.edu/impact-weighted-accounts/Documents/Impact-Weighted-Accounts-Report-2019_preview.pdf. [1]

Siegerink, V., M. Shinwell and Z. Zarnic (2022), "Measuring the non-financial performance of firms through the lens of the OECD Well-being Framework", *OECD Papers on Well-being and Inequalities* 3, https://doi.org/10.1787/28850c7f-en. [4]

Thoma, J. (2021), "Weighing the Costs and Benefits of Public Policy: On the Dangers of Single [32]

Metric Accounting", *LSE Public Policy Review*, Vol. 2/2, p. 4, http://doi.org/10.31389/lseppr.47.

VBA (2021), *Methodology Impact Statement: General Paper*, https://www.value-balancing.com/en/downloads.html. [28]

VBA, IWAI, SVI, and other organisations (2021), *The Case of Monetary Valuation*, https://www.value-balancing.com/_Resources/Persistent/f/2/f/e/f2fe0928f157bfe7a467ad3d7eb7379b5aa56c5b/The%20Case%20of%20Monetary-Valuation.pdf. [23]

Wang, H., Z. Cheng and R. Smyth (2017), "Consumption and Happiness", *The Journal of Development Studies*, Vol. 55/1, pp. 120-136, https://doi.org/10.1080/00220388.2017.1371294. [40]

Weil, D. (2014), *The Fissured Workplace*, Harvard University Press, https://doi.org/10.4159/9780674726123. [44]