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A Multidimensional Approach to Measuring Quality of Employment (QoE) Deprivation in Six Central American Countries

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Abstract
This paper proposes a methodology for measuring Quality of Employment (QoE) deprivation from a multidimensional perspective in six Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama) using a dataset specifically designed to measure employment conditions. Building on previous work on multidimensional poverty and employment indicators, the paper uses the Alkire/Foster (AF) method to construct a synthetic indicator of the QoE *at an individual level.* It selects four dimensions that must be considered as essential to QoE deprivation: income, job stability, job security and employment conditions. These dimensions then subdivide into several indicators, a threshold for each indicator and dimension is established before defining an overall cut-off line that allows for the calculation of composite levels of deprivation. The results generated by this indicator show that Central American countries can be divided into three distinct and robust performance groups in terms of their QoE deprivation. Overall, approximately 60% of the deprivation levels are attributable to non-income variables, such as occupational status and job tenure. The methodology used can allow policymakers to identify and focus on the most vulnerable workers in a labour market and highlights the fact that having a formal written contract is no guarantee of good job quality, particularly in the case of women.

Keywords Multidimensional indicators research · Labour markets · Employment · Job quality · Latin America · Central America

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1 Introduction

In recent decades, the social indicators research literature on labour markets in developed countries has devoted increasing attention to the concept of job quality, interchangeably also referred to as decent work or the quality of employment (QoE).[1] In developing countries, however, research on this issue is incipient. This article aims to contribute to this emerging literature by proposing a measure of QoE deprivation in Central America. It uses the Alkire/Foster method for measuring multidimensional poverty (Alkire & Foster, 2011) to define such an index and presents initial results that show how Central American countries can be categorised into three groups of very poor, poor and reasonable overall job quality that are relatively consistent with their level of development. Disaggregated results allow us to pinpoint important differences between countries and to examine in more detail which workers are most deprived in terms of their QoE. The article concludes by showing how a QoE index can be used by policy makers.

Such an index is part of the more general reflection on measuring well-being and sustainable development. In particular, it contributes to measuring SDG 8a ("full and productive employment and decent work for all").[2] In addition, it connects with the so-called "Beyond GDP" debate that focuses on developing indices that are more inclusive of environmental and social aspects of development than GDP is.[3]

This article follows the path forged by Alkire et al. (2015) in measuring multidimensional poverty. Academics and experts therefore now generally agree that measuring poverty using only income thresholds does not always provide a good indicator of whether households are able "to achieve minimum thresholds in a variety of dimensions such as nutrition, clothing and housing" (Alkire & Santos, 2013, p. 239). Multidimensional measures of poverty therefore consider indicators of health, education, housing conditions and other dimensions and are now being used in addition to traditional income based poverty measures (UNDP, 2019; World Bank, 2016).

Like poverty, the Quality of Employment (QoE) is also a multidimensional concept (Alaimo et al., 2020): simply having a job is not necessarily enough to achieve minimum levels of functionings in dimensions related to the wellbeing of a worker and any dependents in the same household. Aspects such as whether a job pays well, whether it is stable and safe, and whether a worker's rights are protected are equally important (Sehnbruch, 2006; ILO, 2017; OECD, 2014; IADB, 2017). It is these aspects of employment that make the concept multidimensional. This was recognised by Alkire (2007) and Lugo (2007) when they referred to employment as being one of the missing dimensions of poverty.[4]

However, while the academic and institutional literature has made significant progress in measuring multidimensional poverty across countries (Alkire & Jahan, 2018; Battiston et al., 2013), progress on measuring job quality has been more mixed.[5]Although the subject has attracted increased attention from both the academic and policy-making literature,

[1] Burchell et al. 2014 review this literature in detail.

[2] See United Nations 2015.

[3] See for example Bleys 2012; Boarini et al. 2013 and D'Urso et al. 2020.

[4] Both Alkire and Lugo cite Sen's work on employment (Sen, 1975), but also recognise that he has considered the contribution of employment in the development of individual capabilities implicitly rather than explicitly (e.g. Sen 1984 and 1997).

[5] Burchell et al., 2014 provide a comprehensive overview of the academic job quality literature. In this literature, expressions such as 'decent work', 'quality of working life', 'job quality' or 'quality of work' and finally 'quality of employment' are often used interchangeably without precise definitions, which further complicates the conceptualisation of what these concepts mean in practice.

which recognises employment as a multi-dimensional phenomenon, no consensus has as yet been achieved on how the concept should be measured. Thus, multidimensional indicators of deprivation in terms of job quality are not being used for targeting public policies (such as job or vocational training subsidies) at vulnerable households in the same way as is being done with indicators of multidimensional poverty.[6]

Both the ILO and the EU have struggled to put forward effective measures of "decent work" that can inform and guide policymakers in their constituent countries. Burchell et al. (2014) show that these institutions have to reconcile the often contradictory interests of their stakeholders (governments, employers and unions) on this subject, which has led to definitions of decent work that are impracticable because they include too many variables for which data is not always available.[7] Generally, these measures include multiple perspectives, such as macro indicators (e.g. unemployment and participation rates) and micro indicators (e.g. salaries, types of contracts or individual health and safety conditions) as well as other variables that different social actors care about, such as productivity or rights to collective bargaining and organisation.[8]These measures also often include both subjective and objective indicators of employment conditions, which do not take into account the adaptive preferences of workers (Sen, 1992, 1999). Overall, this plethora of multiple perspectives has limited the impact of the concept of decent work, which to date lacks useful operationalisation.

Independent and academic efforts to measure job quality by academic researchers have been more successful. As successive waves of the European Working Conditions Survey (EWCS) have been made available, researchers have used this data to construct dashboard indicators, which provide useful input for the public policy debate.[9] Similarly, the job quality index put forward by the OECD in 2014 constitutes significant progress: it includes three dimensions (earnings, labour market security and the quality of the working environment), and thus captures the essence of the job quality literature. However, the OECD presents these dimensions as a dashboard of indicators rather than a synthetic indicator, which makes its results difficult to summarise across countries and restrict its usefulness to policymakers, who would not be able to examine the joint distribution of indicators across the workforce, and thus identify the most vulnerable workers.

In developing countries, by contrast, data availability is limited, which makes it difficult to replicate conceptualisations and measures of job quality that were developed for industrialised countries. Even the limited data required by the OECD's job quality index is not available in less developed countries so that several variables within the index would have to be replaced with proxies (OECD, 2015). Adapting measures of the quality of employment suitable to developing countries, therefore, must consider not only data limitations but also differing local regulatory frameworks, a culture of informality and regulatory

[6] See for example Azevedo and Robles (2013), Alkire and Seth (2013), and Alkire et al. (2018).

[7] For a further discussion, see also, Sehnbruch et al. (2015) and Piasna et al. (2019) provide detailed accounts of the attempts made by the ILO and EU to measure decent work.Royuela et al. (2008) provide a similarly useful account of the indicators considered for the case of the European Commission.

[8] Ibid.

[9] Muñoz de Bustillo et al. (2009) provide a comprehensive overview of this research. But see in particular Green and Mostafa (2012) and Leschke and Watt (2014).

incompliance (Cárdenas et al., 2102; Posso, 2010). These challenges partly explain why the institutional initiatives taken by the ILO and the EU to conceptualise decent work have not been taken up by policymakers in developing countries, where cross country overview studies of employment or labour markets still rely on basic data such as unemployment and participation rates or informal or vulnerable employment as the main indicators of labour market performance.[10]

So far, mainly single country academic studies have used the idea of constructing a multidimensional index of job quality.[11]More recently though, the IDB (2017) presented the "Better Jobs Index" of employment conditions in Latin America. The report combines indicators of the quantity of employment (participation and employment rates) with indicators of their quality (formality and earning a living wage). This index constitutes significant progress in the Latin American context because it is the first synthetic measure of job quality that has been put forward by an international development institution. However, this index is based on only the most basic variables and uses macro-level data, which cannot be disaggregated. This limits its usefulness to policymakers, who cannot use this index for targeting social policies and subsidies. In 2018,Soffia constructed a dashboard of indicators across Central American countries, which incorporates a more extensive range of variables and is calculated at the level of individual workers.[12]But as Leschke and Watt (2014) have pointed out when referring to their own work on job quality in Europe, dashboard indicators have the limitation that they are not useful to policymakers (2014, p. 2).

More recently, Sehnbruch et al. (2020) calculated a synthetic multidimensional indicator of the QoE using data from household surveys in nine Latin American countries. While this paper undoubtedly constitutes progress in the sense that it brings together variables on individual workers from three dimensions (income, job stability and working conditions) so that it can usefully inform policy-making, the QoE index presented in this paper is limited by the availability of comparable data on working conditions in the countries studied. Hence, what distinguishes this paper is that it uses data from a survey applied in six Central American countries that was specifically designed to study employment conditions.

This paper therefore takes the analysis proposed by Sehnbruch et al. (2020) one step further by incorporating a more detailed dimension of working conditions in the QoE Index proposed. To do so it uses data from the *Encuesta Centroamericana sobre Condiciones de Trabajo y Salud* (Central American Health and Working Conditions Survey, or ECCTS from its Spanish acronym). This survey, applied in 2011, includes detailed questions on employment conditions in six Central American countries (see detail below).

The methodology proposed by this paper thus considers four dimensions in measuring the concept of QoE deprivation in the region: labour income, employment stability, employment security, and employment conditions. The index thus follows the methodology

[10] See for example UNDP's (2015), which included the following variables in its statistical annex: employment rates, labour force participation, unemployment rates, youth not in school or employment, output per worker and hours worked per week. Similarly, ILO (2017, 2018) reports use labour force participation rate, employment rates, unemployment rates, rate of labour underutilization, working poverty rates, wage and salaried employment, and occupational status (self-employed or wage-earners).

[11] See Sehnbruch (2006) and Huneeus (2012) on Chile; Huneeus et al. (2015) on Brazil; Villacís and Reis (2016) on Ecuador; Ortega (2013) on Mexico; Gómez-Salcedo et al. (2017) on Colombia. The only notable exceptions are Soffia(2018) on Central America, and IBD (2017)and Sehnbruch et al. (2020) on Latin America.

[12] This study uses the same dataset as is used by this paper; the Survey of Central American Employment and Health Conditions.

Table 1 Basic Characteristics of Countries selected for this Study (2011)

Countries	Population	Annual GDP (US$)	Minimum wage (Real US$)	Poverty (%)	Unemployment rate (%)	Vulnerable employment (%)
Costa rica	46,11,686	42,262.70	107.2	19.4	7.7	18.8
El salvador	61,97,014	20,283.80	100.8	48	6.6	38.7
Guatemala	1,46,54,566	47,654.70	130.7	50.5	3.1	40.7
Honduras	82,52,118	17,730.90	212.9	56.7	6.8	41.6
Nicaragua	58,09,850	9,774.30	182.9	46.3	8.1	43.3
Panamá	36,81,686	33,715.50	107	23.1	3.6	29

Data availability on poverty for Guatemala and Nicaragua refers to 2014; for El Salvador refers to 2012. Vulnerable employment is contributing family workers and own-account workers as a percentage of total employment

of Alkire and Foster's (2011) Multidimensional Poverty Index to put forward a synthetic measure of the QoE deprivation, which takes into account the risks generated by poor employment conditions.

However, the six Central American countries included in this study were not only selected due to data availability but also because they represent diverse states of development within the broad range of developing countries with GDP per capita levels ranging from around USD 2,000 (Nicaragua and Honduras) to levels approaching USD 10,000 in Costa Rica and Panama (see Table 1). Employment, unemployment and vulnerable employment rates also vary significantly between countries. Moreover, although the countries have different levels of institutional functioning, they do have similar labour codes and regulatory structures.[13]

This paper proceeds as follows: following this much abbreviated review of the existing literature on the QoE, it discusses the dataset used in this paper in the following section before presenting the methodology for measuring QoE deprivation in six Central American countries by means of a synthetic index based on the Alkire/Foster (2011) method. The results of this index are then analysed to highlight the contribution that the indicator can make to the discussion of labour markets in developing countries. In particular, the contribution that particular dimensions and indicators included in this index make to its overall results are analysed, as well as the overall distribution of QoE deprivation, in particular as it relates to urban and rural workers as well as to men and women. The paper concludes by presenting further challenges related to this research.

The contribution of this paper to the existing research is threefold: First, it demonstrates that QoE deprivation can be usefully measured by means of a synthetic index using the Alkire/Foster method. Second, it shows that this index can be used by policymakers for targeting policy support and employment-related benefits at the most vulnerable workers in the labour market, many of whom are deprived in more than one dimension or indicator. Third, this paper also highlights the need for generating better and more homogenous data on employment conditions in developing countries as the results of this paper, however useful, cannot be replicated across a broader range of developing countries unless its methodology is simplified.

[13] This paragraph is based on Soffia (2018) and data from CEPALSTAT, 2011.

2 Methods

Building on the Foster-Greer-Thorbecke poverty measures, Alkire and Foster (2011) propose to measure multidimensional poverty using a dual cut-off approach. This methodology has captured the attention of academia and policymakers alike from around the world, and several countries in Latin America have implemented official poverty measures based on this method.[14] The technique has also been extended to other subjects such as child poverty (Hoolda Kim, 2019; Leturcq & Panico, 2019), energy poverty (Ozughalu & Ogwumike, 2019), women's empowerment (Galiè et al., 2019; Tsiboe, 2018) and also the labour market (García-Perez et al., 2017; Sehnbruch et al. 2020).

Other methodological approaches were also considered, in particular the Partially Ordered Set (Poset) methodology has become a reference over the years (Annoni & Bruggemann, 2009; Fattore, 2016, 2017; Carlsen & and Bruggemann, 2017). Poset is a suitable methodology also for systems of cardinal indicators (Alaimo et al., 2020; Fattore, 2018; Kerber & d Bruggemann, 2015) and for their synthesis over time (Alaimo, 2020; Alaimo & Maggino, 2020). However, in the end, this paper opted for the Alkire Foster method presented below as this has become a well-known methodology that policy makers, experts and pundits understand as it is consistent with their approach to the measurement of multidimensional poverty. In the case of Central America, the use of the Alkire Foster method is particularly relevant from a policy perspective as several countries in the region have designed and implemented multidimensional indicators using this methodology to guide social policies during the last lustrum.[15]

The following paragraphs summarise how this paper applies the Alkire/Foster method to the subject of QoE deprivation (Alkire & Foster, 2011). The QoE deprivation index proposed observes a number of d dimensions or attributes for n individuals that define a d x n matrix. x_{ij} denotes the attributes presented by an individual $i$in each dimension j of the QoE index. A deprivation cut-off z_j for each dimension j under consideration then sets the minimum attributes required to be considered as non-deprived. This first cut-off allows the identification of those individuals who are deprived in each dimension. Therefore, a person i is deprived in a dimension j if $x_{ij} < z_{j,}$ and is not deprived if $x_{ij \geq} z_j$. A deprivation matrix g^0 can be generated that summarises the deprivations of each individual i for any given dimension j. This matrix shows $g^0{}_{ij} = 1$ when $x_{ij} < z_{j,}$ and $g^0{}_{ij} = 0$ if not. The sum of $g^0{}_{ij}$ divided by the population is then defined as the raw headcount ratio.

Based on their deprivation profile, each person is assigned a deprivation score that reflects the breadth of their deprivations across all dimensions. The deprivation score is given by $c_i = \sum_1^d g_{ij}^0 w_j$, where w_j reflects the weight assigned to dimension j and $\sum_1^d w_j = 1$. The deprivation score of each person is the sum of their weighted deprivations. Formally, the deprivation score (c_i) increases as the number of deprivations a person experiences increases, and reaches its maximum of 1 when the person is deprived in all dimensions. A person who is not deprived in any dimension has a deprivation score equal to 0. The identification is straight forward: An individual i is considered to have poor QoE if their deprivation score is equal or higher than a certain cut-off k.

The headcount measure ($H(k)$) estimates the proportion of workers with poor QoE, i.e. the sum of the identified individuals who have a low QoE (i.e. at least k deprived

[14] See for example: Alkire & Fang, 2019; Ke-Mei Chen, 2019: Ervin, 2018; Quang Pham &Mohanty, 2018; and Mukhopadhaya, 2018.

[15] The countries mentioned and the year they created their MPI are as follows: Guatemala (2019), Dominican Republic (2017), Panama (2017), Honduras (2016) and El Salvador (2015).

dimensions) compared to the total population of workers under consideration. The average intensity share (*A(k)*) estimates the depth of deprivation in society. The intensity A can be described as the average deprivation score among those workers who have poor QoE divided by the total population. Finally, the aggregated measure $M_0(k)$ represents the percentage of individuals in poor QoE adjusted by how acute their condition is.

$$M_0(k) = \frac{1}{n}\sum_{i=1}^{n}\left[c_i \times I\left(c_i \geq k\right)\right] = H(k) \times A(k)$$

where the identification function I(•) is equivalent to 1 if the content is true and 0 if not. The adjusted headcount ratio (M_0(k)) is calculated by multiplying the incidence (H(k)) by the intensity (A(k)). M_0(k) = H(k) x A (k). M_0(k) not only summarises information about the occurrence and extent of low-quality employment but also fulfils a set of relevant axiomatic properties.[16] Among these, the dimensional and subgroup decomposition allows us to know which groups of workers have higher rates of deprivation and which job characteristic(s) contribute more to this result.

A crucial indicator that can be broken down into its constituent dimensions is the censored headcount ratio (Alkire & Foster, 2011). The censored headcount is the proportion of individuals who are deprived in a particular dimension *and* have low quality of employment at the same time h_j(k). When a union approach is implemented, the censored and the raw headcount ratios are equivalent. When an intersection approach is used, the raw headcount will be equivalent to the headcount ratio (*H(k = 100%)*). The weighted sum of the censored headcount ratios is equivalent to the $M_0(k)$ indicator.[17]

$$M_0(k) = \sum_{j=1}^{d} w_j \frac{1}{n}\sum_{i=1}^{n} g_{ij}^{0} \times I\left(c_i \geq k\right)$$

An index of the QoE could be positively or negatively oriented (IDB, 2017). Scholars have transformed the traditional Alkire/Foster method into a positively oriented measure by exploring its complement ($1-M_0(k)$).However, the dimensional decomposition of the resulting model is not straightforward.[18] In this paper, we constructed a negatively oriented measure that reproduces the decomposition properties proposed by Alkire/Foster.

3 Data

To estimate QoE deprivation levels in Central America, this article uses data from the *Encuesta Centroamericana sobre Condiciones de Trabajo y Salud*, ECCTS (Centralamerican Employment and Health Conditions Survey). As discussed above, the ECCTS is a cross-sectional survey applied in 2011 in six Central American countries: Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama to all workers aged 18 or older. The survey questionnaire is based on the European Working Conditions Survey, as well as

[16] For more information on the properties of multidimensional indices see Alkire and Foster (2011).

[17] A multi-dimensional indicator could take on one of two orientations: a positive or negative one. This index is oriented negatively, meaning a higher H, A or M0 implies poorer employment quality.

[18] Two examples of this kind of indices are the Gross National Happiness index of Bhutan (Ura et al., 2012) and the empowerment of women in agriculture index (Alkire et al., 2013).

on the ILO's guidelines on Occupational Injury Statistics and its 12-item General Health Questionnaire (Benavides et al., 2014).

The survey's sample encompasses 12,024 cases that are distributed equally among these six countries (2004 each). This sample was randomly selected based on information from the last census available in each country (or electoral registers if the census was unavailable), by using a two-step stratified sampling method. The resulting survey sample is representative at national levels and of Central America as a region, and weights were applied to correct differences between the sample and the population (Benavides et al., 2014). Also, the survey was designed to measure employment conditions at the individual level, which is a valued property when establishing multidimensional measures (Alkire et al., 2015). Finally, an essential advantage of this survey is that it applied the same questionnaire in all six countries with very few context related changes, and that it included a much broader range of variables than is normally covered by household or labour force surveys in Latin America. The use of a single questionnaire implies that there is no need to harmonise the selected variables across countries. The ECCTS thus represents a *unique* source of information on the QoE in developing countries.

4 Dimensions, Indicators and Weights

As discussed above, the QoE deprivation index presented here uses available information from the ECCTS survey, resulting in an index composed of four dimensions and nine indicators. Following recommendations made by the existing literature on job quality, the dimensions include indicators on the quality of labour earnings, employment stability, employment security and employment conditions (Green & Mostafa, 2012; OECD, 2014). Even though the variables included in this index are not exhaustive due to the data constraints mentioned, they serve to illustrate to what extent workers achieve essential capabilities and functionings in their respective labour markets. The dimensions and indicators together with their respective weights are summarised in (Table 2) below.

4.1 Dimensions and Indicators

4.1.1 Quality of Labour Income

Following Sehnbruch et al. (2020), the first dimension of this index considers a worker's earnings, which are considered a crucial resource to developing other capabilities in the labour market as well as a measure of a worker's status and achievement. The cut-off line in this dimension is defined as a salary threshold of at least six basic food baskets, which is equivalent to the official poverty line for three people taking into account that the median number of dependents per worker in Central America is two. Although this threshold is basically equivalent to official poverty lines and therefore not enough to allow workers and their families to develop fully their capabilities or a life project that consists of more than just subsisting (Nussbaum, 2003), using higher cut-offs resulted in such extremely high deprivations rates as to make this indicator impracticable.

The value of the six national basic food baskets was expressed in the country's currency and taken from the data provided by the Economic Commission for Latin America and the Caribbean (ECLAC, 2016). In the case of Guatemala, this information was unavailable for

the survey year, so data from the closest year available from the national statistics office was used.

Several alternative income measures and different cut-off points were also tested for this paper (see Table 5 in the Appendix): for instance, based on the OECD's (2014) methodology, a relative labour income indicator that could complement absolute income data was also tested. This indicator considered 60% of the median labour income as a deprivation threshold, following the logic that an individual's utility depends on both his or her income and that of others (Duesenberry 1949). However, this cut-off proved inappropriate for the countries studied as high inequality levels led to very low deprivation levels. Alternatively, legal minimum wage thresholds resulted in very high deprivations rates as most Central American countries have very large informal sectors, where minimum wage legislation does not apply.

Finally, robustness testing was undertaken for four, six and eight basic food baskets per worker in the year 2011. The ranking groups were robust and stable to the different parameter values. These groups were composed of countries that had a better QoE index, such as Panama and Costa Rica, one composed by Nicaragua and El Salvador, which presented a medium level of achievement, and a group with very poor quality employment, composed of Honduras and Guatemala (See Sect. 5.5 on robustness).

4.1.2 Employment Stability

The second dimension of this index considers the importance of having a stable job with a low risk of unemployment as the stability of employment is fundamental to a workers ability to develop in the labour market.[19] This dimension therefore encompasses two indicators: First, workers are deprived if they have worked for less than three years in their current job so as to be covered by severance pay legislation that would provide enough funds to cover a period of unemployment of approximately 5 months with a salary replacement rate of 60%. The three years threshold was also selected as it constitutes the minimum period necessary for workers to acquire appropriate on-the-job training and experience (Busso, 2017).

The second indicator considers that workers are deprived if they have been unemployed during the twelve months prior to the survey date as these workers are generally not yet covered by any employment protection legislation or other labour legislation, which only becomes applicable after a worker has been employed for at least 12 months. The combination of these two indicators effectively means that workers, who have been employed for less than 12 months in the same job are counted twice in this methodology, which amounts to a double weighting of their deprivation in an effort to account for the fact that being employed for less than one year leaves a worker without employment protection legislation.

4.1.3 Employment Security

Equally important is the third dimension of this indicator, which relates to how a worker is able to overcome potential losses of income, for example as a result of a health problem or retirement. The first indicator in this dimension therefore considers that a worker

[19] In this, we attempt to follow the conceptualisation and methodology for measuring job quality put forward by the OECD (2014), which includes the measurement of unemployment risk.

Table 2 Dimensions, indicators and weights

Dimension	Indicator	Cut-offs (A individual is deprived if …)	Weight
Labour income	Earnings	Income is lower than 6 times the national Basic Food Basket (Using ECLAC data)	1/4
Employment stability	Tenure	Less than 36 months in the current job	1/8
	Unemployment risk	Having been unemployed at least once during the previous 12 months	1/8
Employment security	Social security	No affiliation to a social security system	1/8
	Occupational status	Self-employed without higher education or employed without a contract	1/8
Employment conditions	Excessive working hours	Works more than 48 h per week	1/16
	High work intensity	Frequently experiences at least two labour demands in the following dimensions: (1) working at very high speed during more than half of the workday, (2) working to tight deadlines more than half of the workday or (3) not having enough time to finish tasks	1/16
	High posture related risk	Experiences at least two labour demands for more than half of the workday in the following aspects: (1) working in a tiring and painful position (2) carrying or moving heavy loads or (3) performing repetitive movements	1/16
	High physical risk	Experiences at least one labour demand related to the working environment for more than half of the workday in the following aspects: (1) exposed to high noise or (2) exposed to extreme temperatures	1/16

is deprived if s/he is not affiliated to a pension system, which is considered to be a proxy variable for affiliation to other social protection systems and an indicator of having access to appropriate levels of social security coverage.

Ideally, the survey should have asked whether workers are *contributing* to a pension system at the time of the survey, but this question was not included in the survey questionnaire. The limitation of using affiliation as an indicator is that being affiliated with the system does not ensure regular contributions, so that workers may not receive adequate levels of pensions. However, being affiliated to a pension system is better than nothing at all. This is an example of where data limitations restrict the variables we can include in this index.

The second indicator in this dimension considers the occupational status of workers, who are deemed deprived if they do not have a formal written contract or are self-employed without a professional qualification. These workers are considered to have less secure jobs as they do not have a legal status that entitles them to being covered by the regulation of the labour codes in their respective country.

4.1.4 Employment Conditions

Finally, the fourth dimension of this index reflects the quality of the working environment, as defined by the OECD's, 2014 methodology, and underpinned by Nussbaum's concept of bodily well-being (Nussbaum, 2003). Following this approach, indicators such as work pace and hours of work were considered, along with actual health risks at the workplace. Overall, the variables and cut-offs used in these dimensions are derived from the way in which the ECCTS survey was designed, taking into account that this survey was designed and implemented by a group of occupational health experts (Benavides, 2014). The cut-off lines therefore reflect the measures that the survey deemed essential for measuring health risks. For example, questions relating to high work intensity, posture related risk and physical risk consider that being exposed to these risks for more than half of the working time constitutes a significant health risk.[20]

The presence of extensive working hours reduces the spare time spent at home or in other activities that could contribute to personal freedoms related to self-realisation. Excessive working hours are also considered a significant stress factor by the occupational health literature and a cause of work-life imbalance (Harrington, 2010; Lawton & Tulkin, 2010). Therefore, workers who spend more than 48 h per week at work, were considered deprived in that they were experiencing excessive workloads, following the cut-off point recommended by the ILO (2013). Also, the working time distribution and a worker's capacity to organise working time is relevant. Workers who experience at least two labour demands in this aspect were considered deprived. The labour demands considered by this indicator are: (1) working at very high speed, (2) working to tight deadlines more than half of the workday and/or (3) not having enough time to finish tasks.

With the intention of incorporating capabilities generated by bodily health, this indicator also includes three variables related to health risk at the workplace, such as working in a tiring and painful position, carrying or moving heavy loads and/or

[20] Note that the answers relating to these questions in the ECCTS provide respondents with the categories of "never", "less than a quarter of the time", "between a quarter and half the time" and "more than half the time" as options in the answers. Being exposed to the risks asked about in these variables for more than half the time is therefore considered as the maximum risk level analysed by this survey.

performing repetitive movements. The cut-off line of this indicator requires a worker to experience at least two of these labour demands.

The final indicator in this dimension considers workers to be deprived if they experience labour demands related to the working environment for more than half of the workday in at least one of the following aspects: being exposed to high noise or extreme temperatures. On this indicator, the cut-off was set at one labour demand.

4.2 Weights and Cut-Offs

The weighting structure of multidimensional indices generates much debate because assigning weights to different dimensions implies valuing their importance in achieving general well-being. Therefore, it is crucial to submit the debate on weighting selections to public discussion (Alkire & Foster, 2011; Foster & Sen, 1997). Indices should also be robust to different weight structures (Alkire et al., 2010). On the processes of selecting weights, different perspectives can be found in the literature (Alaimo & Maggino, 2020; Gan et al., 2017). It is possible to choose a structure based on normative, empirical or an equal weighting criterion (Belhadj, 2012; Decancq & Lugo, 2013).

In this paper, and following Sehnbruch et al. (2020), an equal weighting structure is used to assign equal importance to each dimension of the QoE deprivation index. (Alternative weighting structures were tested: see Table 6 in the Appendix) Regarding the overall cut-off line of the index, this is the number of dimensions considered for a worker to be classified as deprived; following Alkire and Foster's (2011) discussion of the union and intersection approaches, three different approaches to cut-off lines exist: the first refers to the percentage of individuals who are deprived in at least one dimension of the QoE Index, which is aligned with the union approach. The union approach identifies a worker as being deprived if s/he is deprived in at least one dimension. This approach is based on the idea that one deprivation is sufficient to make a person deprived. If this approach is applied to the measurement of the QoE, it would mean that a person deprived in one dimension does not have good QoE.

However, the union approach has been criticised for not enabling policymakers to prioritise their efforts to reach the most deprived population as it produces very high levels of deprivation. By contrast, the intersection approach considers workers to be deprived only if they are below the cut-off in all the dimensions under consideration, which is a very demanding criterion and generates very low rates of deprivation. This approach would be appropriate only if the purpose of the proposed index were to measure extremely poor-quality jobs.

Instead, this study presents a more nuanced understanding of the QoE: it uses a dual approach as defined by Alkire and Foster (2011), which means that it considers a worker to be deprived if $k => 0.5$, i.e. in at least two dimensions or in a number of indicators, which add up to 0.5 in terms of their weights.

5 Data Considerations: Missing Values and Indicator Correlations

Sample biases are common in the literature due to difficulties with data collection, mainly as a result of underreporting (Moore, 2000). The calculation of the QoE deprivation index took the issue of sample bias into account and analysed the issue of missing values. The

missing values were dropped from the entire sample. Analysis presented in Table 7 in the Appendix shows missing values and there is no significant difference between the original and the reduced sample as dropped individuals do not represent a systematic bias towards particular groups from the sample when computing for sociodemographic characteristics.

To assess the associations between indicators, the Cramer V correlation coefficient between all pairs of deprivation indicators was computed as suggested by Alkire et al. (2015) (see Table 8 in the Appendix). The Cramer's V correlation coefficient analyses the matches between deprivations as a proportion of the minimum of the marginal deprivation rates, meaning that the measure displays the number of observations that have the same deprivation status in both variables. In turn, this reflects the joint distribution as a minimum of the uncensored headcount ratios.

In terms of Cramer's V, it can be observed that–on average–the correlations between indicators are low. Although correlation is higher between earnings and social security and occupational status as well as between social security and occupational status, but the average coefficient is not higher than 0.40.

6 Results

6.1 Deprivation Rates by Indicator

Table 3 presents a dashboard of the uncensored headcount ratios in each of the nine indicators that compose the QoE index for the six countries considered in this study. The data shows that the indicators which present the highest levels of deprivation are those related to income, social security affiliation and work intensity. In the income dimension, deprivation levels are close to 70% in more than half of the countries studied while the social security indicator presents an average rate of deprivation of 66.8% and exceeds 70% in four out of the six countries. Being deprived in these indicators represents a very discouraging scenario, especially in countries where there is no welfare state to support individuals who experience adverse shocks. The high levels of deprivation in the social security affiliation indicator reflect this institutional deficit. By contrast, the lowest average deprivation rates are associated with high environmental/physical risk and unemployment, which affect approximately 10% of the labour force. Together these trends indicate that in Central America QoE deprivation is strongly affected by the lack of social protection and income, which can seriously stymie the development of individual capabilities.

Despite these high levels of average deprivation, differences emerge between countries in the region. An in-depth look at each country's performance shows interesting results: for instance, in the case of Honduras and Guatemala, the tenure indicator is lower than the regional average, indicating low turnover. However, these countries have very high deprivation rates in their occupational status indicator. These results may seem counterintuitive but make sense if we take into account that self-employed workers rarely become unemployed as they have no employer to make them redundant. In general, self-employed workers in Latin America have more stable jobs than salaried workers, although their income levels may fluctuate significantly during economic downturns (Ramos et al., 2015).

The results also suggest that some trade-offs could exist between the indicators. These trade-offs imply that we may be observing jobs with different combinations of deprivations. As discussed above, jobs in Honduras and Guatemala might be more stable but are

Table 3 Raw headcount by indicator (%)

		Guatemala		Honduras		Nicaragua		Costa Rica		Panama	
Dimension	Indicator	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Labour income	Earnings	72.5	0.013	75.1	0.015	73.9	0.013	45.8	0.019	31.1	0.014
Employment stability	Tenure	28.6	0.016	22.8	0.016	31.4	0.015	37.0	0.016	34.2	0.015
	Unemployment risk	10.0	0.010	7.7	0.008	15.6	0.011	9.8	0.012	10.2	0.012
Enployment security	Social security	85.0	0.014	88.1	0.012	71.8	0.014	35.8	0.018	42.2	0.011
	Occupational status	49.5	0.018	46.9	0.017	21.2	0.010	26.1	0.014	13.6	0.008
Employment conditions	Excessive working hours	42.1	0.014	37.7	0.019	33.9	0.015	39.9	0.017	30.7	0.013
	High work intensity	63.8	0.015	79.5	0.013	80.8	0.010	81.1	0.012	70.0	0.016
	High posture related risk	16.3	0.013	12.9	0.010	5.5	0.005	9.4	0.010	5.3	0.005
	High physical risk	6.6	0.007	9.8	0.008	6.0	0.006	7.2	0.009	4.0	0.006

also typically informal. This situation contrasts with jobs in Panama and Costa Rica, which have higher job rotation rates, but lower levels of deprivation in the dimension of employment security. Another trade-off occurs between labour income and extended hours of work. A worker may have a relatively high wage but works for extended hours, under an uncertain occupational status or harsh working conditions.[21]

Honduras presents the highest levels of deprivation in income and social security as well as the second-highest level of deprivation in the occupational status, high work intensity and posture related risk indicators. Following a similar pattern, Nicaragua shows high levels of deprivation in terms of unemployment risk and high work intensity as well as in the labour income dimension. However, with a dashboard of results, it is not possible to state which of these two countries is doing better or worse overall.

Apart from not allowing for the comparison of countries, the dashboard of indicators presented in Table 3 also does not allow for the analysis of simultaneous deprivations among workers, or how these deprivations are distributed across the labour force. From a policy perspective, it is impossible to identify the most vulnerable workers with a dashboard. The deprivation levels presented above, therefore, illustrate the need for calculating aggregated measures that can overcome these drawbacks and focus on multi-dimensionally deprived groups or individuals.

6.2 Aggregated Results

As discussed in the methodological section of this paper, each person's deprivation profile is assigned a score, which reflects their simultaneous deprivations. Figure 1 shows how these scores are distributed within each country. The 0% marker in Fig. 1 represents the 50% cut-off ($k \geq 0.5$). Individuals who are above this cut-off line are deprived with the graph illustrating their particular degrees of deprivation, while those below the line are not. The graph shows that Guatemala, Honduras and El Salvador have a higher percentage of deprived workers than the Central American weighted average. Nicaragua, Costa Rica and Panama have lower percentages of deprivation. In all countries, most of the deprived individuals are closer to the cut-off line, showing that only very few workers are deprived across all dimensions and therefore have higher scores ($c_i = [0.7,1]$). Conversely, extremely few workers in the countries have perfect scores that show they are not deprived in *any* dimension or indicator. Only Panama has a percentage of workers with perfect scores that exceed 5%.

Importantly, it must be noted that being able to examine the distribution of the c_i scores across the workforce is crucially useful to policymakers, who can thus identify the most vulnerable workers in the workforce, i.e. those who are extremely deprived. For example, in the countries studied public policy could focus on targeting employment subsidies or vocational training as well as income support at those workers who have a $c_i = [0.7,1]$ or $c_i = [0.6,1]$.

[21] Correlations between the different indicators of the QoE Index are presented in in the Appendix.

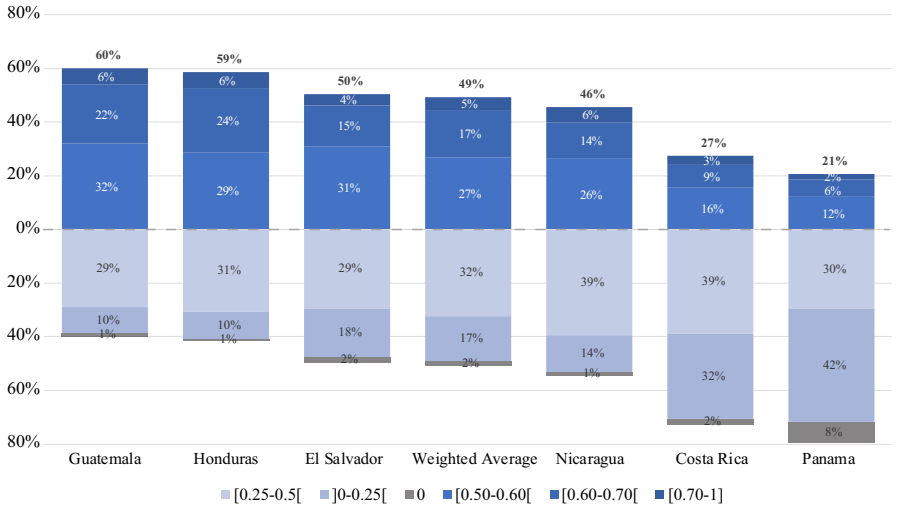

Fig. 1 Deprivation scores (analysing the c_i vector) *Source* Own calculations based on ECCTS survey data from 2011

7 Multidimensional Headcount Ratios (H), Intensity (A) and the Adjusted Multidimensional Headcount Ratio (M_0 = QoE Index)

As discussed in Sect. 5.1, dashboard indicators do not allow for the comparison of the performance of individual countries compared to their peers. For this, aggregated measures are necessary. Table 4 presents the Multidimensional Headcount Ratio (H), the average deprivation shares among individuals with a low QoE or intensity (A) and the Adjusted Headcount Ratio (M_0) for the constructed QoE deprivation index in the six countries considered in the ECCTS survey in 2011, considering a 50% cut-off. The results show that QoE deprivation varies substantially between Central American countries.

The range of variation between countries is quite substantial for the H ratio, ranging from 60.1% in Guatemala to 20.6% in Panama. Overall, Guatemala and Honduras present the highest H ratios, followed by Nicaragua and El Salvador, with Costa Rica and Panama showing the lowest levels of deprivation at 27.4% and 20.6% respectively.

Despite significant differences in the H ratios between countries, the range of the results in terms of the intensity of deprivation (A) is lower across the countries studied, fluctuating around 60%. This means that in all countries studied those workers, who are deprived in terms of their H ratios, are relatively equally deprived in terms of the number of indicators in which they are deprived. Overall, this means that the dispersion of the results in terms of the M_0 score is lower, ranging from 0.362 in Guatemala and Honduras (0.35) at the top end 0.16 and 0.12in Panama and Costa Rica respectively at the bottom. Again, El Salvador (0.30) and Nicaragua (0.28) fall into the middle distribution of performance. These results allow the countries studied to be grouped into pairs with higher, medium and low performance in terms of their QoE deprivation. Figures 6 and 7 in the Appendix shows

Table 4 H, A and M0 ($k \geq 0.5$)

	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panama
H	60.1%	50.4%	58.6%	45.7%	27.4%	20.6%
	(0.015)	(0.0217)	(0.018)	(0.013)	(0.015)	(0.012)
A	60.2%	59.5%	60.6%	60.1%	60.0%	59.1%
	(0.003)	(0.003)	(0.003)	(0.004)	(0.005)	(0.005)
M0	0.362	0.299	0.355	0.275	0.164	0.122
	(0.009)	(0.0128)	(0.014)	(0.008)	(0.009)	(0.007)

Standard errors in parenthesis. Source: Own calculations based on ECCTS survey data from 2011

that these three pairs of countries are robust using standard errors and different parameter estimations.

7.1 Dimensional Decomposition of the QoE Index (M0)

The measures discussed above show a coherent comparative picture of QoE deprivation in Central America. Even though at a regional level there are some similarities, a more precise comparison can be established, for example, when considering pairs of countries that present similar QoE index results, as described above, but have different contribution percentages from each dimension or indicator to M_0.

Following Alkire and Foster (2011), Fig. 2 presents the percentage contribution of each dimension to the QoE deprivation index results by country.[22] The decomposability of the QoE deprivation index permits an analysis of how each dimension or indicator contributes to the overall index result (Alkire et al., 2015). When the contribution of a particular dimension or indicator is higher than its proportional weight of 25%, this means that this dimension contributes more significantly to overall deprivation levels.

The dimensional decomposition of the index shows that income is the highest contributor to deprivation levels in all countries. The second most important dimension is employment security, which is driven by low rates of social security affiliation and deprivation in terms of the occupational status of workers. By contrast, employment conditions and stability contribute relatively less to the overall QoE deprivation index result. The lack of income is especially significant in developing countries where welfare systems are patchy and do not cover people equally. Also, not having insurance for different events (for instance unemployment, health problems or retirement) means that people are highly dependent on their ability to generate continued resources, even in old age.

Although it appears from Fig. 2 that the dimensions of employment stability and employment conditions contribute less to the overall QoE deprivation results, it is important to highlight that this does not mean that these dimensions make an important contribution to the indicator. With regard to employment stability, it can be observed that as countries develop and the proportion of workers with formal written contracts increases, for example in Panama and Costa Rica, the question of whether these contracts are fixed-term or open-ended becomes more relevant, as does the duration of these contracts. This finding mirrors results presented in Sehnbruch et al. (2020), which show the same pattern in other Latin American countries. Similarly, the dimension of employment conditions is an

[22] For indicator decomposition see Table 10 in the Appendix.

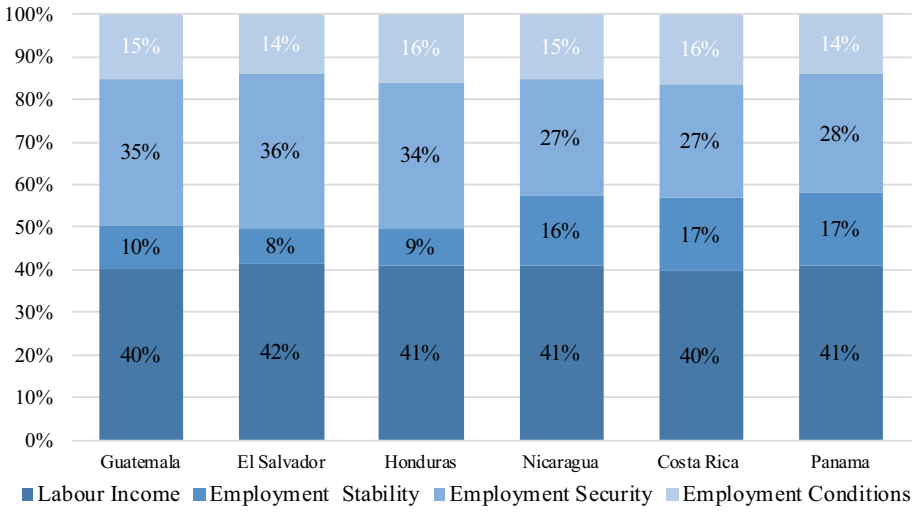

Fig. 2 Dimensional decomposition (%) of the QoE Index by dimension (k ≥0.5) *Source* Own calculations based on ECCTS survey data from 2011

important component of this indicator. If employment conditions are such that they negatively affect a worker's health and bodily integrity, this worker's future ability to participate productively in the labour market and develop his or her capabilities can become severely impaired. It is therefore extremely important that this aspect of the QoE deprivation should be monitored by an index such as this one.

This analysis complements the general indicators, but a more in-depth analysis is required when comparing countries that present similar results in terms of their H and M_0 ratios, such as El Salvador and Nicaragua. Both achieve relatively comparable results overall, but the contributions of the indicators included in the index differ. The Employment Security dimension is more significant in Nicaragua than in El Salvador, particularly as the indicator of occupational status contributes more to the overall result. Another difference emerges when comparing Costa Rica and Panama: social security deprivation contributes more to overall deprivation levels in Panama than in Costa Rica.

7.1.1 Subgroup Analyses

Another advantage of the QoE deprivation index is that it shows how different deprivations are distributed among particular groups of workers.[23] Figure 3, for example, presents the results for H and A by rural and urban areas and illustrates the patterns that emerge. In general, and compared to their urban counterparts, workers in rural areas are significantly more deprived in terms of their overall H ratio, while urban workers rank worst in terms of their intensity (A) ratios. Only Nicaragua and Panama show similar levels of deprivation between rural and urban populations. By contrast, Guatemala and El Salvador have the biggest differences between their urban and rural deprived individuals with a 0.09 and 0.10 difference, respectively. Additionally, urban and rural population within countries can be grouped into low, medium and high deprivation rates, separated by lines in the graph. For example, Costa Rica and Panama are predominantly better off in terms of H for urban *and*

[23] For complete subgroup results (including gender, area and age groups) see Table 11 in Appendix.

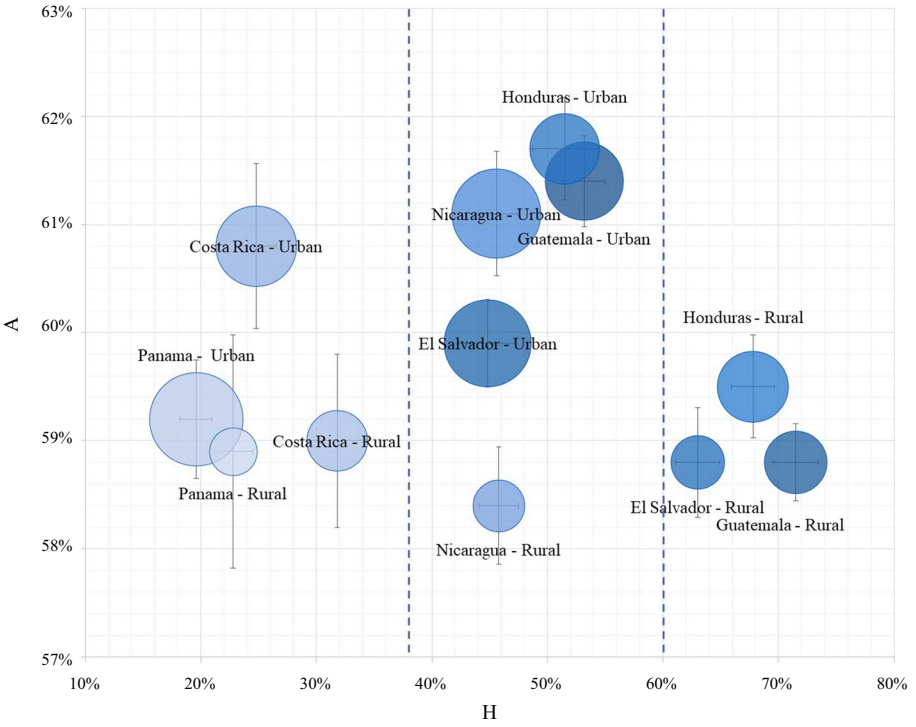

Fig. 3 H and A for Urban and Rural subgroups *Note: The bubble size represents the percentage of urban or rural population within countries. Confidence intervals are represented by the crossing lines. Source* Own calculations based on ECCTS survey data from 2011

rural populations within a 20–30% range, while the most deprived workers are those who work in rural areas in the other countries.

Overall, one question that emerges from this type of analysis is whether the QoE deprivation index adds value to existing measures of poor quality employment, such as the ILO's definition of vulnerable employment (see Table 1 in this paper).[24] A quick comparison of the H ratios produced by the QoE deprivation index shows that this index generates a greater percentage of deprived workers than the vulnerable employment rate. This prompts the question of why the H ratio is so much higher. Further analysis of the data presented in Fig. 4 below provides a clue: as the definition of vulnerable employment includes only self-employed workers and non-remunerated family members, it implicitly assumes that formal salaried workers (not included in this definition) are not vulnerable in terms of their status in the labour market. Figure 4 shows that a significant number of workers with formal written contracts–both open-ended and fixed term–have such poor employment conditions overall that they are considered deprived by this index.

For instance, in Guatemala, 32% of the employees with indefinite contracts are considered deprived by this indicator. In Honduras and Nicaragua, nearly 1 out of 4 workers with indefinite contracts are deprived. In the case of workers with fixed-term contracts,

[24] This paper uses vulnerable employment as a definition for comparative purposes as the ILO's definitions of the informal sector have changed over time, and could not be replicated with data from this survey.

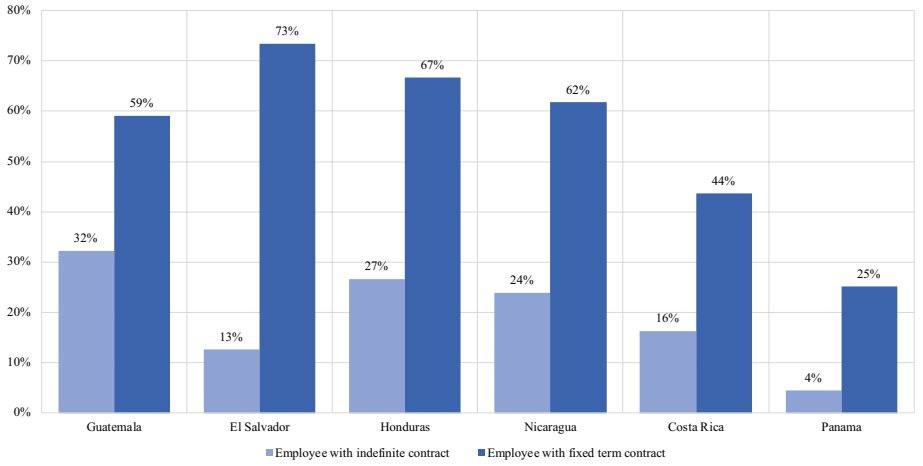

Fig. 4 Percentage of people with low quality of employment among employees with indefinite and fixed term contract by country *Source* Own calculations based on ECCTS survey data from 2011

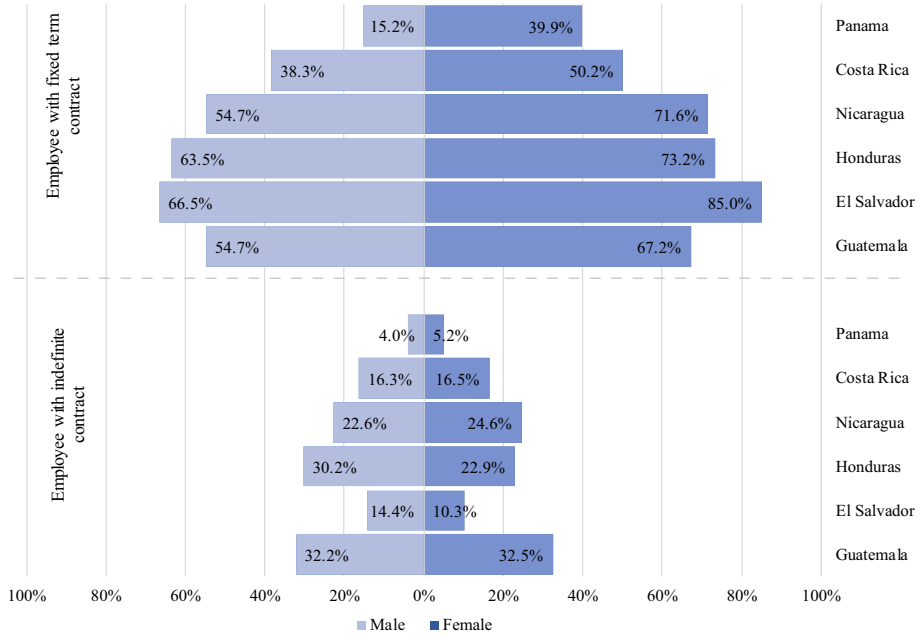

Fig. 5 Percentage of people with low quality of employment among employees with indefinite and fixed term contract by sex and country. *Source* Own calculations based on ECCTS survey data from 2011

the results are unambiguously worse. In El Salvador 73% of these workers are deprived, while in Guatemala, Honduras, and Nicaragua this figure is above 59%. Even in Central America's best-case scenario, Panama, a quarter of workers with fixed-term contracts turn

out to be deprived according to the QoE deprivation index. These workers would not be considered deprived by traditional definitions of vulnerable employment.

An even more complex picture emerges if we consider how contracts and QoE deprivation are distributed between men and women in the labour market. While the results presented in Fig. 5 show that the proportion of workers with open-ended contracts who are deprived are equally distributed between men and women, with two countries (Honduras and El Salvador) even having lower levels of deprivation among women with open-ended contracts, the opposite picture emerges when we consider fixed-term contracts. Among this group of workers, women are significantly more deprived than men, even in the most developed countries of the region, Costa Rica, and Panama.

7.2 Robustness Testing and Dominance

To test the sensitivity of QoE deprivation, different versions of the index were calculated by eliminating one of the selected indicators for each test trial. Estimations were made for each alternative, by eliminating one indicator at a time, countries were ranked and Spearman rank correlation coefficients were calculated (see Table 8 in the Appendix).The rank correlation coefficients between the baseline QoE deprivation index and the alternatives are all above 0.82 and are significant at the 5% level.

To analyse and select a dimensional cut-off, the dominance of rankings is computed. There is robustness to country groups which hold similar characteristics. These pairings consist of Guatemala and Honduras, Nicaragua and El Salvador, and Costa Rica and

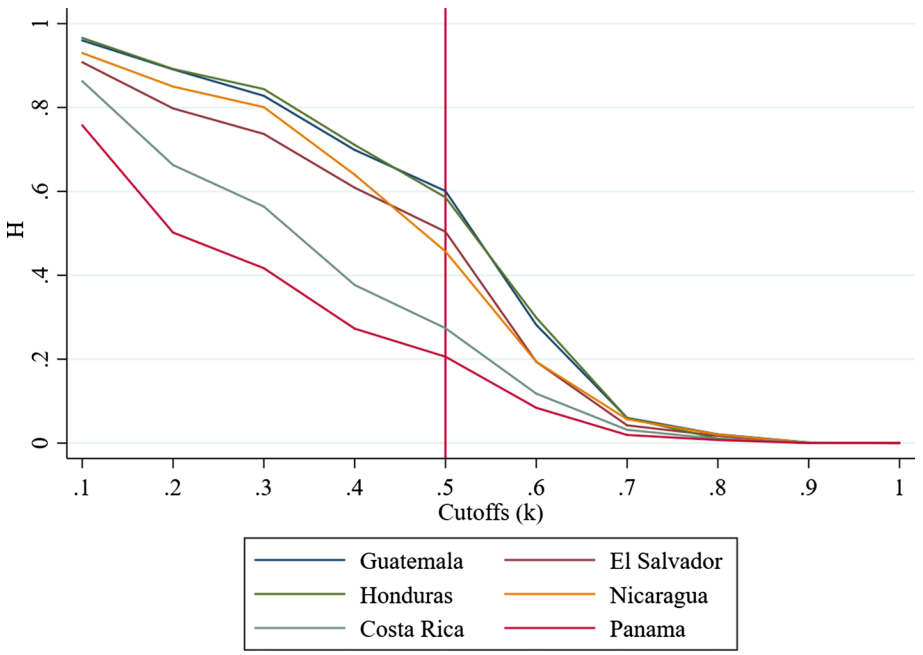

Fig. 6 Dominance for H using different cut-offs *Source* Own calculations based on ECCTS survey data from 2011

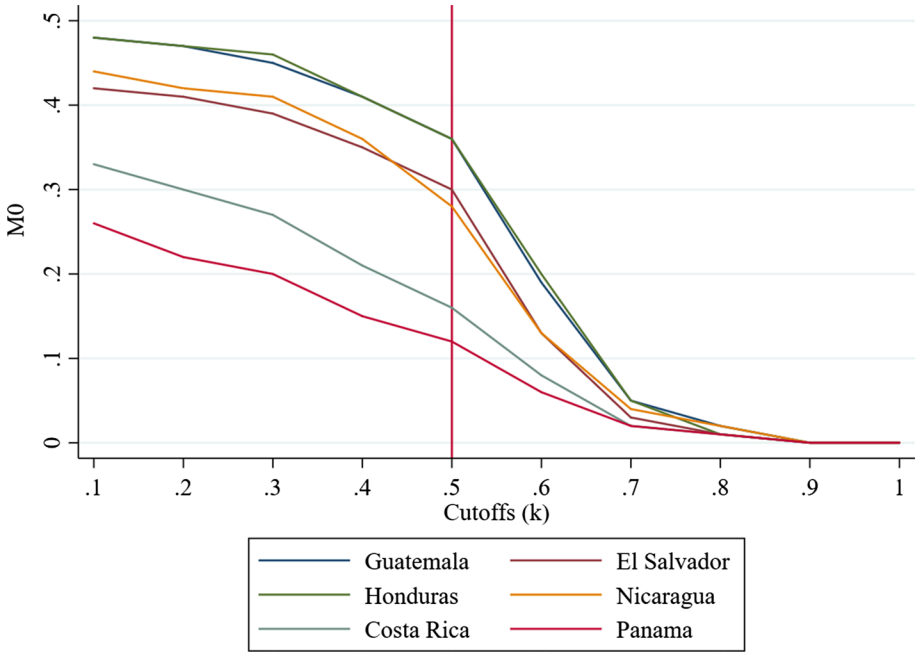

Fig. 7 Dominance for M0 using different cut-offs *Source*: Own calculations based on ECCTS survey data from 2011

Panama. At two dimensions (or k = 0.5) these countries differ and form clear patterns of dominance in H and M0 (for results see Figs. 6 and 7 in the Appendix).

8 Conclusions

This paper shows that the Alkire Foster method for calculating multi-dimensional indices can be usefully applied to the measurement of QoE deprivation. The results reveal different levels of QoE deprivation among the six Central American countries studied, with Guatemala and Honduras presenting very poor results in terms of the index; El Salvador and Nicaragua falling into the middle range of achievement; and Panama and Costa Rica achieving better results. It is important to note that these results are robust. The aggregated measures of the QoE deprivation index allow for the construction of a country ranking based on M_0 outcomes and produces internationally comparable results across a range of developing countries with differing levels of development. It is further important to note that headcount ratios produced by the Alkire Foster method are systematically higher than the intensity indicator A, which varies only slightly between countries. As Fig. 1 shows, many of the workers who are deprived in terms of their QoE are quite intensely deprived. This constitutes a significant contribution to the existing literature on the QoE and an advantage over other methodologies, such as dashboards indices.

At the same time, the multidimensionality of the index constitutes an opportunity to look in-depth at how countries achieve different levels of QoE, and at how different components of the index interact. The inclusion of different dimensions permits a detailed analysis of how the uncensored headcount ratio varies in each indicator. For instance, even though Costa

Rica and Panama have the lowest rates of low multi-dimensional QoE deprivation, they still present high levels of deprivations in some dimensions such as employment stability. Especially relevant are the results produced by job tenure in Costa Rica and Panamá. Also, the dimensional contribution analysis shows a common pattern in all countries, which indicates that income from labour in the region is very deficient, followed by the employment security dimension. These findings contribute to understanding the region as a whole, which can help to identify and analyse common labour market problems and potential remedial policies.

Another advantage of the QoE deprivation index proposed is that it allows policy-makers to identify the most vulnerable groups of workers in the labour force, which is essential for targeting policies appropriately. Although income contributes importantly to the overall QoE deprivation, it is essential to note that around 60% of QoE deprivations result from dimensions *other than income*. In addition, the index focuses policy attention on employment characteristics and deprived individuals in a way that labour policy ordinarily does not consider. For example, Fig. 4 shows that having a formal written contract is not a guarantee of good working conditions. Similarly Fig. 5 shows that women working on fixed-term contracts are particularly vulnerable to poor quality employment in the region.

Although further analysis and disaggregation is necessary to understand these phenomena precisely, this is an important result that should change the way labour markets in developing countries are thought about by experts and policymakers alike. Traditionally, analysts implicitly assume that salaried employees are not among the most vulnerable workers in a labour force. However, results from this QoE deprivation index showed that traditional definitions of vulnerable employment do not capture the full extent or the distribution of poor-quality employment.

Finally, this paper illustrates the need for better and broader information on employment conditions in Latin America and in developing countries more generally. The lack of information provided by traditional labour force surveys or household surveys on physical, environmental or other health risks that workers are subjected to can have serious consequences as policymakers are unlikely to focus sufficient attention on these issues unless they are measured in a more systematic way.

Overall, this paper makes several contributions to the existing literature: first, it uses a capability approach-based index that replicates the Alkire Foster methodology to measure QoE deprivation in developing countries. The use of this theoretical approach and the selection of objective variables at the individual level help overcome some of the incongruences of previous attempts to measure QoE deprivation. Second, the inclusion of dimensions other than income augments the information available for a better understanding of labour markets in Latin American and the Caribbean. This enhanced information is something that other indicators and measurements of QoE deprivation are not able to produce in Latin America, because their data requirements are too sophisticated. Third, the decomposability of this index into groups of individual workers allows for better policy targeting. Fourth, the indicator delivers a policy-relevant measurement, which relies on a synthetic measurement that is easy to communicate.

However, this work serves as an empirical exercise, which fulfils its principal purpose of demonstrating that it is possible and useful to construct a QoE deprivation index using the Alkire Foster method. Individual countries can adapt this method to suit their own purposes in an effort to capture the distinctiveness of a particular labour market. In addition, this paper shows how useful it is to produce homogenous surveys of employment conditions, such as the European Working Conditions Survey. While the ECCTS takes a significant initial step in this direction, the survey should be repeated regularly across a broad

range of countries, preferably with larger sample sizes. For now, a substantial information gap on employment in the context of developing countries remains.

Appendix

See Table 5, 6, 7, 8, 9, 10, 11, 12 and Figs. 6, 7.

Table 5 Cut-off point results for Income indicator

	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama
60% of the median	18.7	14	20.8	19.6	16.6	14.4
Legal minimum wage	44.7	38.73	59.8	40.2	31.6	46.4
Eight times the basic food basket	72.6	84.4	84.7	88.7	89	56.8
Six times the basic food basket	45.8	66.2	72.5	75.1	73.9	31.1
Four times the basic food basket	22.5	39.4	45.2	52.8	53.7	11.4

Source Own calculations based on Decreto No 36636-MOPT (Costa Rica), Decreto No 56 (El Salvador), Acuerdo Gubernativo No 388–2010 (Guatemala), Decretonúm. 189 del 15 de julio de 1959 y Acuerdo No STSS-223–2011 (Honduras), Código del trabajo Ley No. 185 y Acuerdo Ministerial JCHG-06–08-11 (Nicaragua), Decret Ejecutivo No. 263 y Codigo del Trabajo (Panamá) and ECLAC Basic Food Basket dataset

Table 6 M0 results for different weighting schemes

M0 ($k \geq 0.5$)	Guatemala			El Salvador			Honduras			Nicaragua			Costa Rica			Panama		
Weightings	Est	Min	Max	Est	Min	Max	Est	Min	Max	Est	Min	Max	Est	Min	Max	Est	Min	Max
QoE Index (M0)	0.362	0.3529	0.3711	0.299	0.2862	0.3118	0.355	0.3434	0.3666	0.275	0.2667	0.2833	0.164	0.155	0.173	0.122	0.1151	0.1289
Income (50%)	0.51	0.5	0.52	0.45	0.44	0.47	0.53	0.51	0.54	0.5	0.49	0.51	0.31	0.29	0.32	0.21	0.2	0.22
Job Stability (50%)	0.11	0.1	0.12	0.08	0.07	0.08	0.11	0.1	0.11	0.12	0.11	0.13	0.09	0.08	0.09	0.06	0.06	0.07
Job Security (50%)	0.364	0.3526	0.3754	0.31	0.3	0.33	0.36	0.35	0.37	0.19	0.19	0.2	0.14	0.13	0.14	0.1	0.1	0.11
Employment Conditions (50%)	0.17	0.16	0.18	0.12	0.11	0.13	0.18	0.17	0.19	0.12	0.11	0.12	0.08	0.08	0.09	0.05	0.05	0.06

Each one of the alternative weighting schemes gives a 50% preponderance (or weight) to the stated dimensions

Source Own calculations based on ECCTS survey data from 2011

Table 7 Missing values

Dimension	Indicator	Guatemala	El salvador	Honduras	Nicaragua	Costa rica	Panama
Labour income	Earnings	352	5	7	22	611	77
Employment stability	Tenure	52	42	15	2	19	96
	Unemployment risk	35	17	6	18	41	12
Employment security	Social security	37	0	4	0	0	98
	Occupational status	14	7	0	2	30	1
Employment conditions	Excessive working hours	39	16	18	7	4	47
	High work intensity	37	4	7	5	8	16
	High posture related risk	37	7	58	2	1	20
	High physical risk	0	0	0	0	0	0

Source Own calculations based on ECCTS survey data from 2011

Table 8 Correlations for indicators

Cramer's V	Earnings	Tenure	Unem-ployment risk	Social security	High work intensity	High posture related risk	High physical risk
Earnings	1						
Tenure	0.0236	1					
Unemployment risk	0.0417	0.296	1				
Social security	0.3993	− 0.1015	− 0.0092	1			
Occupational status	0.2817	− 0.1234	− 0.0756	0.3918			
Excessive working hours	− 0.0367	0.0084	− 0.0048	0.0501			
High work intensity	0.0827	− 0.0204	− 0.04	0.058	1		
High posture related risk	0.0277	− 0.0612	0.0111	0.0904	− 0.0972	1	
High physical risk	− 0.045	0.0024	0.0237	− 0.0043	− 0.1418	0.2177	1

Source Own calculations based on ECCTS survey data from 2011

Table 9 Spearman rank correlation coefficients

k ≥ .5	QoE Index	Earnings	Tenure	Unemployment risk	Excessive working hours	High work intensity	High posture related risk	High physical risk
QoE Index	1							
Earnings	0.8286	1						
Tenure	0.9429	0.7143	1					
Unemployment risk	1	0.8286	0.9429	1				
Social security	0.8857	0.8286	0.9429	0.8857				
Occupational status	0.8857	0.8286	0.9429	0.8857				
Excessive working hours	1	0.8286	0.9429	1	1			
High work intensity	1	0.8286	0.9429	1	1	1		
High posture related risk	1	0.8286	0.9429	1	1	1	1	
High physical risk	1	0.8286	0.9429	1	1	1	1	1

Table 10 Decomposition: Percentage contribution to the QoE Index (M0) (%) *Source* Own calculations based on ECCTS survey data from 2011

Indicator	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panama
Earnings	40.3	41.5	40.9	40.9	39.8	41.2
Tenure	7.4	6.2	6.6	10.4	12.4	12.2
Unemployment risk	2.7	2.1	2.3	6	4.7	4.6
Social security	20.2	20.5	20.3	18.9	16.1	18.9
Occupational status	14.3	15.9	14.1	8.3	10.6	9
Excessive working hours	5	3.5	4.5	5	5	4.7
High work intensity	7.1	7.3	9.1	8.9	9	8.6
High posture related risk	2.2	1.3	1.4	0.8	1.6	0.5
High physical risk	0.8	1.7	0.9	0.7	1	0.4

Table 11 Multidimensional Headcount Ratio (H), Intensity (A) and Adjusted Multidimensional Headcount Ratio (M0 = QoE Index) by gender, area and age group ($k \geq 0.5$)
Source Own calculations based on ECCTS survey data from 2011

Subgroup		Guatemala			El Salvador			Honduras			Nicaragua			Costa Rica			Panama		
		Est	Min	Max	Est	Min	Max	Est	Min	Max	Est	Min	Max	Est	Min	Max	Est	Min	Max
Male	H	58.7%	56.8%	60.6%	45.0%	42.8%	47.2%	57.7%	55.9%	59.5%	42.7%	41.3%	44.2%	25.2%	23.3%	27.1%	18.4%	17.1%	19.7%
	A	59.5%	59.2%	59.8%	59.4%	59.0%	59.8%	60.0%	59.6%	60.4%	58.8%	58.4%	59.2%	59.6%	59.0%	60.2%	58.7%	58.0%	59.4%
	M0	0.35	0.34	0.36	0.27	0.25	0.28	0.35	0.34	0.36	0.25	0.24	0.26	0.15	0.14	0.16	0.11	0.1	0.12
Female	H	62.6%	60.3%	64.9%	58.1%	55.1%	61.1%	59.7%	56.3%	63.1%	48.8%	46.7%	50.9%	30.4%	28.0%	32.8%	24.3%	22.4%	26.2%
	A	61.3%	60.7%	61.9%	59.6%	59.1%	60.1%	61.3%	60.8%	61.8%	61.3%	60.7%	61.9%	60.4%	59.5%	61.3%	59.5%	58.7%	60.3%
	M0	0.38	0.37	0.4	0.35	0.33	0.36	0.37	0.34	0.39	0.3	0.29	0.31	0.18	0.17	0.2	0.14	0.13	0.16
Urban	H	53.2%	51.4%	55.0%	44.8%	42.3%	47.3%	51.5%	48.7%	54.4%	45.6%	43.8%	47.4%	24.8%	23.1%	26.5%	19.6%	18.2%	21.0%
	A	61.4%	61.0%	61.8%	59.9%	59.5%	60.3%	61.7%	61.2%	62.2%	61.1%	60.5%	61.7%	60.8%	60.0%	61.6%	59.2%	58.7%	59.7%
	M0	0.33	0.32	0.34	0.27	0.25	0.28	0.32	0.3	0.33	0.28	0.27	0.29	0.15	0.14	0.16	0.12	0.11	0.12
Rural	H	71.5%	69.5%	73.5%	63.0%	61.1%	64.9%	67.8%	65.9%	69.7%	45.8%	44.1%	47.5%	31.8%	29.3%	34.3%	22.8%	21.1%	24.5%
	A	58.8%	58.4%	59.2%	58.8%	58.3%	59.3%	59.5%	59.0%	60.0%	58.4%	57.9%	58.9%	59.0%	58.2%	59.8%	58.9%	57.8%	60.0%
	M0	0.42	0.41	0.43	0.37	0.36	0.38	0.4	0.39	0.42	0.27	0.26	0.28	0.19	0.17	0.2	0.13	0.12	0.14
Ages: 18–33	H	63.1%	61.2%	65.0%	53.8%	50.3%	57.3%	59.4%	56.7%	62.1%	49.6%	47.5%	51.7%	33.5%	31.1%	35.9%	24.7%	22.8%	26.7%
	A	61.5%	61.0%	62.0%	61.7%	61.0%	62.4%	61.4%	60.9%	61.9%	61.6%	60.9%	62.3%	60.8%	60.0%	61.6%	60.6%	59.8%	61.4%
	M0	0.39	0.38	0.4	0.33	0.31	0.35	0.36	0.35	0.38	0.31	0.29	0.32	0.2	0.19	0.22	0.15	0.14	0.16
Ages: 34–49	H	57.5%	55.3%	59.7%	49.0%	46.7%	51.3%	57.1%	54.6%	59.6%	43.0%	41.1%	44.9%	23.2%	21.2%	25.2%	15.9%	14.7%	17.1%
	A	59.1%	58.7%	59.5%	58.4%	58.1%	58.7%	59.5%	59.0%	60.0%	58.8%	58.3%	59.3%	59.8%	59.0%	60.6%	58.4%	57.7%	59.1%
	M0	0.34	0.33	0.35	0.29	0.27	0.3	0.34	0.32	0.36	0.25	0.24	0.26	0.14	0.13	0.15	0.09	0.09	0.1
Ages: 50–65	H	58.5%	55.3%	61.7%	47.8%	45.0%	50.6%	60.4%	57.1%	63.7%	42.6%	39.7%	45.5%	25.0%	22.2%	27.8%	26.6%	23.1%	30.2%
	A	59.5%	58.9%	60.1%	57.7%	57.2%	58.2%	61.2%	60.5%	61.9%	59.4%	58.6%	60.2%	58.0%	56.9%	59.1%	57.0%	55.9%	58.1%
	M0	0.35	0.33	0.37	0.28	0.26	0.29	0.37	0.35	0.39	0.25	0.24	0.27	0.15	0.13	0.16	0.15	0.13	0.17

Table 12 H, A and M0 by Area (Urban and Rural) *Source: Own calculations based on ECCTS survey data from 2011*

		Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panama
Urban	H	53.2%	44.8%	51.5%	45.6%	24.8%	19.6%
		(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.01)
	A	61.4%	59.9%	61.7%	61.1%	60.8%	59.2%
		(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
	M0	0.33	0.27	0.32	0.28	0.15	0.12
		(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Rural	H	71.5%	63.0%	67.8%	45.8%	31.8%	22.8%
		(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
	A	58.8%	58.8%	59.5%	58.4%	59.0%	58.9%
		(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	M0	0.42	0.37	0.4	0.27	0.19	0.13
		(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)

Standard errors in parenthesis

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References

Alaimo, L. S., & Maggino, F. (2020). Sustainable development goals indicators at territorial level: Conceptual and methodological issues—the italian perspective. *Social Indicators Research, 147*(2), 383–419.

Alaimo, L. S. (2020). Synthesis of Multi-indicator System Over Time: A Poset-based Approach. *Social Indicators Research*. https://doi.org/10.1007/s11205-020-02398-5

Alaimo, L. S., Arcagni, A., Fattore, M., Maggino, F., & Quondamstefano, V. (2020). Measuring equitable and sustainable well-being in italian regions: The non-aggregative approach. *Social Indicators Research*. https://doi.org/10.1007/s11205-020-02388-7

Alkire, S (2007) The missing dimensions of poverty data: An introduction. OPHI Working Paper. https://doi.org/10.1080/13600810701701863

Alkire, S., & Fang, Y. (2019). Dynamics of multidimensional poverty and uni-dimensional income poverty: An evidence of stability analysis from China. *Social Indicators Research*. https://doi.org/10.1007/s11205-018-1895-2

Alkire, S., & Foster, J. (2011). Counting and multidimensional poverty measurement. *Journal of Public Economics*. https://doi.org/10.1016/j.jpubeco.2010.11.006
Alkire, S., & Jahan, S. (2018). The New Global MPI 2018: Aligning with the Sustainable Development Goals', HDRO Occasional Paper, United Nations Development Programme (UNDP).
Alkire, S., & Santos, M. E. (2013). A multidimensional approach: poverty measurement & beyond. *Social Indicators Research*. https://doi.org/10.1007/s11205-013-0257-3
Alkire, S., & Seth, S. (2013). Selecting a targeting method to identify BPL households in India. *Social Indicators Research*. https://doi.org/10.1007/s11205-013-0254-6
Alkire, S., Kanagaratnam, U., & Suppa, N. (2018). The Global Multidimensional Poverty Index (MPI): 2018 Revision (No. 46; OPHI Methodologial Notes, p. 59).
Alkire, S., Foster, J., Seth, S., Santos, M. E., Roche, J. M., & Ballón, P. (2015). *Multidimensional Poverty Measurement and Analysis*. Oxford University Press.
Alkire, S., Meinzen-Dick, R., Peterman, A., Quisumbing, A. R., Seymour, G., & Vaz, A. (2013). The women's empowerment in agriculture index. *World Development, 53,* 71–91.
Alkire, S., Santos, M. E., &Yalonetzky, G. (2010). *Is the Multidimensional Poverty Index robust to different weights?* (Working Paper). Oxford Poverty & Human Development Initiative.
Annoni, P., & Brüggemann, R. (2009). Exploring Partial Order of European Countries. *Social Indicators Research, 92*(3), 471–487.
Azevedo, V., & Robles, M. (2013). Multidimensional targeting: identifying beneficiaries of conditional cash transfer programs. *Social Indicators Research*. https://doi.org/10.1007/s11205-013-0255-5
Battiston, D., Cruces, G., Lopez-Calva, L. F., Lugo, M. A., & Santos, M. E. (2013). Income and beyond: multidimensional poverty in Six Latin American Countries. *Social Indicators Research*. https://doi.org/10.1007/s11205-013-0249-3
Belhadj, B. (2012). New weighting scheme for the dimensions in multidimensional poverty indices. *Economics Letters*. https://doi.org/10.1016/j.econlet.2012.03.029
Benavides, F. G., Wesseling, C., Delclos, G. L., Felknor, S., Pinilla, J., & Rodrigo, F. (2014). on behalf of the research team of the first Central American survey of working conditions and health working conditions and health in Central America: a survey of 12 024 workers in six countries. *Occupational and Environmental Medicine*. https://doi.org/10.1136/oemed-2013-101908
Bleys, B. (2012). Beyond GDP: Classifying Alternative Measures for Progress. *Social Indicators Research, 109*(3), 355–376.
Boarini, R., Johansson, A., & Mira d'Ercole, M. (2006). *Alternative Measures of Well-Being* (OECD Social, Employment and Migration Working Papers No. 33).
Burchell, B., Sehnbruch, K., Piasna, A., & Agloni, N. (2014). The quality of employment and decent work: definitions, methodologies, and ongoing debates. *Cambridge Journal of Economics*. https://doi.org/10.1093/cje/bet067
Busso, M., Cristia, J., Hincapie, D., Messina, J., &Ripani, L. (2017). *Learning Better: Public Policy for skills Development*. Washington D.C.: Inter-American Development Bank.
Cárdenas Tomažič, A., Link, F., & Stillerman, J. (Eds.). (2012). *¿Quésignifica el trabajo hoy? cambios y continuidades en unasociedad global* (1st ed.). Catalonia.
Carlsen, L., & Bruggemann, R. (2017). Fragile state index: trends and developments a partial order data analysis. *Social Indicators Research, 133*(1), 1–14. https://doi.org/10.1007/s11205-016-1353-y
Chen, K. M., Leu, C. H., & Wang, T. M. (2019). Measurement and determinants of multidimensional poverty: evidence from Taiwan. *Social Indicators Research*. https://doi.org/10.1007/s11205-019-02118-8
Decancq, K., & Lugo, M. A. (2013). Weights in multidimensional indices of wellbeing: An overview. *Econometric Reviews*. https://doi.org/10.1080/07474938.2012.690641
Duesenberry, J. S.(1949) *Income, saving and the theory of consumer behavior.* Place of publication not identified: Belknap Harvard.
D'Urso, P., Alaimo, L. S., De Giovanni, L., & Massari, R. (2020). Well-Being in the Italian regions over time. *Social Indicators Research*. https://doi.org/10.1007/s11205-020-02384-x
Ervin, P. A., de Ervin, L. G., Vega, J. R. M., & Sacco, F. G. (2018). Multidimensional poverty in Paraguay: Trends from 2000 to 2015. *Social Indicators Research*. https://doi.org/10.1007/s11205-017-1795-x
Ervin, P. A., Gayoso de Ervin, L., Molinas Vega, J. R., & Sacco, F. G. (2018). Multidimensional Poverty in Paraguay: Trends from 2000 to 2015. *Social Indicators Research*. https://doi.org/10.1007/s11205-017-1795-x
Fattore, M. (2016). Partially ordered sets and the measurement of multidimensional ordinal deprivation. *Social Indicators Research, 128*(2), 835–858.
Fattore, M. (2017). Synthesis of Indicators: The Non-aggregative Approach. In F. Maggino (Ed.), *Complexity in Society: From Indicators Construction to their Synthesis* (pp. 193-212). Springer, NewYork

Fattore, M. (2018). Non-aggregated indicators of environmental sustainability. *ŚląskiPrzeglądStatystyczny, 16*(22), 7–22.
Foster, J., & Sen, A. (1997). *Annexe: On Economic Inequality after a Quarter Century* (p. 1997). Oxford University Press.
Galiè, A., Teufel, N., Korir, L., Baltenweck, I., Girard, A. W., Dominguez-Salas, P., &Yount, K. M. (2019). The women's empowerment in livestock index. *Social Indicators Research*. https://doi.org/10.1007/s11205-018-1934-z
Gan, X., Fernandez, I. C., Guo, J., Wilson, M., Zhao, Y., Zhou, B., & Wu, J. (2017). When to use what: Methods for weighting and aggregating sustainability indicators. *Ecological Indicators, 81,* 491–502.
García-Pérez, C., Prieto-Alaiz, M., & Simón, H. (2017). A new multidimensional approach to measuring precarious employment. *Social Indicators Research*. https://doi.org/10.1007/s11205-016-1447-6
Gómez-Salcedo, M., Galvis-Aponte, L., & Royuela, V. (2017). Quality of work life in Colombia: A multidimensional fuzzy indicator. *Social Indicators Research*. https://doi.org/10.1007/s11205-015-1226-9
Green, F., & Mostafa, T. (2012). *Trends in job quality in Europe*. Dublin: Eurofound.
Harrington, J. M. (2001). Health effects of shift work and extended hours of work. *Occupational and Environmental Medicine*. https://doi.org/10.1136/oem.58.1.68
Huneeus, C., Leiva, S., & Micco, A. (2012). *Unemployment Insurance and Search Effort in Chile*. Washington D.C.: IDB Working Paper.
Huneeus, F., Landerretche, O., Puentes, E., & Selman, J. (2015). A multidimensional employment quality index for Brazil, 2002–11. *International Labour Review*. https://doi.org/10.1111/j.1564-913X.2015.00239.x
IADB. (2017). *Learning Better: public policy for skills development*. Inter-American Development Bank.
ILO 2013 Decent Work Indicators: Guidelines for producers and users of statistical and legal framework indicators (ILO Manual) International Labour Organization
ILO. (2017). *2017 Labour Overview: Latin America and the Caibbean*. ILO Regional Office for Latin America and the Caribbean.
ILO. (2018). *World Employment and Social Outlook – Trends 2018* (Flagship Report).
Inter-American Development Bank (IDB). (2017). *Better Jobs Index: An employment conditions index for Latin America*. Inter-American Development Bank.
Kerber, A., & Bruggemann, R. (2015). Problem driven evaluation of chemical compounds and its exploration. *MATCH Communications in Mathematical and in Computer Chemistry., 73,* 577–618.
Kim, H. (2019). Beyond monetary poverty analysis: The dynamics of multidimensional child poverty in developing countries. *Social Indicators Research*. https://doi.org/10.1007/s11205-018-1878-3
Lawton, L. (2010). *Work-Family Balance*. Family Structure and Family-Friendly Employer Programs.
Leschke, J., & Watt, A. (2014). Challenges in constructing a multi-dimensional european job quality index. *Social Indicators Research*. https://doi.org/10.1007/s11205-013-0405-9
Leturcq, M., & Panico, L. (2019). The long-term effects of parental separation on childhood multidimensional deprivation: A lifecourse approach. *Social Indicators Research*. https://doi.org/10.1007/s11205-018-02060-1
Lugo, A. (2007). Employment: A Proposal for Internationally Comparable Indicators. *Oxford Development Studies., 35*(4), 361–378.
Moore, J. C., Stinson, L. L., & Welniak, E. J. (2000). Income measurement error in surveys: A Review. *Journal of Official Statistics., 16*(4), 331–362.
Muñoz de Bustillo, R., Fernández-Macías, E., Antón, J., & Esteve, F. (2009). *Indicators of job quality in the European Union*. European Parliament.
Nussbaum, M. (2003). Capabilities as fundamental entitlements: Sen and social justice. *Feminist Economics, 9*(2–3), 33–59. https://doi.org/10.1080/1354570022000077926
OECD 2014 OECD Employment Outlook 2014 Organisation for Economic Co-operation and Development
OECD 2015 OECD employment outlook 2015 Organisation for Economic Co-operation and Development
Ortega, A. (2013). Defining a Multidimensional Index of Decent Work for Mexico. *Mexican Journal of Economics and Finance*.
Ozughalu, U. M., & Ogwumike, F. O. (2019). Extreme Energy Poverty Incidence and Determinants in Nigeria: A Multidimensional Approach. *Social Indicators Research*. https://doi.org/10.1007/s11205-018-1954-8
Pham, A. T. Q., & Mukhopadhaya, P. (2018). Measurement of poverty in multiple Dimensions: The Case of Vietnam. *Social Indicators Research*. https://doi.org/10.1007/s11205-017-1691-4
Piasna, A., Sehnbruch, K., & Burchel, B. (2019). Job quality in european employment policy: One step forward, two steps back. *The European Review of Labour and Research Transfer*. https://doi.org/10.1177/1024258919832213

Posso, C. M. (2010). Calidad del empleo y segmentación laboral: un análisis para el mercado laboral colombiano 2001–2006. Revista Desarrollo y Sociedad, Universidad de los Andes - CEDE, February.
Ramos, J., Sehnbruch, K., & Weller, J. (2015). Quality of employment in Latin America: Theory and evidence. *International Labour Review*, *154*(2), 171–194.
Royuela, V., López-Tamayo, J., & Suriñach, J. (2008). The institutional vs. the academic definition of the quality of work life What is the focus of the European Commission? *Social Indicators Research, 86*(3), 401–415.
Sehnbruch, K. (2006). *The Chilean Labor Market A Key to Understanding Latin American Labor Markets.* https://doi.org/10.1057/9781403983640
Sehnbruch, K., Burchell, B., Agloni, N., & Piasna, A. (2015). Human Development and decent work: Why some concepts succeed and others fail to make an impact: human development and decent work. *Development and Change*. https://doi.org/10.1111/dech.12149
Sehnbruch, K., González, P., Apablaza, M., Méndez, R., & Arriagada, V. (2020). The quality of employment (QoE) in nine Latin American countries: A multidimensional perspective. *World Development, 127,* 104738.
Sen, A. (1975). *Employment, Technology, and Development*. Clarendon Press.
Sen, A. (1984). The living standard. *Oxford Economic Papers*. https://doi.org/10.1093/oxfordjournals.oep.a041662
Sen, A. (1992). *Inequality reexamined* (Reprint.). New York: Oxford Univ. Press.
Sen, A. (1997). *On Economic Inequality*. Oxford University Press.
Sen, A. (1999). *Development as freedom* (1. ed., 6th print.). New York: Knopf.
Soffia, M. (2018). *Tackling the truly 'bad jobs': scope and limitations of a capability-based measure of job quality in Central America* (PhD Thesis). University of Cambridge, Cambridge.
Tsiboe, F., Zereyesus, Y. A., Popp, J. S., & Osei, E. (2018). The effect of women's empowerment in agriculture on household nutrition and food poverty in Northern Ghana. *Social Indicators Research*. https://doi.org/10.1007/s11205-017-1659-4
UNDP 2016 Human Development Report 2016: Human Development for Everyone United Nations Development Programme
UNDP 2019 Human Development Report 2019: Beyond Income, Beyond Averages, Beyond Today - Inequalities in Human Development in the 21st Century UN
United Nations. (2015). *Transforming Our World: The 2030 Agenda for Sustainable Development* Springer, NewYork
Ura, K., Alkire, S., Zangmo, T, and Wangdi, K. (2012). *An Extensive Analysis of The Gross National Happiness Index*. Centre of Bhutan Studies.
Villacís, A., & Reis, M. (2016). Análisis de la vulnerabilidad laboral y los determinantes del trabajo decente. El caso de Ecuador 2008–2011. Revista de Economía del Rosario.
World Bank. (2016). *Monitoring Global Poverty: Global Report of the Commission on Global Poverty*. World Bank Publications.

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