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**Country-Specific Conditions for Work
and Family Reconciliation:
An Attempt at Quantification**

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Nr 31, rok 2013

Abstract

The country-specific conditions for work and family reconciliation have been theoretically and empirically acknowledged to constitute important determinants of fertility and women's employment. So far, however, there have been very few attempts to quantify these conditions into a single measure which would allow for comparisons across countries of the magnitude of the barriers encountered by working parents. The lack of such a quantitative index precludes the rigorous quantitative testing of the impact of the country-specific conditions for work and family reconciliation on women's fertility and employment behaviors. It also leaves researchers with no option other than to conduct simplistic analyses in which family policies or attitudinal regimes are linked with the outcomes of women's fertility and employment choices in a descriptive manner. In this paper, we seek to fill this gap by proposing a quantitative index of conditions for work and family reconciliation (ICWFR). The index takes into account family policy measures, labor market structures, and gender norms that have been theoretically argued and empirically shown to be relevant for women's fertility and employment choices. We also perform a series of uncertainty and sensitivity analyses which verify the robustness of the ICWFR to our assumptions, and which illustrate the range of the index volatility.

Keywords: women's employment, fertility, family policies, gender norms, labor market structures, index, uncertainty analysis, sensitivity analysis

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1. Introduction

The country-specific conditions for work and family reconciliation (CWFR) have been theoretically and empirically acknowledged to constitute important determinants of fertility and women's employment (Esping-Andersen 2009; Esping-Andersen & Billari 2012; McDonald 2000a, 2000b; Rindfuss & Brewster 1996). By affecting the opportunity costs of childbearing and working for pay, they define the extent to which parenthood restricts the employment opportunities of parents, and to which involvement in the labor market hinders family formation. The cross-country differences in CWFR—which are reflected in a variety of family policies, labor market structures, and gender norms—are usually cited in explanations for the reversal in the cross-country correlation between fertility and women's labor supply in industrialized countries from negative in the 1970s to positive in the late 1980s (Ahn & Mira 2002; D'Addio & d'Ercole 2005; Engelhardt, Kogel & Prskawetz 2004; Kögel 2004; Rindfuss & Brewster 1996). These macro-level studies have argued that women's employment and fertility are higher in countries where combining work and family is more institutionally supported and socially accepted, and where the labor market structures have adjusted to accommodate female labor (i.e., in the Nordic countries) than in countries where women's employment opportunities are severely restricted by having children (e.g., in Southern Europe). A similar conclusion was drawn on the basis of micro-level data by Matysiak and Vignoli (2008). They found that the relationship between women's employment and fertility is still negative in most of the industrialized countries, but that the magnitude of this negative relationship clearly differs between countries, ranging from insignificant in the North of Europe to strongly negative in the South.

Because of the importance of the CWFR for women's employment and fertility, and because these conditions are highly relevant to policy decisions, many attempts have been made in the literature to describe and assess the CWFR in industrialized countries. These studies have generally consisted of a detailed analysis of a certain dimension of the CWFR, most often family policies, upon which a classification of countries was proposed. Based on the results of these analyses, various family policy regimes (Anttonen & Sipilä 1996; Bettio & Plantenga 2004; Gornick, Meyers & Ross 1997; Korpi 2000; Letablier 1998; Lewis & Ostner 1995; Thévenon 2011; Trifiletti 1999) or gender role attitudinal regimes (Lück & Hofäcker 2003; Muszyńska 2007; Philipov 2008; Treas & Widmer 2000) have been put forward. These country typologies have been further juxtaposed with data on women's employment and fertility levels, which have been used for interpreting empirical findings from comparative

micro-level studies, or have even been employed as nominal variables in regression models, with the goal of investigating the effects of family policy models or gender norm typologies on childbearing and women's employment (Blossfeld & Hofmeister 2006; Blossfeld et al. 2005; Gustafsson & Wetzels 2000; Kenjoh 2005). While they have yielded useful information about the general ideology underpinning the family policy or attitudinal regimes, these typologies have not, however, provided us with information about the absolute magnitude of the barriers experienced by parents in combining work and family in a given country, or about the relative standing of the country in the area of work-family reconciliation. For example, various family policy typologies clustered the Anglo-Saxon and the German-speaking countries separately based on the different ideologies underpinning the organization of their welfare states (Esping-Andersen 1990, 1999; Gauthier 1996; Korpi 2000). None of these classifications is, however, able to tell us in which of these two country groups it is easier to combine work and family. This kind of information can be only provided by a quantitative indicator that assesses the CWFR. Such an indicator would also be useful to researchers conducting in-depth investigations of the impact of the CWFR on women's childbearing and employment behaviors, as it would make it possible to compute the effect of the "easiness" of combining the two roles in a given country on women's fertility and occupational choices.

Despite the obvious benefits of compiling a quantitative index assessing the CWFR, there have, to the best of our knowledge, been very few attempts to propose such a measure. Gornick, Meyers and Ross (1997) and Gornick and Meyers (2003) are among the first scholars to advance this idea. Their index of public support of employment for mothers measured the level of public support provided to working mothers, and thus allowed them to construct a country ranking of these levels. Unfortunately, this index has some shortcomings. First, it only covers family policies, and does not take into account labor market structures or gender norms. Second, it includes data on only 12 OECD countries. Third, the authors make a priori assumptions about the weights they used to aggregate its components. Finally, using the arithmetic mean as an aggregation method, they established a linear relationship between the index and its components, and assumed a full compensability between the various family policy fields. A more general index measuring the degrees of incompatibility between work and family, proposed by Matysiak (2011), took into account not only the family policies, but also the labor market structures and the gender norms. The index was computed for the enlarged EU. However, like Gornick et al. (1997) and Gornick and Meyers (2003), Matysiak (2011) also made some a priori assumptions about the aggregation weights, and used the arithmetic mean to aggregate the data.

This paper has two objectives. First, we develop a conceptual model of the CWFR. Second, we summarize this model into a quantitative index of conditions for work and family reconciliation (ICWFR). The proposed index has several advantages over the indices described above. First, it takes into account the three components of the CWFR that have been theoretically argued and empirically shown to be relevant for women's fertility and employment choices: family policy measures, labor market regulations, and gender norms. Second, in order to aggregate the data we use a method which relaxes the assumption of full compensability and allows for a non-linear relationship to be established between the index and its components. Third, the advantage of our approach is that we perform uncertainty and sensitivity analyses of the index for the assumptions made. Although the construction of our index also involves making a series of a priori assumptions, which is always the case to some extent in the construction of a synthetic indicator, the uncertainty and sensitivity analyses provide some insight into the scale of the influence these assumptions have on the index scores.

The ICWFR is computed for the EU member states and Norway. This selection of countries was driven purely by the availability of comparable statistical indicators. There are, however, no other obstacles to extending the index to other countries in future research.

In the next section, we develop the conceptual framework of the CWFR. We then describe the data used and the methodology applied. In our section on empirical findings, we present the index scores for the analyzed countries, and discuss the sensitivity of the index to the assumptions made. This section also provides a simple test of the criterion validity, which relies on juxtaposing the ICWFR with the adjusted total fertility rate and the labor force participation rate of women. We conclude by outlining the possibilities for the application of the index in studies on fertility and women's employment, and by discussing the limitations of the index and the opportunities for its further extension.

2. Country-specific conditions for work and family reconciliation: a conceptualization

The demographic and socioeconomic literature have identified three main groups of macro factors that affect the CWFR: (1) family policies, such as public childcare provision and parental leave mandates for women and men (Esping-Andersen 2009; Gauthier 1996; Neyer 2003); (2) labor market structures, including the flexibility of working hours and the employment protection legislation that affect the costs of firing and hiring (Aaberge et al. 2005; Adsera 2004, 2005; Ahn & Mira 2002; Del Boca 2002); and the (3) social norms

regarding men's and women's roles (Goldscheider, Oláh & Puur 2010; Liefbroer & Corijn 1999; Muszyńska 2007; Puur et al. 2008). We briefly present below the major theoretical arguments for the effects of these three groups of factors on fertility and women's labor supply, and supplement them with a review of the relevant empirical studies. Based on these considerations, we will then propose a conceptual scheme of the CWFR.

2.1. Family policies

For the purposes of the current paper, we focus only on the family policies designed to support work and family reconciliation; i.e., childcare services and childcare leave entitlements for both mothers and fathers. These policies constitute an important dimension of *family policy-related conditions for work and family reconciliation*, as they offer parents a broad spectrum of complementary opportunities for combining work and family. Specifically, leave policies allow parents to withdraw from the labor market to care for a very young child without terminating their job contract, whereas childcare services facilitate the parents' return to work after taking the leave.

Childcare services

From a theoretical point of view, there are at least two reasons to believe the provision of childcare services is an effective instrument that facilitates the reconciliation of paid work and family life. First, an improvement in the availability of childcare services reduces the opportunity costs of parenting, which should lead to an increase in the demand for children. Second, a greater availability of childcare leads to a reduction in the mother's reservation wage, and thus is expected to encourage mothers to return to the labor market earlier.

The positive impact of childcare provision on women's employment has been widely documented in the literature (Blau & Robins 1991; Connelly 1992; De Henau, Meulders & O'Dorchai 2011; Del Boca 2002; Gustafsson & Stafford 1992; Kimmel 1995; Leibowitz, Klerman & Waite 1992; Mason & Kuhlthau 1992; Michalopoulos, Robins & Garfinkel 1992; Powell 1998; Ribar 1992; Rønsen & Sundström 2002; Stolzenberg & Waite 1984). The effect of childcare provision on fertility seems to be more mixed. For instance, Blau and Robins (1991), Del Boca (2002) and Del Boca, Pasqua and Pronzato (2009) found that childcare availability had a positive impact on fertility, whereas Hank and Kreyenfeld (2003) and Andersson, Duvander and Hank (2004) found that it had no significant effect, and Ronsen (2004) even found that having access to childcare had a negative impact on childbearing. One problem with these studies is, however, that they treat childcare availability as exogenous to

fertility. The newest studies, which account for this problem, have shown unequivocally that having access to public childcare facilitates childbearing, affecting both tempo (Baizan 2009; Rindfuss et al. 2007) and completed fertility (Rindfuss et al. 2010).

The availability of childcare facilities is most often measured by either coverage rates or enrolment rates. It is also influenced by the cost of childcare services for parents, the opening hours of facilities, and the number of childcare slots. In addition, the quality of childcare services is often seen as an important determinant of childcare use. Thus, an ideal indicator of the level of public support for childcare services should take into account the number of places available, the average opening hours of care institutions, the cost of childcare services for parents, as well as the quality of the service.

Childcare leaves

In contrast to childcare services, which enable parents to spend more time at work, leave benefits give parents the opportunity to withdraw temporarily from economic activity without terminating their employment contract. There are various types of leave that may be claimed by parents: maternity leave directed at mothers; paternity leave directed at fathers; parental leave directed at both parents, although usually used by women; and the “daddy quota,” which is the portion of the parental leave entitlement reserved exclusively for fathers. The impact of maternity and parental leave entitlements on women’s employment depends on the length of the leave and of related benefit. Generally, well-paid but short leave entitlements are considered to have no negative impact on women’s employment levels, or to even increase them. There are several reasons why this is the case. First, women may be more likely to enter employment if they know they can take leave if they have child (Hofferth & Curtin 2006). Second, the leaves shield mothers from a potential job loss, and hence reduces the amount of time spent out of work (Pylkkanen & Smith 2003). Finally, shorter career breaks are less likely than longer breaks to have a negative impact on women’s human capital (Baker & Milligan 2005; Evertsson & Duvander 2011). Empirical research conducted in the U.S. in the late 1980s and 1990s, where not all new mothers were entitled to maternity leave, provided evidence consistent with these arguments. These studies showed that mothers with leave benefits returned to work faster than women whose employment was terminated when they had a child (Berger & Waldfogel 2004; Hofferth & Curtin 2006; Klerman & Leibowitz 1999; Waldfogel, Higuchi & Abe 1999). Nonetheless, longer leaves may decrease women’s employment and earning prospects due to substantial losses in human capital (Mincer & Polachek 1974). Empirical research has generally confirmed the non-monotonic relationship

between the duration of the leave and women's employment (Baker & Milligan 2005; De Henau, Meulders & O'Dorchai 2011; Evertsson & Duvander 2011; Pettit & Hook 2005; Rønsen & Sundström 2002). While these studies have clearly shown that taking a four- to five-month child-related career break (corresponding in practice to maternity leave) is not detrimental to a woman's employment career, there is no agreement about the optimal duration of parental leave, which may differ according to the country context, the woman's orientation toward work, and the number of career interruptions she experiences over the life course (Galtry & Callister 2005).

Maternity and parental leave provisions are expected to reduce the opportunity costs of parenting by providing women with a guarantee that they can return to their job after having a child. Thus, these leave entitlements should stimulate fertility. In general, empirical research has shown that it is not the duration of the leave, but the amount of compensation provided and the payment conditions of the parental leave benefit which are most influential for childbearing decisions (Thevenon & Gauthier 2011). The clearest examples of the positive effects of parental leave benefits on fertility were found in Sweden (Andersson 1999; Andersson, Hoem & Duvander 2006; Hoem 1993) and Austria (Lalive & Zweimueller 2009), where speed premium systems were built into the parental leave schemes. The introduction of parental allowances was also shown to have had a positive influence on fertility in Finland, Norway, and France; mainly with respect to third births (Aassve & Lappegard 2009; Vikat 2004).

While there has been a considerable amount of research on the impact of leave uptake among women on the fertility and employment choices of women, we know much less about the effects of leave entitlements directed at men. Paternity leave and the daddy quota are relatively new in many countries. They were first introduced in the Nordic countries (in the 1990s). From the beginning, they offered benefits with high replacement rates (80%-90% of the remuneration prior to the leave), which is thought to constitute an important incentive for men to use the leave (O'Brien 2009).

In general, the greater involvement of men in childcare is expected to reduce the care burden on women, and thus to facilitate fertility and/or women's return to the labor market (Esping-Andersen 2009; Esping-Andersen & Billari 2012; McDonald 2000a, 2000b). The few studies on the impact of parental leave uptake by men on fertility that were conducted in the Scandinavian context have provided evidence consistent with this expectation. They showed that couples in which the father took the leave after the first child was born were more likely to have a second child (Duvander & Andersson 2006; Duvander, Lappegard & Andersson

2010). Moreover, a father's use of the leave was demonstrated to be positively related to his later involvement in childcare (Brandth & Kvande 2009; Haas & Hwang 2008; Seward et al. 2006). However, the obtained effects do not appear to be causal, as these studies did not account for a selection of family-oriented fathers into the use of parental leave.

While there are still some unresolved issues regarding the effects of childcare leaves on women's employment and fertility, we can generally conclude that the most important characteristics of childcare leave entitlements that affect the reconciliation of work and family are the length of the leave, the compensation rate, and whether the leave is designed to be taken by mothers only, or by both mothers and fathers.

2.2. Labor market structures

Two characteristics of labor markets, the flexibility of work arrangements and the magnitude of the barriers to labor market entry, are particularly important determinants of women's fertility and labor market behaviors. By influencing women's opportunities to enter the labor market, to maintain employment, and to combine work with family duties, these characteristics define the extent to which the labor market has adjusted to accommodate female labor; or, in other words, they determine the country-specific *labor market-related conditions for work and family reconciliation*. This dimension of the CWFR has rarely been discussed separately in the literature. Researchers have usually focused only on the level of access to part-time employment in a given country. The barriers to labor market entry have usually been treated as a consequence of welfare regulations, and have therefore been discussed as integral to the welfare regime (Esping-Andersen 1999). It was not until recently, in the 2000s, that the role of labor market rigidity was highlighted by fertility researchers. In particular, researchers in Southern Europe linked the low childbearing rates in that region to high female and youth unemployment, high firing and hiring costs, and the precariousness of employment among new labor market entrants (Aaberge et al. 2005, pp. 131-5; Adserà 2004; Adserà 2005; Bettio & Plantenga 2004; Billari 2004; Del Boca 2002; Vignoli, Drefahl & De Santis 2012).

Flexibility of working hours

The flexibility of working hours has been widely recognized in the literature as an important factor contributing to work-family tensions among women (Gornick & Heron 2006; OECD 2011; Plantenga et al. 2009). However, the empirical research conducted so far has mainly focused on the effects of the availability of part-time jobs on women's employment

and fertility, as well as on the effects of women's participation in part-time employment on women's childbearing behavior. These studies have generally shown that the availability of part-time jobs tends to increase female labor force participation (Aaberge et al. 2005; Del Boca 2002; Jaumotte 2003), although research has also indicated that part-time employment can lower a woman's career prospects in terms of wages and occupational position (Hegewisch & Gornick 2011; O'Reilly & Bothfeld 2002; OECD 1999; Walsh 2007), and can lead to employment with non-standard hours (Gornick & Heron 2006).

When it comes to fertility, the empirical evidence has been less consistent. While some studies have found positive effects of working reduced hours on the probability of having a child (Baizan 2005 for Italy, Spain and the UK; Berkowitz King 2005; Corijn 2001; Liefbroer 2005; Liefbroer & Corijn 1999; Schmitt 2012 for the UK), others have found no significant relationship (Baizan 2005 for Denmark; Kreyenfeld 2001; Kreyenfeld 2005; Oláh 2003; Schmitt 2012 for Germany). This inconsistency in the findings has been attributed in the literature to cross-country differences in the quality of part-time jobs, based on levels of job protection, hourly wages, and access to social benefits (Begall & Mills 2011; Del Boca, Pasqua & Pronzato 2009).

Work flexibility can be achieved not only through part-time employment, but also by granting parents more control over their working lives, including the hours of work and the location where the work is performed. To the best of our knowledge, there are no studies that have evaluated the effects of control over the schedule and location of work on women's employment or fertility. Studies conducted by organizational psychologists have, however, demonstrated that giving parents the option of adjusting their working hours in order to meet their family obligations (Allen & Shockley 2009; Byron 2005; Hill et al. 2010; Kelly, Moen & Tranby 2011) or of working from home (Gajendran & Harrison 2007) can reduce the work-family conflict.

Barriers to labor market entry

The barriers to labor market entry are strongest in countries characterized by strong employment protection, usually through restrictive legislation on the hiring and firing of workers or strong unionization. Various forms of employment protection can, for example, determine the costs of hiring and firing both permanent and temporary workers, the rules for employing disadvantaged groups, levels of severance pay, and the requirements for individual and collective dismissals (OECD 2004). Strict employment protection leads to the emergence of dual labor markets, in which employed insiders have protected permanent positions, while

unemployed and temporarily employed outsiders have great difficulties finding secure work. Consequently, employment protection has a positive influence on the employment opportunities of prime-aged men, who benefit from the reduction in the chances they will be laid off, but lowers the employment prospects of labor market entrants or of individuals who take temporary employment breaks, especially young people and women. These observations have been widely confirmed by empirical research (Bertola, Blau & Kahn 2007; Heckman & Pagés-Serra 2000; Kahn 2007, 2012).

Employment protection not only hinders women in returning to paid employment after a child-related career break, it also limits women in realizing their fertility intentions (Aaberge et al. 2005; Adserà 2004, pp. 131-5; Adserà 2005). In this vein, Adserà (2004) and Rovny (2011) showed that strong employment protection legislation is indeed negatively related to total fertility. Fogli (2004) demonstrated that it leads young adults to postpone leaving the parental home, and Adserà (2005, 2011) provided evidence that high gender unemployment gaps and long-term unemployment produced by the insider-outsider divide substantially slow down the progression to third births. Although empirical research on the impact of employment protection legislation on fertility is scarce, the theoretical arguments and evidence provided so far seem to suggest that, by jeopardizing women's employment prospects after a career break, employment protection legislation is an important determinant of the country-specific conditions for work and family reconciliation.

2.3. Gender norms

In addition to family policies and labor market structures, individual behavior is also influenced by broad ideologies and norms regarding the “correct” division of unpaid household labor and paid market work between women and men that dominate in a given society (Pfau-Effinger 1998, 2000). By assigning certain responsibilities to women and men, these norms define which of the two partners in a couple is mainly responsible for working for pay, and which is mainly responsible for taking care of the children. Thus, these norms help to determine the country-specific *culture-related conditions for work and family reconciliation* (Liefbroer & Corijn 1999; Muszyńska 2007). These conditions are worst in societies that have a low acceptance of employment among mothers, particularly among mothers of small children.

An important issue that can arise in investigating the effects of gender norms on fertility and women's employment is how the concept of gender norms is measured (Davis & Greenstein 2009; Goldscheider, Oláh & Puur 2010; Mills 2010; Neyer, Lappegard & Vignoli

2011; Westoff & Higgins 2009). Questions about gender are asked differently in various surveys, and there is no commonly accepted conceptual model of gender norms. Thus, they are operationalized differently from one study to another, and are usually a product of exploratory multivariate statistical techniques.

Because of these problems with the conceptualization and operationalization of gender norms, as well as a shortage of panel surveys that include appropriate questions, empirical studies testing the effects of gender norms on fertility and women's employment are relatively scarce. Nevertheless, those which are available have generally shown that more egalitarian gender norms are positively linked with women's labor market outcomes in terms of employment (Cunningham 2008; Fortin 2005), number of working hours (Corrigall & Konrad 2007; Cunningham et al. 2005; Fortin 2005), and wages (Christie-Mizell 2006; Christie-Mizell et al. 2007). In addition, egalitarian gender ideology seems to reduce the gender wage gap (Fortin 2005). Egalitarian gender norms have also been shown to have positive effects on family formation. For instance, Gimenez-Nadal, Molina and Sevilla-Sanz (2012) and Sevilla-Sanz (2010), using two different datasets, found that egalitarian gender norms increase the probability of forming a union. Meanwhile, Puur et al. (2008) established a positive link between men's fertility intentions and egalitarian gender role attitudes regarding responsibilities for domestic tasks and childrearing. It is, however, noteworthy that the effect of egalitarian gender ideology on fertility seems to be positive if it refers to gender equality at home, such as to the division of housework and care responsibilities; but is negative if it refers to gender equality in the public sphere, such as to employment or political life (Goldscheider, Oláh & Puur 2010; Westoff & Higgins 2009).

2.4. A conceptual scheme

Based on the theoretical considerations and the review of empirical studies presented above, we see the CWFR as a product of three dimensions: family policies, labor market structures, and gender norms. Of the family policies, we consider those that determine childcare services (in terms of number of places, quality, opening hours, and costs) as well as childcare leaves for both women and men as the most crucial for work-family reconciliation. The labor market dimension of the CWFR covers flexible working hours, such as the option of working reduced hours or of having control over one's work schedule; and barriers to labor market entry, usually in the form of employment protection regulations. Finally, culture-related conditions for work and family reconciliation encompass gender norms that govern the

division of household and paid labor between partners. The conceptual scheme of the CWFR we developed is presented in Figure 1.

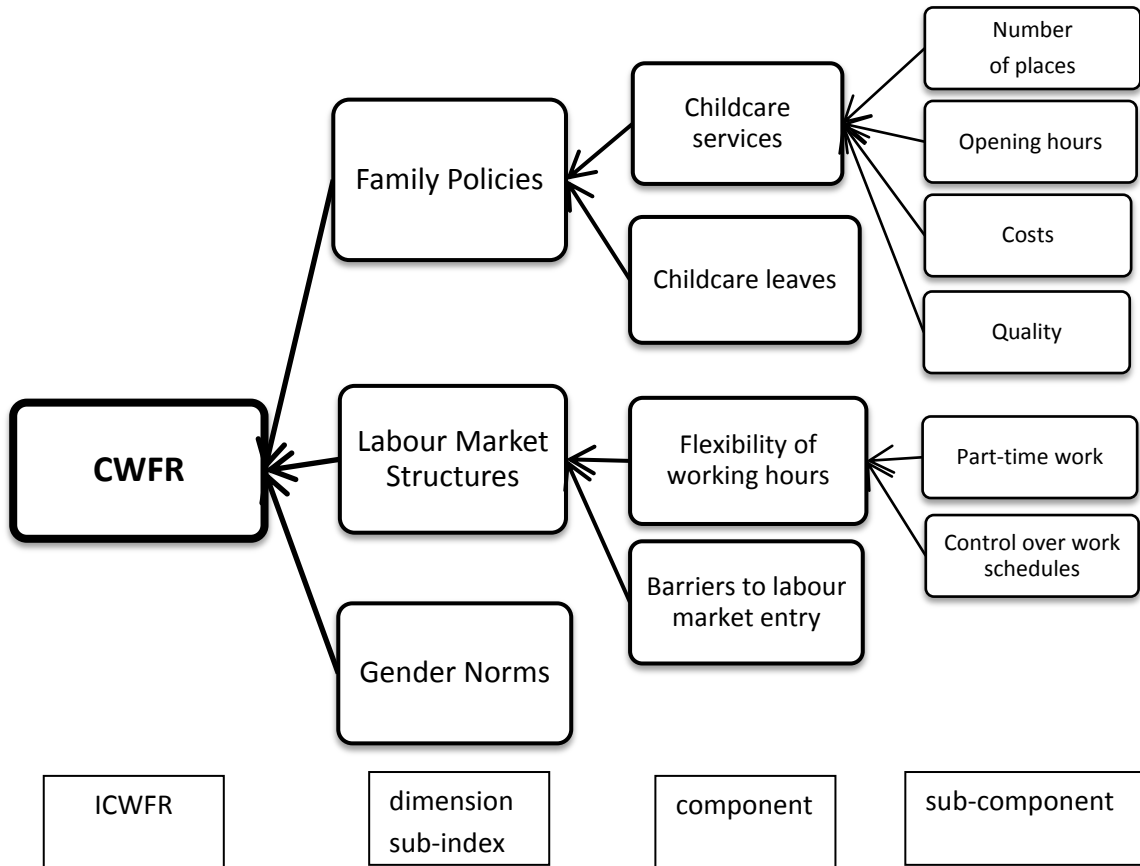


Figure 1. Conceptual scheme of the country-specific conditions for work and family reconciliation (CWFR)

This conceptual scheme constitutes a basis for the construction of the ICWFR. The index is composed of three sub-indexes: the family policy index (FPI), the labor market structure index (LMSI), and the gender norms index (GNI), each of which is constructed using certain components (for example, the family policy sub-index is made up of childcare services and childcare leaves). The components can be further made up of sub-components (e.g., the sub-components of childcare services are the number of places in childcare institutions, the opening hours of childcare institutions, the cost of childcare services for parents, and the quality of the childcare services). Given this structure, we claim that the ICWFR has a formative character (Bagozzi 2007; Bollen 2007; Howell, Breivik & Wilcox 2007).

Several important assumptions must be made at this stage of the construction of the ICWFR. The first is regarding the compensability of the elements of the scheme. Can a country's poor performance in one of the CWFR dimensions be fully compensated for by a

good performance in another dimension? Although there are no specific studies on this topic, we argue that the assumption of full compensability is wrong. For example, implementing work-family reconciliation policies in a country with traditional gender norms may not have the same effects as in a country with egalitarian gender norms, as individuals who adhere to a family model based on role specialization may be less likely to take advantage of reconciliation measures. Likewise, offering parents generous parental leave entitlements cannot compensate for the shortage of childcare services, as childcare leave is generally taken by parents of very young children, and is fully used only by those parents who wish to take a longer child-related career break. Thus, to encourage women to have children and to continue their professional careers, it is crucial that all of the dimensions of the CWFR, including all of the components and the sub-components, are improved equally.

The sensitivity of the ICWFR to changes in its dimensions, components, and sub-components is the second issue that requires consideration. For example, does an expansion of childcare services improve the conditions of working parents more in countries where these services are poor, or in countries where they are already well developed? In our opinion, the improvement in the CWFR should be larger in countries where the shortage in a given dimension, component, or subcomponent undergoing a change is larger than in a country where the majority of the barriers to working parents related to this dimension, component, or subcomponent had already been eliminated. Thus, for the purposes of the construction of the ICWFR, we assume that the relationship between the ICWFR and its dimensions, components, and sub-components is non-linear, favoring greater improvements in those index components which are underdeveloped.

Finally, we need to make certain assumptions about the relative importance of the elements of the scheme for the CWFR. Are the three dimensions of the CWFR equally important? Likewise, are the components of each dimension equally important? To the best of our knowledge, there has been no research on the relative importance of the various factors affecting the CWFR which could guide us in establishing the aggregation weights. In this paper, we thus assume that family policies, labor market structures, and gender norms weigh equally on the CWFR, as we have no grounds to assume diverse weights. Similar assumptions are made regarding the components within each dimension and the sub-components. The influence of the assumptions on compensability, the sensitivity of the ICWFR to changes in its components, and the relative importance of the sub-indexes and components of ICWFR on ICWFR scores are tested in the empirical part of the paper.

3. Data

The main criteria that guided our data search were data reliability, relevance with respect to the concept measured, timeliness, and wide coverage of countries. With these objectives in mind, we consulted several international databases. We then selected five different datasets which provided most of the statistical indicators we needed.

For quantifying the family policy dimension, we mainly referred to the Multilinks Database on Intergenerational Policy Indicators for Family Policies (Keck, Hessel & Saraceno 2009). This database is rich in various childcare indicators, and hence provided us with data on childcare coverage, legally guaranteed entitlement to public childcare, and the opening hours of childcare centers for all of the EU member states. It was also our source for data on the duration and compensation rates of childcare leave for women and men. On the basis of these data, we constructed leave indicators measuring leave duration in full-time equivalents available to mothers and fathers. These indicators were used in our further computations. Additionally, we used the OECD Family Database, which provided us with data on the cost of childcare services for parents. Unfortunately, we were not able to identify a database with information on the quality of childcare services for a majority of the countries covered by our study. Thus, this sub-component of the ICWFR was not considered in our final computations.

The labor market data for the labor market structures dimension mainly came from the Eurostat Statistics Database. This source provided us with information on part-time employment, and on individual control over the work schedule. These data were collected through the survey “Reconciliation between work and family life” conducted in 2005 in all of EU member states as a module of the Labour Force Survey. Additionally, we consulted the OECD Employment Database to gather data on employment protection legislation.

Finally, the information on gender norms was obtained from the European Value Study (2008), which asks a battery of questions on attitudes toward the involvement of women and men in paid employment, family care, and housework.

Our final choices of statistical indicators, together with the associated data sources, the relationship of each indicator to the ICWFR, and the time period covered, are presented in Table 1 of the appendix. The collected indicators refer to the time span ranging from 2003 to 2008, as it was not possible to collect all of the data for the same calendar year. The use of indicators from various years over a five-year time period should not have any substantial effect on the family policy variables, opinion variables, or labor market variables that refer to labor market regulations. This expectation is based on our assumption that family policies, labor market regulations, and opinions do not undergo substantial changes over a short time

period; and that, even if a policy is changed during the period, individuals usually need time to adjust to it. Only labor market outcomes, such as part-time employment, may be expected to change more rapidly. Therefore, we decided to use for our analyses part-time employment data from the mid-point of the time span studied; i.e., from 2005.

One of our objectives in the process of data collection was to cover as many countries as possible. We succeeded in covering 26 countries: 25 EU countries and Norway. Two EU countries, Malta and Cyprus, were excluded due to the relatively high number of missing values.

Some missing values also were observed for the remaining countries. To impute them we proceeded in two steps. First, for the country-level data we took the data from the previous year available. This left us with only nine cases of missing data. All of them applied to the family policies. Four cases occurred in the CHCOST variable (Bulgaria, Italy, Romania, Slovenia), two cases in the CHHOURS_35 variable (Bulgaria, Greece), and one case in the COVER_03 variable (Romania). These missing data were imputed in the second step using the nearest neighbor (based on the remaining quantitative variables of the family policies dimension) hot deck method (Little & Rubin 2002) with the Manhattan distance metric (Saisana 2010). The pairs of the most similar countries were as follows: Bulgaria and Hungary, Romania and Hungary, Italy and Spain, Slovenia and Latvia, and Greece and Poland.

4. Method

First, we performed an operationalization of our conceptual model of the CWFR by verifying and exploring the underlying structure of our data. The verification was conducted for the components of the family policies and labor market structures dimensions, while the exploration was conducted for the gender norms dimension. As we believe our index has a formative rather than a reflective character, either a principal component analysis (PCA) or a nonlinear principal component analysis (nonlinear PCA) was employed, depending on the variable character (continuous or dichotomous). Regardless of the method applied, our criteria for component extraction were based on the eigenvalues level (Keiser criterion), the amount of variance explained, and the pattern of PC loadings. The resulting operationalization scheme of the ICWFR is presented in Section 5.1. It is noteworthy that we used PCA only for confirming and modifying our conceptual model, and not for computing the scores for sub-components, as doing so would mean that we had accepted the compensability among variables.

Second, we aggregated variables into sub-components, sub-components into components, components into sub-indexes, and sub-indexes into the ICWFR. To this end, we employed a generalized mean with power $q < 1$. In contrast to the arithmetic mean, which was used in previous studies attempting to quantify the CWFR (see Gornick, Meyers and Ross (1997), Matysiak (2011)), this aggregation technique ensures that there is no possibility of the full compensation of low results in one component or dimension with high results in others (Decancq & Lugo 2013; Ruiz 2011). It also ensures that a rise in the lower tail of distribution of any variable will improve the composite indicator more than a similar increase in the upper tail, which means it is inequality adverse (Ruiz 2011). Such an approach is in line with the assumptions of our conceptual model. It also corresponds to recent developments in the field; it was used for computing the Human Development Index (HDI) as of 2010 (Klugman, Rodriguez & Choi 2011) and the Material Condition Index proposed by Ruiz (2011) for the OECD. For the purposes of our study, we opted for the generalized mean of power $q = 0.5$, which is between the arithmetic mean (a generalized mean with a power equal to one) and the geometric mean (a generalized mean with a power equal to zero). The latter is also inequality adverse, and does not provide full compensability. We feared, however, that the penalization on compensability it imposes and the extent to which it rewards improvements in low scores would be too high. The influence of this strong assumption on the results was verified through the uncertainty and sensitivity analyses.

The aggregation was performed on standardized variables (with weighted averages and standard deviations in order to account for the country's population size (Annoni & Kozlovska 2011)), which were also shifted in order to be positive in line with the requirements of the applied aggregation method. In the aggregation process, we applied an equal weighting scheme, which means that we assumed that all of the sub-components weigh equally on each component, all of the components weigh equally on each sub-index, and all three of the sub-indexes weigh equally on the ICWFR. The final weights assumed are presented on the operationalization scheme (Figure 2) in Section 5.1.

Finally, we performed the uncertainty analysis and the sensitivity analysis in order to assess the robustness of the ICWFR with regard to all of the normative assumptions made during the conceptualization process; namely, assumptions regarding the non-full compensability, the non-linear relationship between the index and its components, and the equal weighting (see Section 2.4). The aim of the uncertainty analysis was to measure the overall possible variation in the ICWFR scores resulting from the uncertainty linked to the

assumptions made. The aim of the sensitivity analysis was to determine which of the assumptions influenced the scores the most.

In order to verify the assumption regarding the rate of non-full compensability and the strength of the non-linear relationship between the index and its components, we modified the power of the generalized mean, which was allowed to range from $\langle 0.2; 1 \rangle$. The assumption on equal weighting was tested by assuming weights at the sub-index and the component levels that ranged $\pm 20\%$ of the reference weight. The two uncertain factors, the power of the generalized mean and the weights, were sampled simultaneously in a quasi-random sampling scheme (Sobol' 1976), with a base sample of $n=6,000$ in order to capture all of the possible interaction effects among the assumptions made. In the uncertainty analysis, the simulated indexes were compared with the reference index. The final score is therefore presented with the uncertainty expressed by the error terms.

In the sensitivity analysis, we used Sobol's sensitivity indices: the first-order effect S_i (Saltelli, Tarantola & Campolongo 2000; Sobol' 1993) and the total effect S_{Ti} (Homma & Saltelli 1996; Saltelli et al. 2010). The first-order effects S_i tell us what proportion of the variance in the ICWFR was caused by the uncertainty factors. However, these indexes do not take interactions involving the uncertainty factors into account. Therefore, we also computed the total effects S_{Ti} , which tell us about the overall influence of the uncertainty factors on the composite, including the interactions (Homma & Saltelli 1996). In our analysis, we considered the uncertainty factor to have an important influence on the composite indicator if it explained at least $1/n * 100\%$ of the variance in the composite indicator, where n is a number of uncertain factors (Saisana, Saltelli & Tarantola 2005).

5. Results

5.1. Operationalization scheme

According to our conceptualization scheme presented in Figure 1, the family policies dimension consists of two components: childcare services and childcare leave. Only the structure of the first component was verified, as the second component was measured with only two variables, MLEAVE and FLEAVE, which precluded performing the PCA. The structure of childcare services was not confirmed in our data, as we obtained a two- instead of a three-dimensional solution (Table 2 in the appendix). The first sub-component turned out to consist mainly of indicators for childcare coverage and the legally guaranteed entitlement to childcare. It thus describes accessibility to childcare in terms of the number of childcare places. We call this sub-component childcare supply. The second sub-component, although

affected by childcare coverage for the youngest children and entitlements guaranteed for children aged 0-3, is made up mostly of indicators for the opening hours of childcare institutions and their costs. It thus defines selectivity in access to childcare: shorter opening hours hinder access to childcare for parents who work longer or have atypical working schedules, while higher childcare costs limit the options for using childcare by poorer social strata. Consequently, we called this sub-component selectivity in access to childcare. Overall, the two sub-components explain 57.6% of the variance present in the data (30.14% and 27.43% for the first and second nonlinear PC, respectively).

Conceptually, the labor market structures dimension consists of two components: (1) the flexibility of working hours and (2) barriers to labor market entry. This conceptualization was confirmed by the PCA. Two principal components (PC) were extracted, as two eigenvalues exceeded one. The first PC, corresponding to the flexibility of working hours, was loaded by three variables: the proportion of women in part-time employment, the proportion of women who cannot take whole days off for family reasons without using the leave, and the proportion of women who cannot vary the start/end of the working day for family reasons (see Table 3 in the appendix). The second PC, corresponding to barriers to labor market entry, was loaded by the EPL variable. The signs of the PC loadings were in line with the expected orientation of the variable towards the ICWFR. The variance explained accounted for 51.15% and 25.22% (summed 76.37%) for the first and second PC, respectively.

The gender norms dimension has no conceptual scheme. In this case, we performed an exploratory analysis on all five indicators, populating this dimension to reveal its components. It appeared that only one eigenvalue exceeded one, and that the level of explained variance by the first PC amounted to 61.96%. This means that the values assumed by the GN1-GN5 variables were driven by one latent variable that describes social norms regarding parents' involvement in childcare, including social norms regarding women's participation in paid employment, women's participation in childcare, and men's participation in childcare (see

Table 4 in the appendix).

Overall, the multivariate analyses we performed led us to the operationalization scheme of the ICWFR displayed in Figure 2. The figure also presents the variables we used for the measurement of its elements and the weights employed for aggregation (given in brackets). It largely corresponds to the conceptualization scheme presented in Figure 1, except

for the slight change in the operationalization of the childcare services component and the operationalization of the gender norms dimension that we developed.

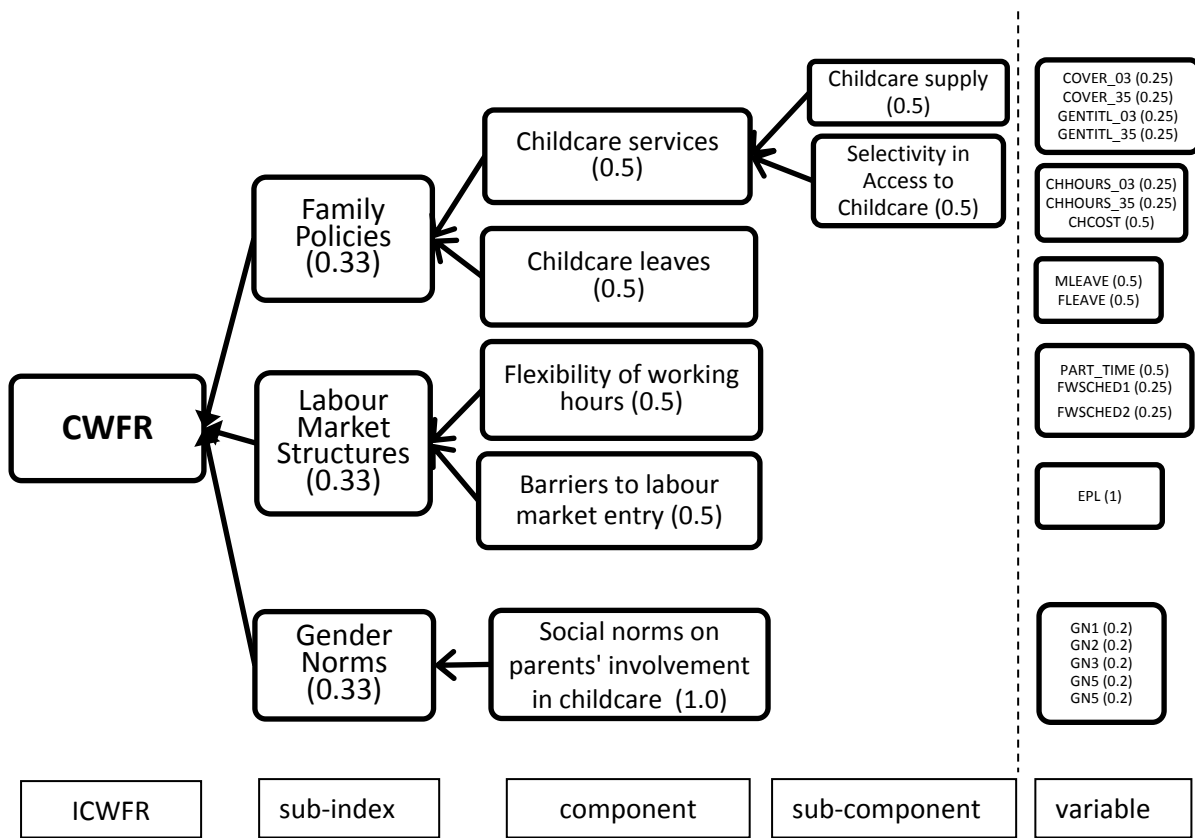


Figure 2. Operationalization scheme of the ICWFR

Note: Aggregation weights are given in brackets.

5.2. Index scores

Following the operationalization scheme, we computed the ICWFR and the three sub-indices—FPI, LMSI, and GNI—for 25 EU member states and Norway. The index scores, normalized by min-max normalization, are presented in Figure 3 - Figure 6. The raw scores with the associated standard errors are presented in Table 5 in the appendix. The scores are always oriented as the higher, the better.

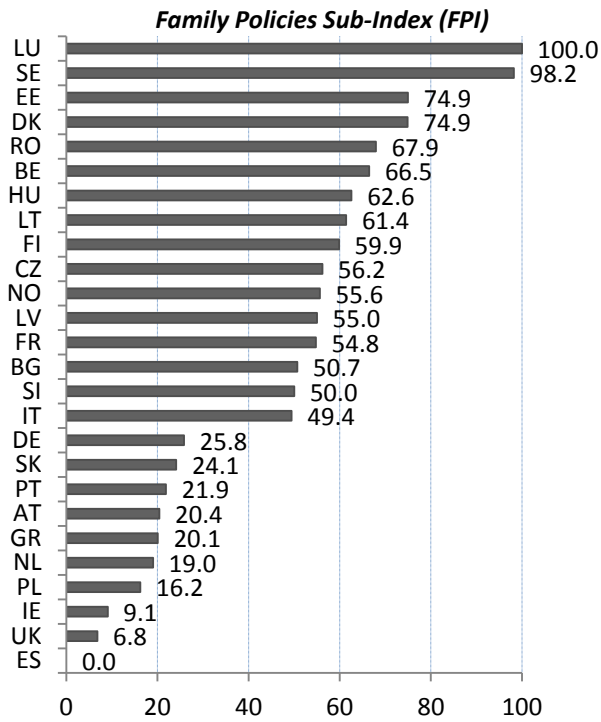


Figure 3. Family Policies Sub-Index based on normalized values.

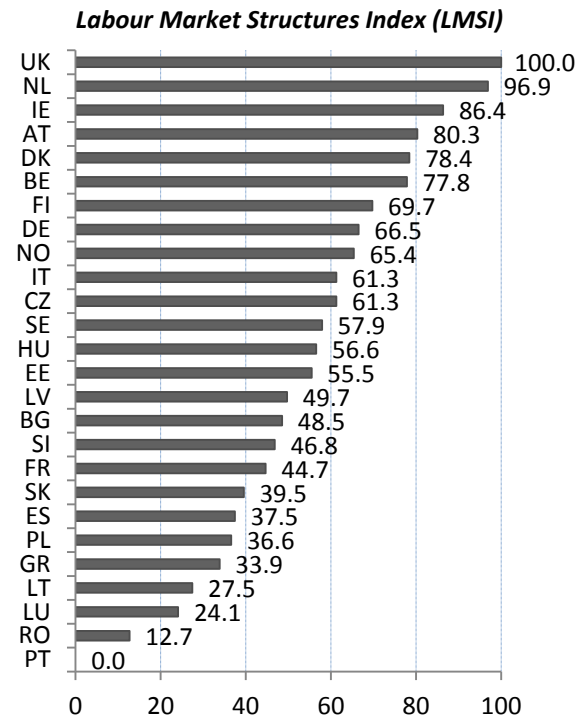


Figure 4. Labor Market Structures Sub-Index based on normalized values.

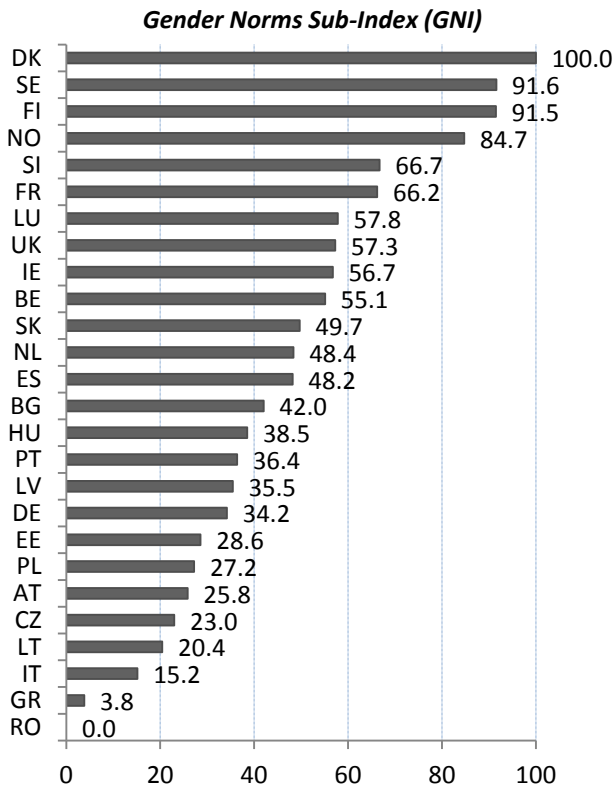


Figure 5. Gender norm sub-index based on normalized values.

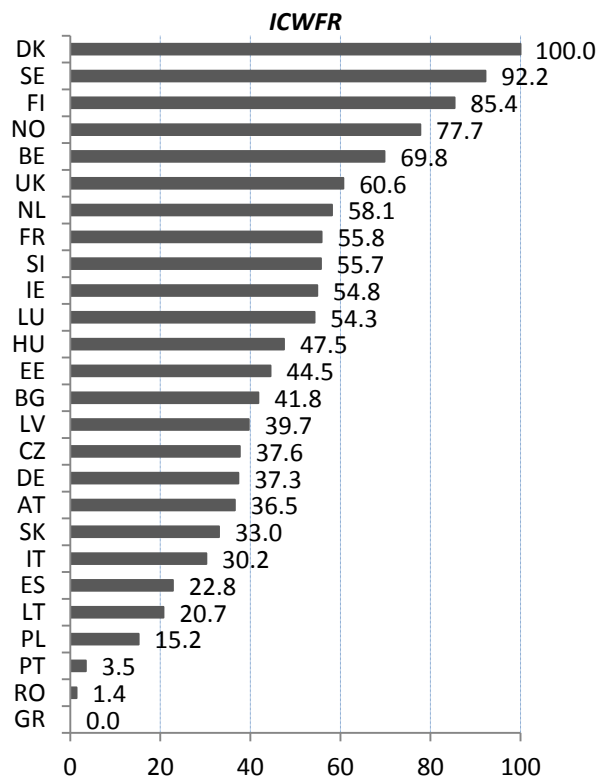


Figure 6. Index of conditions for work and family reconciliation based on normalized values.

According to the FPI, the family policy-related CWFR are definitely the best in Luxembourg and Sweden (Figure 3). The high position of Luxembourg is mainly due to the relatively long and well-paid leaves for men (six months with a compensation rate of 67%). In Sweden, the leave entitlement is shorter, but childcare provision is better. Good family policy-related CWFR were also found in Denmark, Belgium, some of the post-socialist countries (Estonia, Romania, Hungary, and Lithuania), and Finland. It should be noted that the high positions of Romania and Lithuania are due to long and well-paid parental leave entitlements, while the situation in the remaining countries is more balanced between childcare supply and the provision of leave entitlements. Moderate family policy-related conditions, with FPI normalized scores of between 45 and 55, were found in the Czech Republic, Norway, Latvia, France, Bulgaria, Slovenia, and Italy. The Czech Republic and Bulgaria earned relatively high positions due to long and well-paid leave entitlements, while Italy scored high due to long daddy quotas. The remaining countries scored moderately on both the childcare and the leave variables. Much poorer CWFR were found in the German-speaking countries (Austria and Germany), the Southern European countries (Greece, Portugal, Spain), the Anglo-Saxon countries (Ireland and the United Kingdom), and the two remaining post-socialist countries (Poland and Slovakia). Out of these countries, the situations were the worst in Spain, Ireland, and the United Kingdom.

The good family policy-related CWFR do not necessarily coincide with good labor market-related conditions. In fact, the four countries—the United Kingdom, the Netherlands, Ireland, and Austria—which scored lowest on the family policy dimension were found to offer the best labor market-related CWFR (Figure 4). While the Netherlands and Austria earned their high positions mainly due to a high degree of flexibility in working hours, the United Kingdom and Ireland scored high because they have relatively weak employment protection legislation. The remaining positions in the ranking are, according to the LMSI, occupied by Denmark, Belgium, Finland, Germany, Norway, Italy, and the Czech Republic. The worst labor market-related CWFR were found in the Southern European countries, apart from Italy and the Central and Eastern European (CEE) countries. The bottom positions in the country ranking are occupied by Portugal, followed by Romania, Luxembourg, Lithuania, Greece, Poland, Spain, and Slovakia. Although post-socialist countries and Southern European countries are both characterized by strong employment protection legislation and rigid working hours, strong employment protection is a much greater problem in Mediterranean Europe, while the working hours are more rigid in CEE.

Finally, the culture-related CWFR, as measured by the GNI, were found to be by far the best in the Nordic countries (Denmark, Sweden, Finland, and Norway), followed by Slovenia and France (Figure 5). The middle positions are occupied by Luxembourg, the United Kingdom, Ireland, Belgium, Slovakia, the Netherlands, and Spain. The rest of the country positions, according to the GNI, are occupied by the remaining post-socialist countries, the remaining Southern European countries, as well as the German-speaking countries. Of these countries, the culture-related conditions were found to be better in Bulgaria, Hungary, Portugal, Latvia, and Germany; worse in Estonia, Poland, Austria, the Czech Republic, Lithuania, and Italy; and by far the worst in Greece and Romania.

These three types of CWFR—i.e., family policy-related, labor market-related, and culture-related—describe the general setting for combining paid work and care, as measured by the ICWFR. This setting is unequivocally the best in the Nordic countries, with Denmark strongly in the lead, followed by Sweden, Finland, and Norway. These results are not surprising, as the Nordic countries scored very high on at least two dimensions of the CWFR; namely, the family policy-related and the culture-related dimensions. The Nordic countries are followed by Belgium and the United Kingdom. Belgium holds a relatively high position in the ranking because it offers relatively good family policies and flexible working hours, as well as moderate culture-related CWFR. The United Kingdom fails in the provision of policies supporting the reconciliation of work and care, but it is characterized by flexible working hours, low employment protection, and gender norms that are quite supportive of the equal division of labor between women and men. Quite good to moderate conditions for combining work and care were found in the Netherlands, France, Slovenia, Ireland, Luxembourg, and Hungary. The Netherlands holds a relatively good position in the ICWFR because it has the most flexible working hours in the EU, but it fails in the provision of reconciliation policies. In Luxembourg, France, and Slovenia, reconciliation policies and gender norms are quite supportive to very supportive of working mothers, but the labor market structures are not. Conversely, Ireland scored very high on the LMSI, but very low on the FPI. Somewhat worse CWFR than in the countries mentioned above were found in four post-socialist countries (Estonia, Bulgaria, Latvia, and the Czech Republic) and in the two German-speaking countries (Germany and Austria). At the bottom of the ranking are four post-socialist countries (Slovakia, Lithuania, Poland, and Romania) and all four Southern European countries (Italy, Spain, Portugal, and Greece), of which Portugal, Romania, and Greece are definitely the worst. It is noteworthy that Greece was found to have poor CWFR on all three of the dimensions considered.

5.3. Results of the uncertainty analysis and the sensitivity analysis

The median simulated scores for the ICWFR, FPI, LMSI, and GNI were almost the same as the reference scores (see the last four columns in Table 5 in the appendix). Furthermore, the reference scores were always within an interval defined by p5 and p95 simulated scores; and the standard deviations of the simulated scores accounted for at most 2.9%, 2.1%, 2.4%, and 3.7% of the reference scores for the FPI, LMSI, GNI, and ICWFR, respectively. This implies that there is not much uncertainty related to the ICWFR or to any of its sub-indexes. It also shows that the ICWFR, despite having been computed with normatively assigned weights and the power of the generalized mean, represents a non-biased indicator of country-specific conditions for work and family reconciliation.

Among all of the assumptions made, the weights assigned to the FPI, the LMSI, and the GNI were the most influential on the ICWFR scores (see Table 6 in Appendix). They were responsible for 9%, 17%, and 13% of the volatility in the ICWFR, respectively, (without taking interactions between these weights and other weights or power of the generalized mean into account), whereas all of the uncertain factors independently explained 40% of the ICWFR variance. This means that, even though we set each assumption separately during the conceptualization process, the interactions occurring among the uncertainty factors brought about 60% of the whole ICWFR variation. This applied mainly to the power of the generalized mean, which, although it was not influential independently, appeared to contribute considerably to the variation in ICWFR scores through the weights of the sub-indexes. Increased values of S_{Ti} for the power of the generalized mean and the weights attributed to the FPI, the LMSI, and the GNI indicated that the interrelations between the weights at the sub-index level and the power of the generalized mean also mattered.

5.4. Criterion validity

As was shown in Section 5.3, the ICWFR is quite robust to the assumptions we made, and hence should constitute a good indicator of the CWFR. As we noted in the introduction, we anticipated that the CWFR would correlate positively with women's employment and fertility. To verify these relationships, we used the employment rate of women aged 25-49 (EMPR)—i.e., women who were likely to have young children at home—and the total fertility rate adjusted for tempo effects (adjTFR), as our sample includes post-socialist countries, where the process of fertility postponement started relatively late, and has certainly not come to an end. Both of the relationships were shown to be linear and strongly positive (Figures 7

and 8). The cross-country variation in ICWFR explained 34% of the variation in the EMPR and 52% of the variation in the adjTFR. The direction of the correlations was thus consistent with our general knowledge about the relationship between the CWFR and the adjTFR/EMPR.

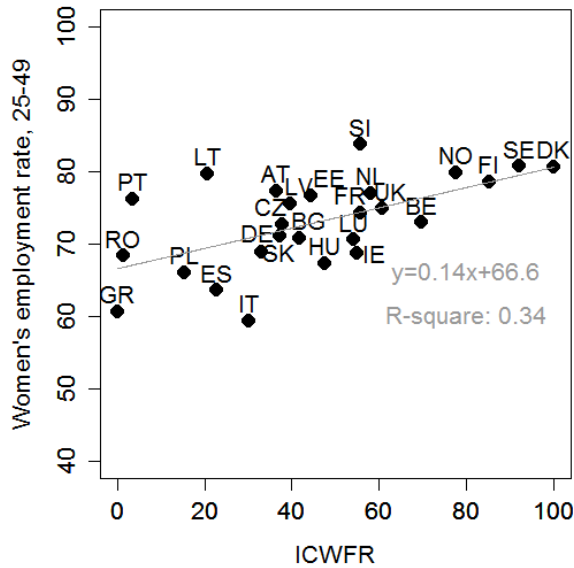


Figure 7. Cross-country correlation between the index of conditions for work and family reconciliation (ICWFR) and employment rate of women (EMPR) aged 25-49, 2005

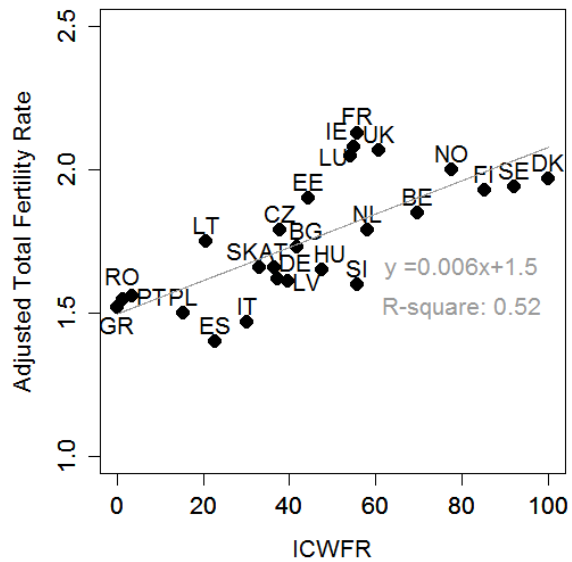


Figure 8. Cross-country correlation between the index of conditions for work and family reconciliation (ICWFR) and the total fertility rate (TFR), 2005

Furthermore, it should be noted that similar correlations were computed between the adjTFR/EMPR and our three sub-indexes (findings not presented here). They were all weaker than the correlations between the adjTFR/EMPR and the ICWFR (except for the correlation between the GNI and the EMPR, which was found to be as strong as the correlation between the ICWFR and the EMPR). This finding supports our multidimensional conceptualization of the ICWFR and confirms that focusing on one dimension only does not fully reflect the difficulties parents face in combining paid work and family.

6. Discussion

In this paper, we attempted to eliminate the shortcomings in the assessment and measurement of the country-specific conditions for work and family reconciliation (CWFR) that we presented in the introduction. We first developed a conceptual model of these

conditions, and then summarized them into a composite indicator which allowed for their quantitative assessment. The proposed index for the conditions for work and family reconciliation (ICWFR) evaluates the environment for combining paid work and care in three dimensions simultaneously: i.e., it takes into account the extent to which work and family reconciliation is supported by family policies, the extent to which it is socially accepted, and the extent to which the labor markets have adjusted to accommodate women's labor.

The ICWFR and the three sub-indexes it is composed of (the family policy index, or FPI; the labor market structures index, or LMSI; and the gender norms index, or GNI) are useful for several reasons. First, they provide us with information about the absolute magnitude of the barriers experienced by parents in combining work and care in a given country, as well as about the relative standing of the country in the area of work-family reconciliation. Second, they should contribute to our knowledge on the effects of the country context on individual behaviors, because due to their quantitative character they allow us to perform a quantitative assessment of the impact of the country-specific environment for combining employment and childrearing on women's fertility and work decisions in a regression framework. An assessment can be made of the overall conditions or of their three dimensions, which means we are able to evaluate the relative importance of family policies, labor market structures, and gender norms for childbearing and women's employment. Such a quantitative assessment of the impact of the CWFR on individual behaviors has so far been hindered by the fact that, while qualitative variables describing either family policy regimes or attitudinal regimes have been available, none of these variables take into account the three dimensions of CWFR simultaneously. Furthermore, the categories of family policy regimes have often overlapped with categories of attitudinal regimes, which has hampered our investigations of the relative importance of the two dimensions of the CWFR. Finally, an important novelty of the ICWFR is that it accounts for the flexibility of working hours and employment protection legislation, factors which have often been disregarded in previous cross-country comparisons of the CWFR.

The ICWFR was computed for the 25 EU member states and Norway, and described the CWFR around the mid-2000s. It indicates that the CWFR is unequivocally the best in the Nordic countries, with Denmark in the leading position, followed by Sweden, Finland, and Norway. Belgium, the United Kingdom, the Netherlands, and France occupy the subsequent positions. These findings are in line with the results cited in the literature, which have consistently indicated that the Nordic countries, Belgium, and France are the European countries where public policies are the most supportive of working parents, and where

mothers' involvement in the labor market is the most socially accepted (Bettio & Plantenga 2004; Esping-Andersen 1999; Gauthier 1996; Gornick, Meyers & Ross 1997; Korpi 2000). The Netherlands has often been praised for its exceptionally flexible working hours (Lewis et al. 2008; Plantenga, Remery & Takacs 2012), and the United Kingdom has been lauded for its low levels of employment protection, which facilitates entry into the labor market after a career-related break (Adserà 2004; Adserà 2005). The ICWFR confirms that the CWFR are poor in Southern Europe, but it also provides information in addition to what was already known about the cross-country distribution of the CWFR: namely, it tells us that conditions in the German-speaking countries are worse than in Anglo-Saxon countries, but are somewhat better than in Southern Europe. Furthermore, it also provides us with information on the CWFR in post-socialist countries of Europe, about which our knowledge has so far been limited. These countries have either been rarely covered by comparative research on public policies and social norms, or clustered together into a single group of post-socialist countries. Thanks to the ICWFR, we have learned that this group is by no means homogenous with respect to the CWFR, but rather displays a strong degree of variation, with Slovenia offering quite good conditions for combining work and care, followed by Hungary, Estonia, Bulgaria, Latvia, and the Czech Republic, where the situation is worse, but is still far better than in Lithuania, Poland, or Romania, which are found at the bottom of the overall ranking.

Until now, only a few attempts to construct a composite indicator of the CWFR have been made. For example, Gornick, Meyers and Ross (1997) proposed an index of public support of employment for mothers, and Matysiak (2011) constructed an index of the incompatibilities of work and family. Our ICWFR is more advanced than these previously developed indicators in several aspects. First, in contrast to Gornick et al. (1997), it takes into account three dimensions of the CWFR that have been theoretically argued and empirically shown to be relevant for women's fertility and employment choices. Second, unlike previous indexes, it does not assume that shortages in one dimension of CWFR can be fully compensated for with surpluses in another dimension. Instead, it treats these dimensions as complementary, which is consistent with the view that investing in one dimension of CWFR is less efficient in terms of improving the overall CWFR than undertaking actions which improve the three dimensions in parallel. Third, while previous approaches assumed linear relationships between the overall index and its components, our ICWFR is more sensitive to changes in those dimensions, components, and sub-components of the CWFR which had been largely unsupportive of work-family reconciliation before the change took place. Finally, although the construction of the index required us to make some a priori assumptions about

the compensation rate and aggregation weights, as was done for the other two indices, we tested the robustness of the ICWFR to these assumptions and performed a sensitivity analysis to assess the importance of their influence on the index scores. The index turned out to be robust to the assumptions made. However, the importance of the sub-index weights and power of the generalized mean, shown in the sensitivity analysis, indicated that process of weight assignment should not be considered trivial, and that the rate of compensability matters.

Despite these advances, the index we developed also has some limitations. First, the conceptual model of the ICWFR relies largely on the available empirical research on CWFR. Although this research has been developing rapidly in recent years, and is applying increasingly sophisticated data and methods, it is still far from perfect. Above all, the existing research failed to provide us with some of the information needed for the construction of the index. It also could not guide us in establishing aggregation weights or the compensability rate. Moreover, we lacked sufficient information on the optimal duration of childcare leave from the perspective of encouraging both fertility and women's employment. These failures led us to formulate certain a priori assumptions. In particular, we applied the equal weighting scheme and a moderate compensability rate, and assumed a linear relationship between leave duration and the work-family conflict. Another important flaw of the available empirical research is that it often failed to account for selection problems, and the outcomes it produced represent correlations between certain elements of the CWFR and fertility or women's employment, rather than causal effects. These results, if biased, could have led us to choose the wrong indicators in the construction of the index. In order to minimize this risk, we formulated our conceptual model on the basis of a literature review which was as comprehensive as possible, taking care to include the most recent studies, which were based on higher quality data and applied more advanced methods.

Another drawback of our study is that we were only able to compute the ICWFR for one time period and only for EU member states and Norway, as we lacked access to time series of comparable indicators characterizing family policies, labor market structures, and gender norms. However, computing the ICWFR for a longer time period and a larger number of countries would enhance any future dynamic cross-country comparative analyses of the impact of the CWFR on women's fertility and employment behaviors, and would contribute to our knowledge of the importance of these conditions for fertility and women's employment on an even larger scale than is currently possible.

Against this background, our study has clear implications for future research. First, it calls for further empirical studies on the impact of various elements of CWFR on fertility and

women's employment, which would eliminate the failures and gaps in our knowledge, as noted above. Second, further improvements should be made in the availability of complete and reliable time series of CWFR indicators that are internationally comparable. Such indicators could be used to extend the coverage of the ICWFR over time and space. Finally, in-depth empirical research, most likely employing individual-level data and multi-level modeling, is needed; first to test the usefulness of the ICWFR, and second to investigate the importance of the country context for women's employment and fertility behaviors.

ACKNOWLEDGEMENTS

The authors contributed to the paper equally, and are listed alphabetically. The work of Anna Matysiak was financially supported from the research project "Family Change and Subjective Well-Being" (FAMWELL), financed by the National Centre for Research and Development under the Lider program. The paper benefited substantially from comments and suggestions made by Anna Baranowska-Rataj, Monika Mynarska, Michela Nardo, Andrea Saltelli, and Marta Styrac.

7. Appendix

Table 1. List of variables used for ICWFR construction.

Component	Variable name	Description (orientation towards ICWFR)	Time period	Source
FAMILY POLICIES DIMENSION				
Childcare services	COVER_03	Coverage rate for children under 3 years old (positive)	2004	Multilinks
	GENTITL_03	Guaranteed entitlement to childcare services for children under 2 years old (positive)	2004	Multilinks
	COVER_35	Coverage rate for children aged 3-5 (positive)	2004	Multilinks
	GENTITL_35	Guaranteed entitlement to childcare services for children aged 3-5 (positive)	2004	Multilinks
	CHHOURS_03	Average hours of attendance to childcare per week (children aged 0-2) (positive)	2008	OECD
	CHHOURS_35	Opening hours for pre-primary education (positive)	2004	Multilinks
	CHCOST	Childcare fees per 2-year old in % of average wage, 2004 (negative)	2004	OECD
Childcare leaves	MLEAVE	Maternity and parental ¹ leave in full-time equivalents (i.e., leave duration multiplied by the income replacement rate of the respective leave benefit) (positive)	2004	Multilinks
	FLEAVE	Paternity and parental leave reserved for fathers in full-time equivalents (positive)	2004	Multilinks
LABOUR MARKET STRUVTURE DIMENSION				
Flexibility of working hours	FWSCHED1	% of people who cannot take whole days off for family reasons without using the leave among women aged 25-49 (negative)	2005	Eurostat
	FWSCHED2	% of people who cannot vary start/end of working day for family reasons among women aged 25-49 (negative)	2005	Eurostat
	PART_TIME	Part-time employment as percentage of the total employment of women aged 25-49 (%) (positive; 0.5)	2005	Eurostat
Barriers to labor market entry	EPL	Indicator of overall employment protection legislation (negative)	2003	OECD
GENDER NORM DIMENSION				
Components to be extracted at the stage of exploration and verification of the data structure	GN1	% of people who agree or strongly agree with the statement that a working mother can establish just as warm and secure a relationship with her child as a mother who does not work (positive)	2008	European Value Study
	GN2	% of people who disagree or strongly disagree with the statement that a pre-school child is likely to suffer if his or her mother works (positive)	2008	European Value Study
	GN3	% of people who disagree or strongly disagree with the statement that a job is all right, but what most women really want is a home and children (positive)	2008	European Value Study

¹ The part of the parental leave reserved for fathers is not included.

	GN4	% of people who agree or strongly agree with the statement that, in general, fathers are as well-suited to look after their children as mothers (positive)	2008	European Value Study
	GN5	% of people who agree or strongly agree with the statement that men should take as much responsibility as women for the home and children (positive)	2008	European Value Study

Table 2. Pattern of principal component loadings in the two-dimensional nonlinear PCA for the childcare services component.

Variable	Sub-component 1 - Childcare supply	Sub-component 2 - Selectivity in access to childcare
COVER_03	0.667	0.526
CHHOURS_03		0.749
COVER_35	0.902	
CHHOURS_35		0.741
CHCOST		-0.454
GENTITL_03	0.562	0.566
GENTITL_35	0.493	

* Only factor loadings above 0.4 are reported

Table 3. Pattern of PC loadings in the two-dimensional PCA solution for labor market structures component.

Variable	Component 1 - Flexibility of working hours	Component 2 - Barriers to labor market entry
PART_TIME	0.717	
FWSCHED1	-0.924	
FWSCHED2	-0.819	
EPL		-0.989

* Only factor loadings above 0.4 are reported

Table 4. Pattern of PC loadings in the one-dimensional PCA solution for the gender norms dimension.

Variable	Component 1 - Social norms on parents' involvement in childcare
GN1	0.743
GN2	0.887
GN3	0.779
GN4	0.823
GN5	0.690

Table 5. Index of conditions for work and family reconciliation (ICWFR) and its sub-indexes – raw scores, raw scores±SD, normalized scores and medians of simulated raw scores.

Country	Raw scores				Raw score ±SD				Normalized scores				Median simulated raw score			
	FPI	LMSI	GNI	ICWFR	FPI	LMSI	GNI	ICWFR	FPI	LMSI	GNI	ICWFR	FPI	LMSI	GNI	ICWFR
AT	4.706	5.581	4.432	4.894	(4.706; 4.707)	(5.58; 5.582)	(4.431; 4.432)	(4.892; 4.896)	20.41	80.30	25.84	36.55	4.706	5.581	4.432	4.894
BE	5.576	5.514	5.453	5.514	(5.575; 5.576)	(5.512; 5.515)	(5.453; 5.453)	(5.513; 5.515)	66.45	77.85	55.11	69.78	5.576	5.514	5.453	5.514
BG	5.278	4.710	4.996	4.992	(5.277; 5.279)	(4.708; 4.712)	(4.996; 4.997)	(4.991; 4.993)	50.69	48.55	42.02	41.79	5.278	4.710	4.996	4.992
CZ	5.382	5.060	4.332	4.915	(5.381; 5.384)	(5.058; 5.061)	(4.332; 4.333)	(4.913; 4.917)	56.20	61.30	23.00	37.64	5.382	5.060	4.332	4.915
DK	5.735	5.530	7.020	6.078	(5.734; 5.736)	(5.529; 5.531)	(7.019; 7.02)	(6.075; 6.08)	74.89	78.45	100.00	100.00	5.735	5.530	7.020	6.078
EE	5.736	4.900	4.528	5.042	(5.736; 5.737)	(4.899; 4.901)	(4.528; 4.528)	(5.04; 5.044)	74.95	55.48	28.59	44.48	5.736	4.900	4.528	5.042
FI	5.451	5.291	6.723	5.805	(5.451; 5.452)	(5.291; 5.292)	(6.723; 6.723)	(5.802; 5.807)	59.85	69.74	91.49	85.36	5.451	5.291	6.723	5.805
FR	5.355	4.604	5.840	5.254	(5.355; 5.355)	(4.603; 4.605)	(5.84; 5.841)	(5.252; 5.256)	54.77	44.67	66.21	55.83	5.355	4.604	5.840	5.254
DE	4.808	5.203	4.723	4.909	(4.808; 4.809)	(5.202; 5.204)	(4.723; 4.723)	(4.908; 4.91)	25.81	66.51	34.19	37.35	4.808	5.203	4.723	4.909
GR	4.700	4.308	3.663	4.213	(4.699; 4.701)	(4.307; 4.308)	(3.663; 3.663)	(4.211; 4.214)	20.07	33.89	3.82	0.00	4.700	4.308	3.663	4.213
HU	5.503	4.930	4.874	5.098	(5.502; 5.503)	(4.927; 4.932)	(4.874; 4.874)	(5.097; 5.1)	62.58	56.56	38.51	47.48	5.503	4.930	4.874	5.098
IE	4.493	5.747	5.510	5.236	(4.492; 4.494)	(5.745; 5.749)	(5.51; 5.51)	(5.233; 5.238)	9.10	86.37	56.74	54.85	4.493	5.747	5.510	5.236
IT	5.255	5.060	4.059	4.776	(5.253; 5.256)	(5.06; 5.06)	(4.059; 4.059)	(4.774; 4.778)	49.43	61.30	15.15	30.21	5.255	5.060	4.059	4.776
LV	5.360	4.742	4.767	4.952	(5.359; 5.36)	(4.741; 4.742)	(4.767; 4.767)	(4.951; 4.953)	55.02	49.71	35.45	39.65	5.360	4.742	4.767	4.952
LT	5.480	4.131	4.243	4.599	(5.479; 5.482)	(4.131; 4.132)	(4.242; 4.245)	(4.596; 4.602)	61.40	27.45	20.44	20.71	5.480	4.131	4.243	4.599
LU	6.209	4.040	5.548	5.225	(6.205; 6.214)	(4.038; 4.042)	(5.548; 5.548)	(5.22; 5.229)	100.00	24.12	57.83	54.26	6.209	4.040	5.548	5.225
NL	4.681	6.036	5.218	5.297	(4.68; 4.681)	(6.034; 6.038)	(5.217; 5.218)	(5.295; 5.299)	19.03	96.88	48.37	58.13	4.681	6.036	5.218	5.297
NO	5.372	5.172	6.487	5.662	(5.371; 5.372)	(5.17; 5.173)	(6.487; 6.487)	(5.66; 5.665)	55.64	65.38	84.74	77.74	5.372	5.172	6.487	5.662
PL	4.628	4.382	4.480	4.496	(4.627; 4.629)	(4.38; 4.384)	(4.479; 4.48)	(4.495; 4.497)	16.23	36.58	27.22	15.18	4.628	4.382	4.480	4.496
PT	4.734	3.378	4.799	4.277	(4.733; 4.734)	(3.378; 3.379)	(4.799; 4.799)	(4.275; 4.28)	21.85	0.00	36.37	3.46	4.734	3.378	4.799	4.277
RO	5.603	3.727	3.530	4.239	(5.602; 5.605)	(3.726; 3.728)	(3.528; 3.532)	(4.235; 4.243)	67.92	12.71	0.00	1.40	5.603	3.727	3.530	4.239
SK	4.776	4.463	5.264	4.829	(4.775; 4.777)	(4.461; 4.465)	(5.264; 5.265)	(4.827; 4.831)	24.09	39.54	49.70	33.04	4.776	4.463	5.264	4.829
SI	5.265	4.663	5.858	5.251	(5.265; 5.266)	(4.662; 4.663)	(5.858; 5.859)	(5.249; 5.253)	50.01	46.82	66.72	55.66	5.265	4.663	5.858	5.251
ES	4.321	4.406	5.212	4.638	(4.321; 4.321)	(4.405; 4.407)	(5.212; 5.212)	(4.636; 4.64)	0.00	37.46	48.20	22.80	4.321	4.406	5.212	4.638

SE	6.175	4.967	6.726	5.933	(6.175; 6.176)	(4.967; 4.968)	(6.726; 6.726)	(5.93; 5.936)	98.21	57.93	91.58	92.23	6.175	4.967	6.726	5.933
UK	4.450	6.121	5.529	5.344	(4.449; 4.45)	(6.119; 6.123)	(5.529; 5.529)	(5.341; 5.347)	6.81	100.00	57.28	60.64	4.450	6.121	5.529	5.344

Table 6. Sobol's sensitivity measures of the first-order and the total effect for the summary summarized difference in countries' scores with respect to the reference scenario - ICWFR.

Input factor	ICWFR	
	First-order effect (S_i)	Total effect (S_{Ti})
Power of generalized mean	0.00	0.10
Weight attributed to childcare services	0.00	0.01
Weight attributed to childcare leaves	0.00	0.01
Weight attributed to flexibility of working hours	0.00	0.01
Weight attributed to barriers to labor market entry	0.00	0.01
Weight attributed to FPI	0.09	0.44
Weight attributed to LMSI	0.17	0.53
Weight attributed to GNI	0.13	0.49
SUM	0.40	-

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