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Has the potential for compensating poverty by women's employment growth been depleted?

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Abstract

Although employment growth is propagated as being crucial to reduce poverty across OECD countries, the actual impact of employment growth on poverty rates is still unclear. This study presents novel estimates of the impact of macro-level trends in female labour force participation on trends in poverty, across 15 OECD countries from 1971 to 2013. It does so based on over 2 million household-level observations from the LIS Database, using Blinder-Oaxaca decompositions. This method allows for disentangling the impact of increasing women's employment rates from other possible confounders driving poverty outcomes. The results indicate that an increase of 10 percentage points in the female labour force participation rate was associated with a reduction of 1 percentage point of poverty across these countries. The increase in women's employment has had a significant impact on poverty trends. However, in the Nordic countries no such poverty reducing effect was found, as in these countries womens employment rates were very high and stable throughout the observation period. In countries that initially showed marked increases in women's employment, such as the Netherlands, Germany, Spain, Canada, and the United States, the initial increases in women's employment rates were typically followed by a period in which these trends levelled off. Hence, our findings suggest that the potential of following an employment strategy to reduce poverty in OECD countries has, to a large extent, been depleted.

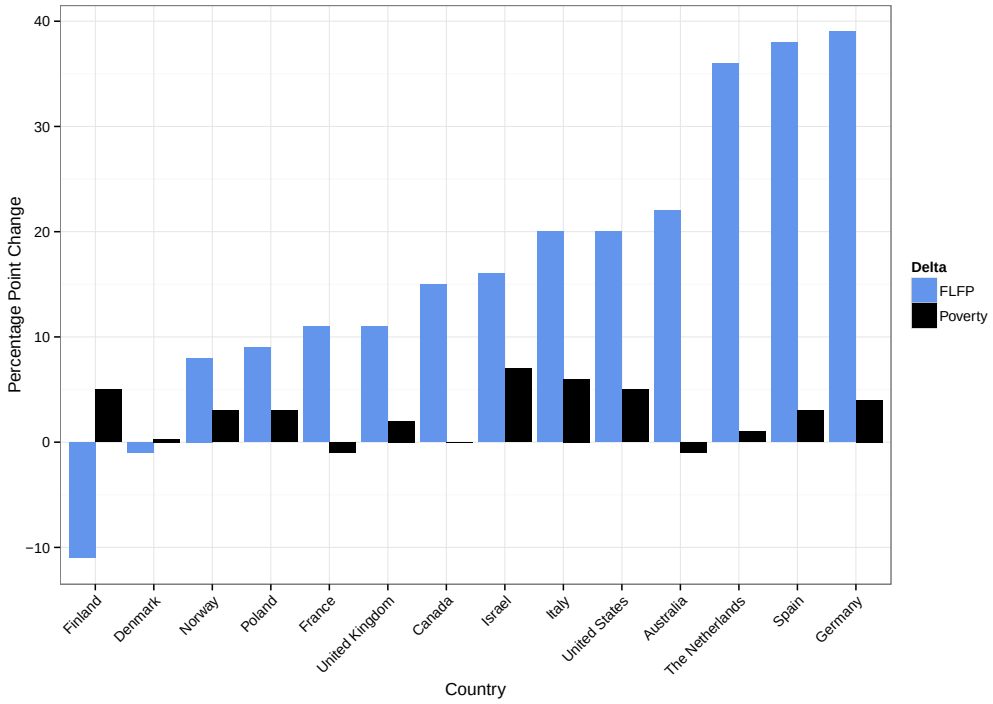
Background and Research Question

Employment growth is regarded one of the most important ways to reduce poverty. In the European Union this is reflected in the 'Social Investment' paradigm of policy making, which emphasises government expenditures on policies that allow people to 'prepare' themselves for economic independence through employment (e.g. education and active labour market policies), rather than 'repair' poverty through benefit expenditure (Morel et al., 2012). The social investment strategy is clearly visible in the EU 2020 Growth Strategy, which is the new steering wheel for European social and economic integration for the period 2010-2020. In this Growth Strategy, EU countries are supposed to raise employment rates from 69 to 75 percent and to reduce poverty by 25 percent (Cantillon & Vandenbroucke, 2014). In other OECD countries, such as the United States, the idea that creating jobs is key for poverty reduction is equally widespread (Baker & Bernstein, 2014).

Yet, drawing on a wide array of data sources, it has been firmly established that from the mid-1980s OECD countries did not make much headway in reducing poverty. Despite a continuous dynamic of economic growth, increasing employment rates, and high levels of social spending in the period before the Great Recession, poverty rates for working-age people and children either rose or stayed stable, with only few countries reporting a significant fall (Burniaux et al., 1998; Fritzell & Ritakallio, 2010; OECD, 2008). Even the feted Scandinavian model has generally been unable to counter this trend. Poverty increased significantly in Sweden and Finland and remained unchanged in Denmark (Morelli et al., 2015).

In this paper we focus on the impact of the marked rise in women's employment across OECD countries during the past decades on trends in relative income poverty. The reasons for our focus on womens employment are twofold. First, most of the growth in employment in these countries has been among women, with mens labour force participation rates being relatively stable. This increase in womens employment was the result of a combination of demographic and institutional developments (Nieuwenhuis et al., 2012), such as womens rising levels of education (Bradley, 2000), lower fertility (Van der Lippe & Van Dijk, 2002), and the increasing availability of public policies such as paid leave and childcare services (Hegewisch & Gornick, 2011; Thévenon & Luci, 2012). Second, it has often been overlooked that although womens employment rates have shown marked rises, these trends have levelled of in various OECD countries. For instance, in the United States it was documented that female labour force participation plateaued in the mid-1990s (Cotter et al., 2004; England, 2010), and showed a negative trend during the first half of the 2000s (Boushey, 2008). In the Nordic

Figure 1: Percentage point changes in women's employment rates and and poverty rates between mid-1980s and 2010, 14 OECD countries. Source: LIS



countries, very stable and high female labour force participation rates were observed since at least the 1980s. Such levelling employment rates can have important implications, for they present a limit to the extent further increases in employment could potentially help reduce poverty.

Analysing the impact of trends in womens employment on trends in poverty, however, is not as straightforward as it might seem. Indeed, households are consistently found to be less likely to be poor when at least one household member is employed, and this poverty risk is further reduced for dual earner households (Andreß & Lohmann, 2008; Crettaz, 2013; Maldonado & Nieuwenhuis, 2015). Encouraging employment could therefore seem to be a sensible policy strategy to reduce poverty rates. However, what is true at the micro level, is not necessarily true at the macro level. This is illustrated in Fig. 1, showing macro-level changes in womens employment rates and changes in poverty rates for 15 OECD countries between the mid-80s and 2010. In the majority of countries, a rise in womens employment rates has been associated with an increase in working-age poverty rates.

This paradox between womens employment growth and trends in poverty,

with on the micro-level individual womens employment being negatively associated with poverty in their household, but on the macro-level growth in womens employment rates seemingly being associated with rising poverty, suggests that macro-level analyses are ill suited to assess the impact of womens employment growth on poverty. The reason for this is that such macro-level analyses cannot observe whether the employment growth was among households that as a result of their increased employment were lifted out of poverty, among households that were not poor to begin with, or among households remained poor despite having increased their employment. Therefore, based on the presence of such a macro-micro paradox, this association between macro-level trends should be studied using micro-level data (Nieuwenhuis, 2015). Although many studies have observed that the macro-level relationship between employment and poverty is not self-evident, none of these have been able to link the micro-level association between employment and poverty to macro-level outcomes; hence, no study has been able to model the *actual* impact of rising women's employment on poverty trends. Moreover, these studies invariably focus on total employment and did not account for the fact that employment growth has generally been a womens affair. Hence, in this study we answer the following question: *To what extent have trends in womens employment affected working-age poverty rates in OECD countries between 1975 and 2013?*

By answering this question using an innovative application of the Blinder-Oaxaca decomposition, we provide to the literature a micro-to-macro analysis of the association between womens rising employment rates and trends in poverty. It should be emphasised that we are not interested in explaining trends in womens employment as such. We are interested in assessing the total impact of rising womens employment on poverty. As will become clear, we will account for the fact that not all employment protects equally well against poverty, but it is beyond the goal and scope of this study to empirically differentiate between types of employment.

To our knowledge, Stier and Lewin (Stier & Lewin, 2002) have been the only ones to study focusing on womens employment and its relationship with poverty outcomes for a single country, Israel. They simulated various scenarios in which non-employed women enter the labour market at different levels of work intensity and numbers of working hours per week. The results suggested that increasing womens employment - even at part-time level - would effectively reduce poverty in society. In discussing these result, Stier and Lewin emphasised the importance of taking account of single parent families in assessing the impact of employment growth on poverty: while getting female single earner families into the labour market had a poverty-reducing effect, women in couple households entering the labour market had

a poverty-enhancing effect through increasing median incomes, albeit not strong enough to offset the poverty reduction gained by working single parent families.

Others have applied regression-based simulation techniques to examine the potential impact of attaining the EU2020 employment target (75% of active age people should be in paid employment by 2020) on poverty outcomes in EU countries (Marx et al., 2012). They obtain mixed results: in most countries large employment shifts yield rather small decreases in poverty rates, in few countries poverty even increases. They argue that the projected employment growth would benefit the incomes of some households but would cause the poverty line to shift as well, making others less well off than they were before as a result. In their forward-looking simulation exercise, they werent able to disentangle the actual impact of employment growth on poverty outcomes. To do so, is the purpose of the present study.

Theory

The paradox between womens employment growth and trends in poverty, as introduced above, is a typical example of an aggregation paradox (Yule, 1903; Simpson, 1951). Aggregation paradoxes imply that correlations between two variables can be different or even completely in the reverse direction at different levels of aggregation (Nieuwenhuis, 2015). For the current study, this means that based on the existence of a negative association between womens employment and poverty at the micro-level, it cannot be inferred that at the macro-level growth in womens employment will be associated with lower rates of poverty. There are three possible explanations for this phenomenon that bear relevance to this study.

First, it could be that growth of womens employment was among women who live in households that were not poor. In that case, womens employment would indeed rise without having a direct impact on poverty rates. It has been meticulously documented how the observed increase in female labour market participation over the past decades in OECD countries has been a socially stratified process, with low-skilled women participating to a much smaller extent than their higher-educated counterparts (Cantillon et al., 2001; Evertsson et al., 2009; Konietzka & Kreyenfeld, 2010). Moreover, marital homogamy boosts a positive correlation between spouses earnings (Blossfeld & Drobnič, 2001), further exacerbating the labour market disadvantage and the welfare gap between low-skilled and high-skilled families. As a matter of fact, people living in workless or near workless households are most at risk of poverty (OECD, 2011). It has been hypothesized that such stratified in-

crease in womens employment would go hand in hand with rising inequality between households. Esping-Andersen (p. 59), for one, wrote that "*if labour supply is positively correlated with education, female employment will almost certainly enhance inequalities*" (Esping-Andersen, 2009). As such, an aggregation paradox would occur if the distribution of jobs exacerbates the gap between highly-educated dual earner households and low-skilled, low-work intensity households, pushing up median income as a corollary (Marx et al., 2012).

Gregg and Wadsworth (Gregg & Wadsworth, 2001, 2008) have shown that employment in a host of OECD countries has indeed become polarised into work-poor and work-rich households: while the share of households where everyone is in paid work has grown, the share of jobless households did not decrease. Corluy and Vandenbroucke (Corluy & Vandenbroucke, 2014) found that in European countries the most of the divergence between individual and household joblessness came from an skewed distribution of jobs. However, when linking polarisation to poverty outcomes during the brief period of 2004-2007, they stated that poverty trends in several European countries were only to a limited amount attributable to a failure to reduce joblessness. On the other hand, in his analysis of 15 EU countries and the United States, De Beer (de Beer, 2007) found that the simultaneous increase in employment and poverty rates in the majority of the countries in his sample could be explained by the fact that most of the additionally employed people belonged to work-rich households, i.e. "*many housewives with employed spouses had found jobs*" (p. 383). The consequence of this first explanation of the aggregation paradox is that to assess the impact of rising womens employment on poverty rates, we also need to account for whether these women live with a partner in the household and whether this partner is employed or not.

The second explanation of the aggregation paradox is that the growth of womens employment was among women who lived in poor households, but that the earnings from their employment are insufficient to elevate their household above the poverty threshold. Work is not always a guarantee for a poverty-free existence (Andreß & Lohmann, 2008). It has been well established that in-work poverty is a multifaceted phenomenon that is shaped by employment characteristics (working hours, hourly wages), composition of the household, and the institutional context (Crettaz, 2013; Lohmann & Marx, 2008). In particular womens employment has been cause for concern, as women are overrepresented in non-standard work arrangements such as temporary employment and part-time employment. These jobs are associated with an hourly wage penalty and fewer working hours per week (OECD, 2008). Such gender gap in wages and working hours could lead to in-work poverty, in particular in conjunction with care for dependent children, still

overwhelmingly a womens affair in OECD countries (Uunk et al., 2005). The composition of the household is of uttermost importance to fully understand this phenomenon, though. Since women working in non-standard working arrangements are often secondary earners, even a small or lowly paid job might be sufficient to stay out of poverty (Horemans, 2014). In the case of sole breadwinner of single parent households, however, even a well-remunerated job might not suffice for them to make ends meet (Immervoll, 2007; Marx & Nolan, 2012; Maldonado & Nieuwenhuis, 2015). The consequence of this second explanation of the aggregation paradox is that we will have to separate the impact of a woman being employed from the degree to which being employment protects against poverty and from the degree to which this protective impact of employment has changed over time.

The third explanation of the aggregation paradox is that poverty outcomes are influenced by many factors, and that it could be the case that confounding variables are causing an aggregation paradox to appear. It has been observed, for instance, that minimum income protection schemes have become increasingly inadequate in providing income levels to sustain families with low work intensity above the poverty threshold (Nelson, 2011). The overall tendency for the 1990s was one of almost uniform erosion of benefit levels relative to average wages in OECD countries (Van Mechelen & Marchal, 2013). Although this downward trend came to a halt in a number of countries, net incomes of minimum income benefit recipients continue to fall short of the poverty line (Marx & Nelson, 2013). As such, the impact of employment gains on poverty outcomes may be cancelled out by rising poverty rates amongst working-age jobless households, a phenomenon that has been observed in many developed welfare states. This implies that without these employment gains, poverty rates would have been higher still. The consequence of this third explanation of the aggregation paradox is that we will have to employ a statistical technique that accounts for unmeasured heterogeneity.

Because of these explanations of the aggregation paradox between womens employment and poverty, and particularly the first two explanations, it is difficult to a-priori formulate expectations on whether and in which direction rising employment rates of women will affect poverty rates. There are, however, two bodies of literature that are informative in this respect. A large body of empirical work has been devoted to the question whether womens rising employment exacerbates or attenuates inequality among households. Running counter to what can be expected based on the skewed distribution of jobs over households, the literature consistently finds that rising womens employment and earnings had an attenuating instead of exacerbating effect on inequality among coupled households (Gregory, 2009; Lam, 1997). This

has been established in studies examining how inequality among households was affected by womens earnings in single countries (Mincer, 1974; Björklund, 1992), across countries at one point in time (Harkness, 2013), and over time across OECD countries (Nieuwenhuis et al., 2013). While this literature is limited to coupled households, and addresses inequality rather than relative poverty, it does provide a prior indication that increasing employment rates of women narrows the income distribution. This potentially reduced the number of households living in poverty:

Employment Rate Hypothesis Poverty in OECD countries would have been higher and been rising faster since the 1970s, if womens employment rates had not been rising in that same period.

Not only did womens employment rates rise in OECD countries, so did the earnings among those women who were employed (Costa, 2000). This was due to women (on average) starting to work more hours, working in better-paid positions, and the narrowing of the gender-wage gap (Blau & Kahn, 2000; Charles, 2011). This means that the income from womens employment potentially became increasingly important in protecting a household against poverty, particularly as the earnings of more women became sufficient to ensure that her household was not poor even if no other individuals in the household were involved in paid employment. This does not necessarily mean that increases in womens earnings resulted in a reduction of poverty, for instance if earnings increased among women in families who were not poor to begin with, or if these earnings improvements were not sufficient to protect some households against in-work poverty (Marx & Nolan, 2012). Overall, though, we expect that the net impact of the changing earnings among employed women was that their employment became more strongly negatively associated with poverty, or in other words that their employment became more protective against poverty:

Employment Protection Hypothesis Poverty in OECD countries would have been higher and been rising faster since the 1970s, if the negative association between womens employment and poverty had not become stronger.

Data

It follows from the above that to test our hypotheses we require micro-level data on household-level poverty and on employment of household members, that is comparable across countries, and that observes countries over the

span of several decades to analyse trends. We have used data from the Luxembourg Income Study Database (LIS, 2016), that harmonises existing survey data to a common template to ensure cross-national and over-time comparability (Nieuwenhuis et al., 2016).

We were able to select 15 OECD countries that were covered in the LIS Database for several decades. In each of these countries, we first calculated households poverty risk, defined as having a disposable household income below 60% of the national median equivalised household income, which is in line with the EU open method of coordination for policy evaluation (Atkinson et al., 2002). Household income was corrected for household size, using the modified OECD equivalence scale (OECD, 2011) in which the first adult was weighted 1, the second and additional adults were weighted .5, and children younger than 14 were weighted .3. We are interested in the poverty risk of households (rather than individuals), selecing a sub-sample of households in working age population, defined as at least one household member aged between 25 and 59. We included couples, single men, and single women, but for technical reasons we had to drop same-sex couples. We list-wise removed observations that had missing values on one or more of the variables described below. In total, this resulted in a sample of 2,129,193 observations, from 129 LIS datasets covering 15 countries over a timespan from 1971 to 2013. For each country, Table 1 shows the number of observations, the number of years it observed, and the timespan covered.

The analyses were based on a limited number of 5 variables. The rationale for using only such a small number of variables is explained below. The variables were:

Poor Binary indicator of a household being at risk of poverty (AROP), defined as having an household income (equivalised for size using the modified OECD scale) below 60% of the national median equivalised household income. This median household income was based on all households in the data (not just based on our subsample).

Womans Employment A binary indicator of whether the woman living in the household, if present, is currently employed or not. This is the independent variable of interest.

Mans Employment A binary indicator of whether the man living in the household, if present, is currently employed or not. This variable serves to control the effect of womens employment for the impact of mens employment (and therefore dual earnership).

Single woman A binary indicator of a household headed by a single woman.

Table 1: **Descriptive statistics on countries, observed years, and number of observed households.**

Country	N. Year	First Year	Latest Year	N. Households
Australia	8	1981	2010	60,487
Canada	12	1981	2010	233,230
Denmark	7	1987	2010	293,253
Finland	7	1987	2010	55,494
France	7	1978	2010	55,998
Germany	11	1973	2010	147407
Israel	8	1979	2010	30,792
Italy	11	1986	2010	58,536
Netherlands	8	1983	2010	38,297
Norway	8	1979	2010	332,605
Poland	7	1986	2010	138,512
Spain	8	1980	2010	66,432
Sweden	6	1981	2005	52,959
United Kingdom	10	1974	2010	105,319
United States	11	1974	2013	469,872
Total	129	1971	2013	2,129,193

Source: LIS Database.

This control variable serves to account for an increasing number of women living as single.

Single man A binary indicator controlling for households headed by a single man.

Method

The data were analysed using a Blinder-Oaxaca decomposition (Oaxaca, 1973; Jann, 2008; Sinning et al., 2008), which allows us to link micro-level associations in womens employment to macro-level trends in poverty. This decomposition compares the proportion of poor households in two different years to assess whether poverty rates have changed over time. Then, it decomposes the change in poverty into (a.) changes in the proportion of women who are employment (controlled for changes in average scores of other independent variables) and (b.) changes in the association between

womens employment and the dependent variable poverty (again, controlled for the other independent variables). In other words, with respect to womens employment and poverty, the Blinder-Oaxaca technique can be used to decompose a change in poverty into (a.) changes in womens employment rates and (b.) changes in the degree to which individual womens employment protects a household against poverty.

The first step in the Blinder-Oaxaca decomposition is estimating a regression model (with the same model specification) for each year separately. In our case, this model is straightforward, and purposively kept simple:

$$\begin{aligned} logit(P_{poor}) = \alpha &+ \beta_1 \times WomanEmployed \\ &+ \beta_2 \times ManEmployed \\ &+ \beta_3 \times SingleWoman \\ &+ \beta_4 \times SingleMan \end{aligned} \tag{1}$$

For the purpose of this paper, we will focus on the impact of a woman being employed (β_1) only, while controlling for the other variables. The second step of the Blinder-Oaxaca technique is to decompose the change in poverty, for instance between 1975 and 1980:

$$\Delta_{poverty} = \overline{Poor}_{1975} - \overline{Poor}_{1980} \tag{2}$$

The trend in poverty ($\Delta_{poverty}$) is decomposed into two components, referred to as the endowment effect and the coefficient effect. It should be noted that the decomposition presented below applies to linear regression models, whereas we apply it to logistic regression. The conceptual argument is the same, and the presented version is more concise. Since the log-odds of households being poor can be expressed as a linear function of the parameters of Equation 1, we could decompose changes in the mean of these log-odds using Equation 2. However, we are not interested in this but in decomposing the change in the probability that a household is poor. As this probability is not a linear combination of the parameters of Equation 1, we use Yun's generalisation of the Oaxaca decomposition (Yun, 2004).

The endowment effect of women's employment is:

$$Endowment = (\overline{WomanEmployed_{1975}} - \overline{WomanEmployed_{1980}}) \times \beta_{1(1980)} \tag{3}$$

The coefficient effect of women's employment is:

$$Coefficient = \overline{WomanEmployed_{1975}} \times (\beta_{1(1975)} - \beta_{1(1980)}) \tag{4}$$

The endowment effect represents how much of the change in poverty over time can be attributed to changes in the proportion of women who were employed, and is a function of the change in the average score on the womens employment variable (i.e. an increased number of employed women), multiplied by the coefficient of womens employment on household poverty risk. For the latter, we selected the most recent year. In the example above, the endowment effect can be expressed and interpreted as the number of percentage points poverty would have been higher (/lower) in 1980, if the average number of employed women had not changed since 1975. The coefficient effect represents how much of the change in poverty over time can be attributed to trends in how strongly womens employment was (negatively) associated with poverty, and is a function of the change in the coefficient of a womans employment on household poverty risk between (in the example above) 1975 and 1980, multiplied by the (average) number of employed women in 1975. The interpretation of this coefficient effect is the number of percentage points poverty would have been higher (/lower) if the degree to which a womans employment protects a household against poverty would not have changed from 1975 to 1980 for the number of women who were employed in 1975.

For each country, we will perform two sets of decompositions. The first compares each year to the previous year in which the same country was observed in the LIS database. This provides estimates of short term changes in womens employment and poverty, typically covering 3 to 5 years between 2 LIS waves. The second set of decompositions will compare each observed year to the first year the country was observed in the LIS database. This provides estimates for the longer term trends. As we will present estimates for both sets of decompositions, and both for the endowment and the coefficient effects, we will limit ourselves to a graphical presentation of the results, and focus only on the impact of changes in womens employment.

Five final comments should be made before presenting the results. First, the goal of this paper is to assess the total impact of trends in womens employment rates on trends in poverty. This is the reason that we opted for a simple statistical model. However, it should be noted that with the Oaxaca decomposition we still distinguish between changes in the number of employed women, and the degree to which womens employment protects against poverty. Trends in the latter can be caused by various factors, including women working longer hours, in better-earning positions, and for higher wages. While we do not go into such detailed explanations, the decomposition picks up on the impact of changes in how well womens earnings from employment protect their households against poverty on macro-level trends in poverty. Secondly, unobserved variables that are determinants of womens employment are represented in both the endowment effects and the coefficient

effects. This is desirable, and reflects our goal as described above to estimate the total effect of changes in womens employment on trends in poverty. To the extent that the unobserved variables do not determine womens employment, but do affect (trends in) poverty, this is accounted for by the Blinder-Oaxaca decomposition (in technical terms by the difference between the intercepts of Equation 1 as estimated for the two separate years). In addition, since we analyse trends within countries, all time-invariant (unobserved) heterogeneity is accounted for as well, similar to commonly applied fixed-effects designs (Angrist & Pischke, 2009). Thirdly, when interpreting the endowment effects and the coefficient effects, one should realise that these can be, to some extent, correlated. For instance, it was argued that decreasing levels of social protection and/or low wages have been the price for increasing employment rates (including those of women) (Iversen & Wren, 1998). In our framework, this would result in the suppression of the coefficient-effect (due to the lower wages). So, to interpret the total impact of the rise of women's employment, one could interpret the sum of the coefficient effects and the coefficient effects. We return to this issue in the discussion. Fourthly, in the graphical results that follow, a small number of outliers were removed from the data. These were likely caused by multicollinearity in the data, and none of these outliers were statistically significant (with very large standard errors). Finally, in the description of our results we emphasise the endowment effects. This was instigated by the primary motivation of study, which pertains to social policy goals of increasing the *number* of employed women in relation to the goal of reducing poverty.

Results

In this section we present the results of the Blinder-Oaxaca decomposition. As these analyses produce a substantial amount of output, we present the key results in Figures only (in the Supplementary material at Table 2 is presented with the (numerical) estimates). Fig. 2 presents, for 15 OECD countries, trends in three key indicators. First, Panel A shows trends in households at risk of poverty. It is evident from these results that poverty rates differ substantially between countries, being relatively high in for instance the United States and Israel, and typically lower in the Nordic counties such as Sweden, Denmark and Finland. Trends in poverty were either absent or upwards, particularly in Israel and Italy over the whole period and in Spain, Sweden, and Finland in recent years.

Panel B, labelled FLFP (Female Labour Force Participation), shows observed trends in womens employment. These trends are upwards in almost

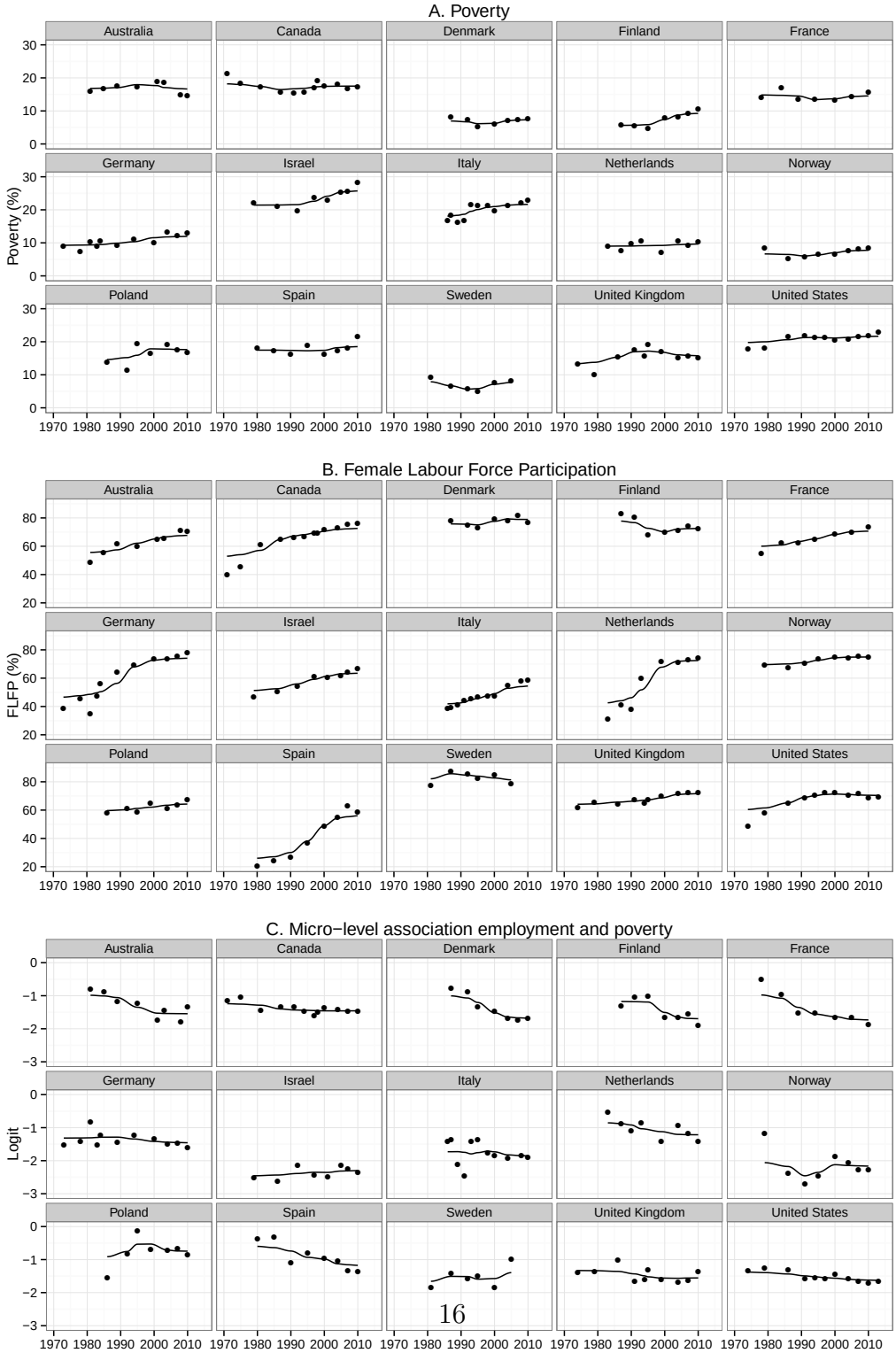
all countries. The Netherlands, Germany and Spain show marked increases, whereas trends are more moderate in for instance Poland, France and the United Kingdom. The Nordic countries are characterised by comparatively high rates of womens employment, but show barely any further increase in the period observed. Sweden and Finland even show a small decline. Upward trends followed by a plateau were found in for instance the United States, the Netherlands and Germany.

Panel C shows the estimated 'logits' of the effect of womens employment on the poverty risk of households. In all countries these logits are negative, indicating that households were less likely to be poor when a woman was employed (controlled for being single or not, and the effect of her partner working or not). Typically, the logits became more strongly negative over time, suggesting that womens employment became more important in protecting a household against against poverty. As theorised above, this could be the result of women working more hours, in higher status positions and for higher wages.

The three panels of Fig. 2 combined show the same macro-micro paradox discussed in the introduction (See Fig. 1): Despite marked increases in womens employment rates, and despite womens employment becoming increasingly protective against poverty, OECD countries displayed absent or upward trends in poverty. This again demonstrates the need to examine the macro-level association between trends womens employment and trends in poverty using micro-level data.

Fig. 3 shows the 'Endowment' effects from the Blinder-Oaxaca decomposition. These endowment effects indicate the extent to which trends in poverty were affected by increases in womens employment rates net of the impact of changes in the degree to which employment and other determinants protect against poverty. The black lines present the short term, "year to year" endowment effects, representing the degree to which poverty would have been higher (/lower), if womens employment had not increased (/decreased) since the previously observed year. The light coloured trends present the long term, "cumulative" impact of changes in womens employment, representing how much poverty would have been different if womens employment had not changed since the first year in which a country was observed. Canada provides a clear case to illustrate the interpretation of these results. Between 1971 and 1975, female labour force participation rose from 40% to 46%. The endowment was slightly positive, at +0.6. This means that if womens employment had not risen, poverty would have been 0.6 percentage points higher in Canada in 1975. Then, from 1975 to 1981, female labour force participation further rose to 61%. This had a short-term endowment effect of +2.8 percentage points. The long-term endowment effect indicates that

Figure 2: Trends in (A.) Poverty, (B.) Female Labour Force Participation (FLFP), and (C.) Micro-Level Association Women's Employment and Poverty (Logit)



if womens employment had not risen since 1971, poverty in 1981 in Canada would have been 3.9 percentage points higher: 21% instead of the observed 17%. After 1981 the increase in female labour force participation was much slower, which translated to small (and frequently statistically insignificant at the 5% level) endowment year-to-year effects. Nevertheless, these small endowment effects added up to a statistically significant long-term endowment effect of 6.8 percentage points in 2010. Following this example, we discuss three key findings regarding the endowment effects.

First, we found that in these 15 OECD countries, rising female labour force participation rates typically contributed to reduced poverty. However, the short-term, year-to-year effects were found to be typically small and not always statistically significant. This suggests that while a woman who entered employment might have had an immediate impact on the economic well-being of her household, the process of rising female labour force participation rates having an impact on a countrys poverty rate is typically a long-term process. Indeed, the results indicate that over time, the small effects accumulate to sometimes sizeable endowment effects of up to 5.7 percentage points in the Netherlands in 2010, 7.5 percentage points in Spain in 2007, and 7.8 percentage points in Israel in 2010.

Secondly, it was found that there was almost no endowment effect in Nordic countries where womens employment rates were very high throughout the observation period. In Denmark, with womens employment rates being stable at around 80%, the long-term endowment effect from 1987 to 2010 was +0.3 percentage points. In Finland and Sweden a slight decline in womens employment was observed, translating in a slight increase in poverty (long-term endowment effects of -1.6 and -1.4 respectively).

Finally, in countries that initially showed marked increase in female labour force participation, this increase was typically followed by a levelling off in that trend, or even a plateau. This was clearly observed in the United States and Canada, but also in Spain and the Netherlands. Consequently, the short-term endowment effects became close to 0 as well. For instance, the short-term endowment effects were no longer statistically significantly different from 0 in the Netherlands after 1999. In the United States it was observed how the short-term endowment effects became increasingly close to 0, with the long-term endowment effect levelling after 1997 at a level around 5 percentage points.

In the methods section it was already explained that the coefficient effects, displayed in Fig. 4, are more difficult to interpret. Nevertheless, it is worth pointing out that these coefficient effects are typically much smaller than the endowment effects. For instance, in the United States the logit of womens employment decreased from -1.3 in 1974 to -1.6 in 2010. The long-term

Figure 3: Endowment Effects: Impact of Trends in Women's Employment on Trends on Poverty

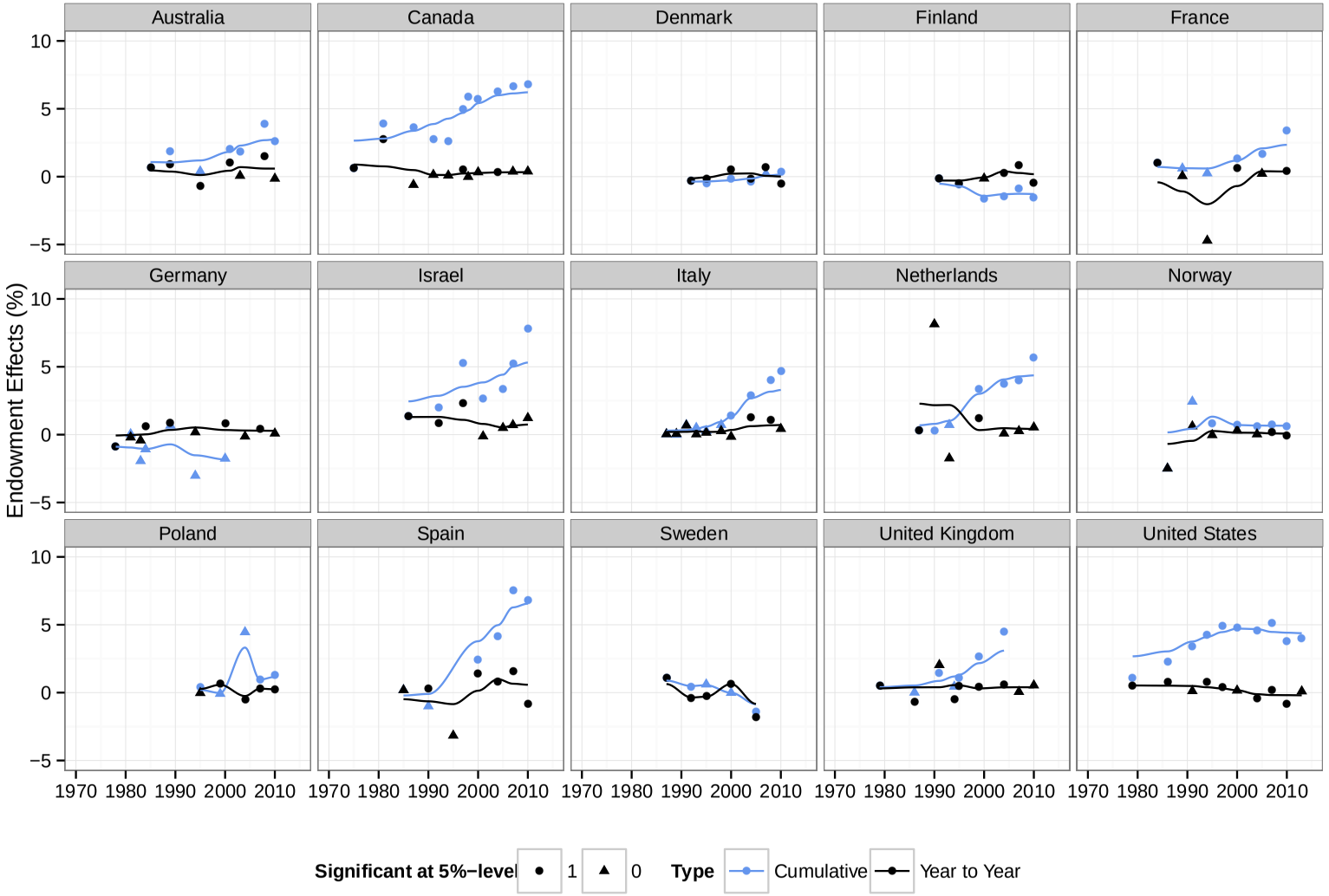
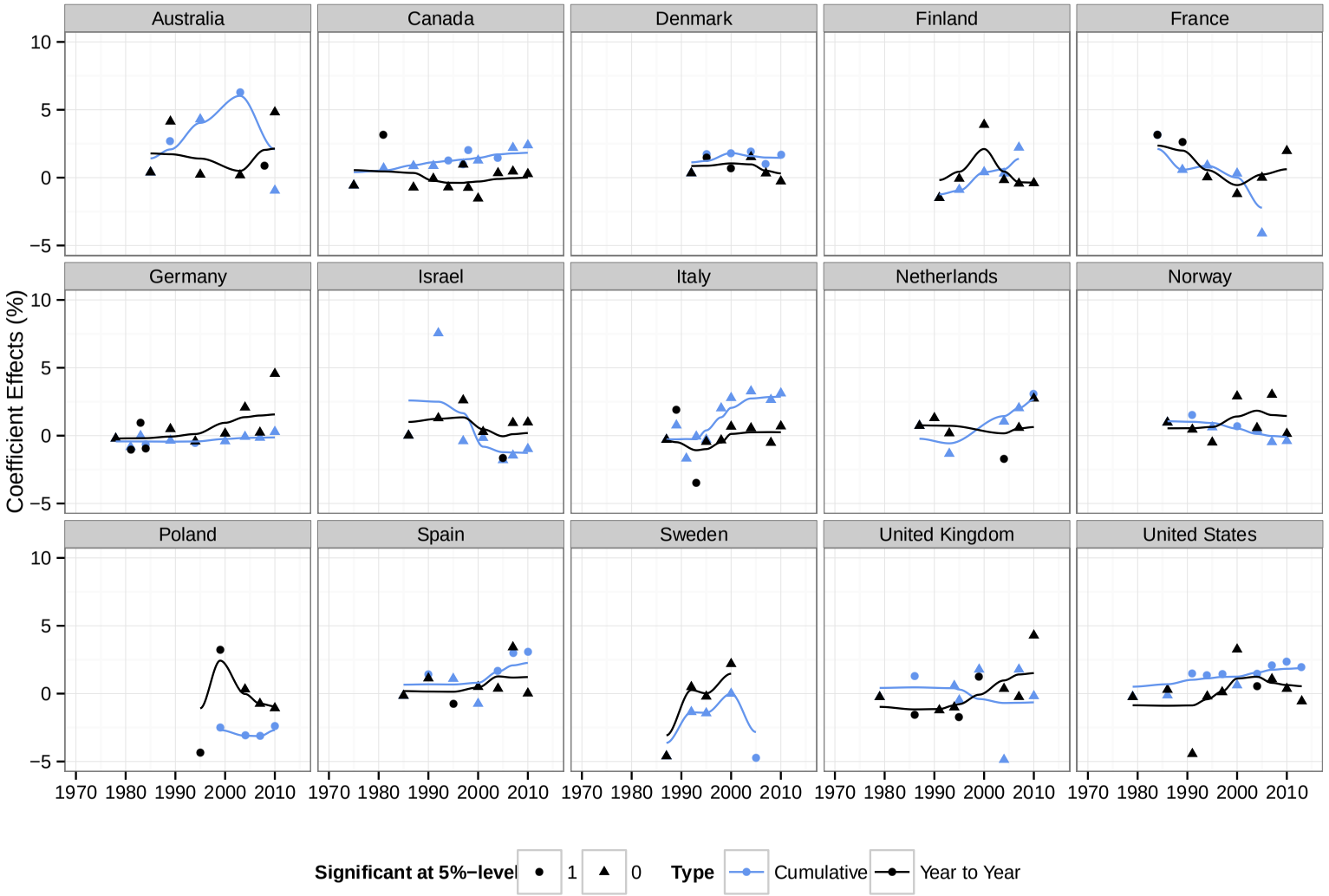


Figure 4: Coefficient Effects: Impact of Trends in Poverty-Protection (logit) Women's Employment on Trends on Poverty



coefficient effect indicates that had this change in the protective effect of womens employment not occurred, poverty in 2010 would have been higher by 2 percentage points. However, in many other countries, while the logits of womens employment on poverty risks consistently became more negative, the coefficient effects often failed to reach statistical significance.

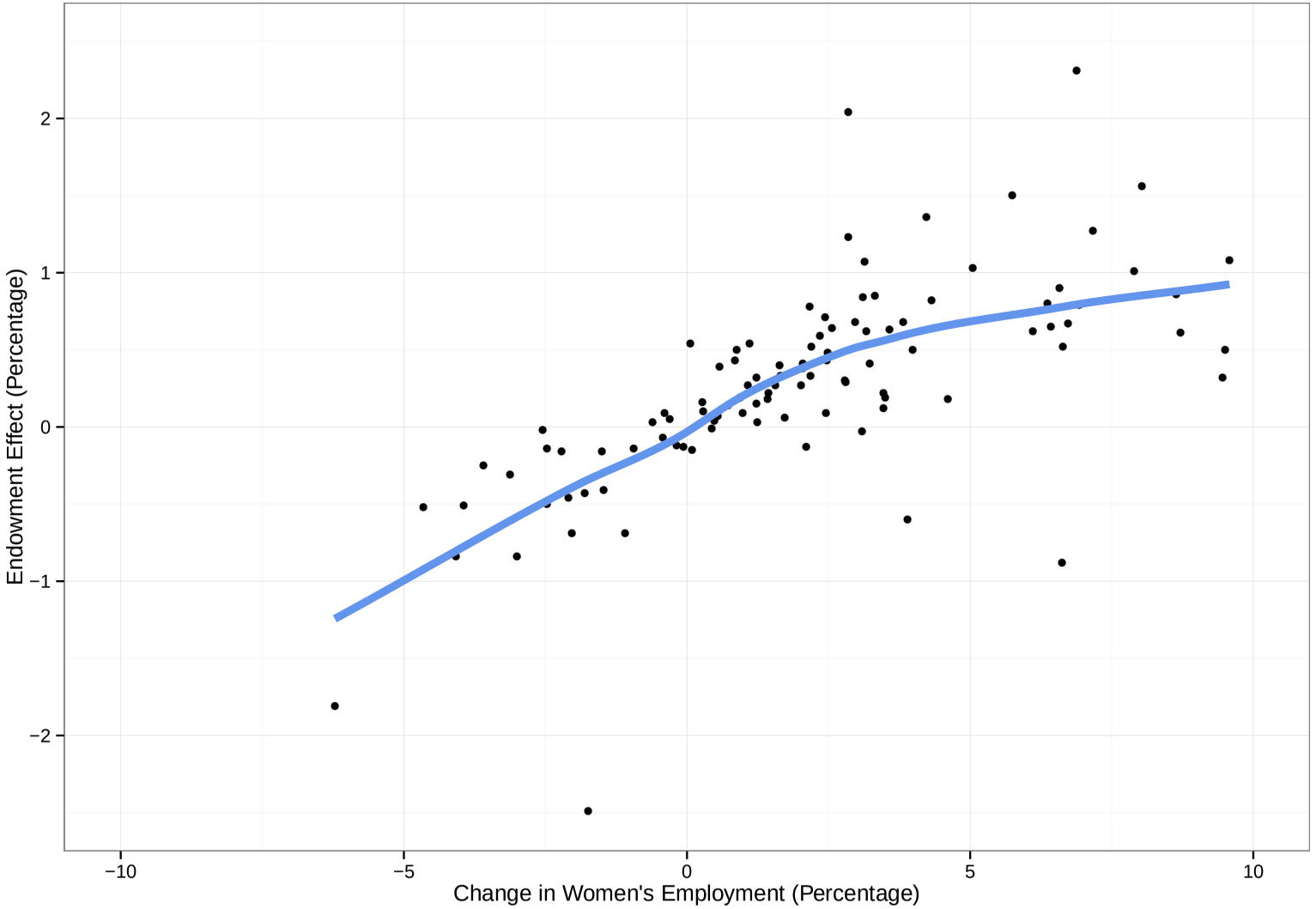
With respect to our two hypotheses, we therefore conclude that our findings corroborate the "employment rate hypothesis", while the "employment protection hypothesis" generally was not supported by our findings. As a final step in our analyses, we further examine the endowment effect. In Fig. 5, the association between changes in female labour force participation rates and the (short-term) endowment effect of these changes on poverty are plotted. The data-points of the different countries in our analyses were combined here. As would be expected, the line crosses the origin of the graph, representing that no change in womens employment aligns with no endowment effect on poverty. Increases in womens employment were associated with endowment effects reducing poverty, although at each level of increase in womens employment a substantial amount of variability in endowment effects was observed. Declining female labour force participation was associated with negative endowment effects, indicating an increase in poverty. Overall, these results suggest that poverty reduction of 1 percentage point requires womens employment rates to rise with about 10 percentage points. In the next section we will reflect on these findings and their policy implications.

Conclusion and Discussion

The surge in womens labour market participation is undoubtedly the most important social change that welfare states have experienced in the past four decennia. Its consequences reach very far. First, it was a key driver of the increase of the work volume that labour markets and welfare states have experienced over the past decades. This expansion of the work force may also have had a distributional impact, including the exclusion of low-skilled people. Second, care labour that women had previously done unpaid got a high and direct price. Welfare states had to take up a significant part of care work. Third, 'new social risks' arose (Bonoli, 2013) to which the traditional welfare state did not have an answer: the work-life balance and in a society in which dual earnership became the norm the inadequacy of a single household income.

Not surprisingly then, changing womens role had important implications for both the levels and distribution of household incomes. The post-industrial phase of economic growth was "*unambiguously associated with increasing fe-*

Figure 5: General Association Between Change in Women's Employment and (Year-to-Year) Endowment Effect on Trends in Poverty



male labor" (Olivetti, 2013, p. 6). After the first phase of welfare capitalism in which economic growth coincided with a reduction of female labour force participation (the industrial economy mainly needed male labour force supported by the good homely care of the housewife), the growth of the new service and knowledge economy was supported by the growing group of educated women to an important degree. Hence, rising labour force participation of women was an important factor in the increase of (median) household incomes, and consequently of growth of the Gross Domestic Product (GDP). Literature also consistently finds that rising womens employment has had an attenuating effect on inequality among couples. Despite homogamy (that causes the accumulation of high or low incomes at the household level), womens earnings attenuate to a certain degree the unequal distribution of individual incomes. So, instead of women's earnings "*almost certainly increas[ing] inequalities*" (Esping-Andersen, 2009, p. 59) women's earnings hence had a positive impact on what is now called '*pre-distribution*' (Hacker, 2011). This was again confirmed by the current findings.

In this paper we showed that womens rising employment also reduced poverty defined as living with an income below 60% of equivalized median income. Typically, since the mid 80s in the 15 OECD countries under review in this paper a 10 percentage point increase of womens employment was associated with a poverty reduction of 1 percentage point. The poverty standstill observed in many countries during the past decades can thus at least partially be explained by rising women labor market participation. Had womens employment not become more common, poverty would have risen more; in some countries even substantially more.

This is of course not to say that there were only winners. Along with increasing womens employment a striking polarisation of jobs over households took place. The share of the group of households that employs its full work potential (the so-called work-rich households) has increased significantly, while the share of work-poor families remained very stable. Both groups have a very different social profile: work rich families are highly educated and often cumulate two incomes. Work poor families often are low-skilled, single-parent families and couples that did not succeed to access the post-industrial labour market. Previous research indicated that poverty among these work-poor households has risen consistently and has now reached extremely high levels (Cantillon & Vandenbroucke, 2014). As a general rule, even though there are great differences across countries, the social protection for these households has become less adequate and less secure. However, in the general poverty statistics, the increasing precariousness of work-poor families has been neutralised by the increase in the share of two-income families. The positive influence of womens rising labour market participation on

relative income poverty is thus the consequence of compensating movements, with winners and losers. Related to this issue, we mentioned the possibility that the rise of women's employment came at the cost of lower wages (Iversen & Wren, 1998). To the extent to which this mechanism occurs, we may have overestimated the impact of the trend in women's employment. Moreover, it could well be that this mechanism has reduced the strength and impact of how well women's employment protects their households against poverty.

In most countries, the process of womens increasing labour market participation seems to have reached an upper limit; upward trends were found to plateau in the US, the Netherlands and Germany. The Nordic countries showed very high levels of female employment, but with no further increase. Sweden and Finland even showed a small decline, as did the US in recent years. This poses a serious challenge for social policies that seek to stimulate women's employment to reduce poverty (Cantillon, 2011). Even though rising women's employment rates have had a substantial impact on reducing poverty in various countries, it took place over the course of several decades. Moreover, these reductions in poverty required an increase in women's employment that was so substantial that such an increase cannot be repeated given the limit that women's employment rates seem to have reached in most countries. Regardless of what caused women's employment rates to rise, be it due to social policies, demographic shifts, or both (Nieuwenhuis et al., 2012), our findings suggest that the potential for further compensating poverty by increasing women's employment rates has, to a large extent, been depleted.

Of course, the focus of our study was on the *total* effect of rising women's employment on poverty, which means that (other than for changing family structure) we did not control for variables explaining women's employment, nor did we differentiate between the employment and poverty of women with different social backgrounds. This means that our findings point toward the limited potential for social policies to further reduce overall poverty rates by stimulating women's employment, but that this does not preclude facilitating employment to reduce poverty among specific socio-demographic groups. In addition, social policy can operate in other ways than merely stimulating the *number* of employment women. Indeed, viable options seem to include, a priori, initiatives to increase the level and equal distribution of wages among those who are employed, to reduce in-work poverty (Lohmann & Marx, 2008), to reduce the gender pay gap (Mandel, 2012; Evertsson et al., 2009), or to encourage a more equal use of public childcare (Van Lancker, 2013).

The important open question then is how the distribution of family income and poverty will evolve in the future when the compensating mechanism of increasing womens employment will fade out. In that regard, the relation between the observed increases in poverty in Sweden and Finland and the

standstill of the emancipation process should be subject of further research. Given our results, however, we can expect that many countries where poverty trends have been stable in the past, might have to shoulder for rising poverty in the future.

Supporting Information

Table 2: Blinder-Oaxaca Decomposition: Endowment Effects and Coefficient Effects

		Year-to-Year				Cumulative			
Country	Year	Endow.	Sig.	Coef.	Sig.	Endow.	Sig.	Coef.	Sig.
Australia	1981								
	1985	0.67	1	0.39	0	0.67	1	0.39	0
	1989	0.90	1	4.14	0	1.87	1	2.67	1
	1995	-0.69	1	0.23	0	0.39	0	4.30	0
	2001	1.03	1	17.99	0	2.03	1	12.39	1
	2003	0.07	0	0.18	0	1.83	1	6.28	1
	2008	1.50	1	0.87	1	3.89	1	-9.28	0
	2010	-0.14	0	4.82	0	2.60	1	-0.95	0
Canada	1971								
	1975	0.62	1	-0.57	0	0.62	1	-0.57	0
	1981	2.75	1	3.15	1	3.91	1	0.69	0
	1987	-0.60	0	-0.72	0	3.62	1	0.86	0
	1991	0.14	0	-0.07	0	2.76	1	0.87	0
	1994	0.09	0	-0.71	0	2.61	1	1.26	1
	1997	0.52	1	0.97	0	4.97	1	0.97	1
	1998	-0.01	0	-0.74	0	5.88	1	2.02	1
	2000	0.33	0	-1.53	0	5.72	1	1.27	0
	2004	0.33	1	0.34	0	6.27	1	1.45	1
	2007	0.38	0	0.46	0	6.66	1	2.20	0
	2010	0.39	0	0.27	0	6.79	1	2.39	0
Denmark	1987								
	1992	-0.31	1	0.33	0	-0.31	1	0.33	0
	1995	-0.16	1	1.47	1	-0.50	1	1.72	1
	2000	0.52	1	0.69	1	-0.16	1	1.79	1
	2004	-0.16	1	1.52	0	-0.38	1	1.91	1
	2007	0.68	1	0.32	0	0.21	0	1.00	1
	2010	-0.52	1	-0.27	0	0.35	1	1.67	1
Finland	1987								
	1991	-0.14	1	-1.49	0	-0.14	1	-1.49	0
	1995	-0.50	1	-0.07	0	-0.59	1	-0.89	0
	2000	-0.13	0	3.90	0	-1.63	1	0.41	0
	2004	0.27	1	-0.17	0	-1.45	1	0.31	0
	2007	0.84	1	-0.43	0	-0.89	1	2.22	0

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Table 2 – *Continued from previous page*

		Year-to-Year				Cumulative			
Country	Year	Endow.	Sig.	Coef.	Sig.	Endow.	Sig.	Coef.	Sig.
	2010	-0.46	1	-0.40	0	-1.55	1	-26.75	0
France	1978								
	1984	1.01	1	3.14	1	1.01	1	3.14	1
	1989	0.05	0	2.61	1	0.61	0	0.58	0
	1994	-4.71	0	0.03	0	0.25	0	0.90	0
	2000	0.63	1	-1.20	0	1.32	1	0.31	0
	2005	0.22	0	0.00	0	1.67	1	-4.10	0
	2010	0.41	1	1.97	0	3.40	1	115.30	0
Germany	1973								
	1978	-0.88	1	-0.21	0	-0.88	1	-0.21	0
	1981	-0.20	0	-1.04	1	0.04	0	-0.83	0
	1983	-0.42	0	0.94	1	-1.94	0	-0.02	0
	1984	0.61	1	-0.96	1	-1.07	0	-0.66	1
	1989	0.86	1	0.49	0	0.67	0	-0.36	0
	1994	0.18	0	-0.42	0	-3.02	0	-0.55	1
	2000	0.82	1	0.16	0	-1.76	0	-0.41	0
	2004	-0.13	0	2.08	0	21.39	0	-0.08	0
	2007	0.41	1	0.23	0	-8.92	0	-0.15	0
	2010	0.09	0	4.56	0	-7.80	0	0.28	0
Israel	1979								
	1986	1.36	1	0.01	0	1.36	1	0.01	0
	1992	0.85	1	1.29	0	2.00	1	7.55	0
	1997	2.31	1	2.61	0	5.27	1	-0.40	0
	2001	-0.12	0	0.28	0	2.66	1	-0.16	0
	2005	0.50	0	-1.65	1	3.35	1	-1.80	0
	2007	0.71	0	0.94	0	5.23	1	-1.46	0
	2010	1.23	0	0.98	0	7.81	1	-0.98	0
Italy	1986								
	1987	0.04	0	-0.30	0	0.04	0	-0.30	0
	1989	0.06	0	1.89	1	0.00	0	0.76	0
	1991	0.68	0	21.04	0	0.71	0	-1.68	0
	1993	0.03	0	-3.48	1	0.50	0	-0.06	0
	1995	0.15	0	-0.45	0	0.27	0	-0.29	0
	1998	0.27	0	-0.34	0	0.72	0	2.02	0
	2000	-0.15	0	0.67	0	1.39	1	2.78	0
	2004	1.27	1	0.55	0	2.89	1	3.27	0
	2008	1.07	1	-0.52	0	4.01	1	2.64	0

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Table 2 – *Continued from previous page*

		Year-to-Year				Cumulative			
Country	Year	Endow.	Sig.	Coef.	Sig.	Endow.	Sig.	Coef.	Sig.
	2010	0.43	0	0.69	0	4.67	1	3.12	0
The Netherlands	1983								
	1987	0.32	1	0.73	0	0.32	1	0.73	0
	1990	8.14	0	1.30	0	0.30	1	-12.44	0
	1993	-1.74	0	0.18	0	0.72	0	-1.33	0
	1999	1.20	1	39.72	0	3.36	1	10.19	0
	2004	0.09	0	-1.73	1	3.73	1	1.04	0
	2007	0.27	0	0.58	0	3.99	1	2.03	0
	2010	0.54	0	2.74	0	5.67	1	3.06	1
Norway	1979								
	1986	-2.49	0	0.97	0	-2.49	0	0.97	0
	1991	0.62	0	0.45	0	2.44	0	1.52	1
	1995	-0.03	0	-0.50	0	0.83	1	0.62	0
	2000	0.32	0	2.90	0	0.71	1	0.69	1
	2004	0.03	0	0.57	0	0.60	1	0.41	0
	2007	0.18	1	3.02	0	0.74	1	-0.47	0
	2010	-0.07	1	0.14	0	0.61	1	-0.39	0
Poland	1986								
	1992	-19.17	0	-7.86	0	-19.17	0	-7.86	0
	1995	-0.02	0	-4.35	1	0.41	1	-5.20	1
	1999	0.65	1	3.22	1	-0.08	0	-2.51	1
	2004	-0.51	1	0.32	0	4.46	0	-3.09	1
	2007	0.29	1	-0.74	0	0.96	1	-3.13	1
	2010	0.22	1	-1.07	0	1.29	1	-2.40	1
Spain	1980								
	1985	0.19	0	-0.15	0	0.19	0	-0.15	0
	1990	0.30	1	1.13	0	-1.00	0	1.42	1
	1995	-3.16	0	-0.77	1	-5.15	0	1.10	0
	2000	1.41	1	0.50	0	2.43	1	-0.74	0
	2004	0.80	1	0.37	0	4.14	1	1.67	1
	2007	1.56	1	3.42	0	7.54	1	2.99	1
	2010	-0.84	1	0.02	0	6.81	1	3.07	1
Sweden	1981								
	1987	1.08	1	-4.61	0	1.08	1	-4.61	0
	1992	-0.41	1	0.49	0	0.43	1	-1.35	0
	1995	-0.25	1	-0.21	0	0.61	0	-1.44	0
	2000	0.64	1	2.19	0	-0.01	0	0.00	0

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Table 2 – *Continued from previous page*

		Year-to-Year				Cumulative			
Country	Year	Endow.	Sig.	Coef.	Sig.	Endow.	Sig.	Coef.	Sig.
	2005	-1.81	1	-15.23	0	-1.41	1	-4.73	1
United Kingdom	1974								
	1979	0.50	1	-0.25	0	0.50	1	-0.25	0
	1986	-0.69	1	-1.56	1	0.01	0	1.28	1
	1991	2.04	0	-1.22	0	1.44	1	27.36	0
	1994	-0.50	1	-1.01	0	0.45	0	0.58	0
	1995	0.48	1	-1.73	1	1.08	1	-0.49	0
	1999	0.43	1	1.24	1	2.65	1	1.78	0
	2004	0.59	1	0.36	0	4.48	1	-4.87	0
	2007	0.06	0	-0.24	0	15.68	0	1.78	0
	2010	0.54	0	4.29	0	35.34	0	-0.18	0
United States	1974								
	1979	0.50	1	-0.25	0	1.08	1	-0.22	0
	1986	0.79	1	0.29	0	2.27	1	-0.12	0
	1991	0.12	0	-4.44	0	3.41	1	1.48	1
	1994	0.78	1	-0.20	0	4.25	1	1.35	1
	1997	0.40	1	0.11	0	4.92	1	1.44	1
	2000	0.16	0	3.26	0	4.78	1	0.62	0
	2004	-0.43	1	0.54	1	4.57	1	1.46	1
	2007	0.19	1	1.07	0	5.13	1	2.07	1
	2010	-0.84	1	0.36	0	3.78	1	2.35	1
	2013	0.10	0	-0.56	0	4.00	1	1.95	1

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