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'Only a Husband Away from Poverty'? Lone Mothers' Poverty Risks in a European Comparison

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Veröffentlichungsversion / Published Version Sammelwerksbeitrag / collection article

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Empfohlene Zitierung / Suggested Citation:

Hübgen, S. (2018). 'Only a Husband Away from Poverty'? Lone Mothers' Poverty Risks in a European Comparison. In L. Bernardi, & D. Mortelmans (Eds.), *Lone Parenthood in the Life Course* (pp. 167-189). Cham: Springer International Publishing. <u>https://doi.org/10.1007/978-3-319-63295-7_8</u>

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Book Part — Published Version 'Only a Husband Away from Poverty'? Lone Mothers' Poverty Risks in a European Comparison

Provided in Cooperation with: WZB Berlin Social Science Center

Suggested Citation: Hübgen, Sabine (2018) : 'Only a Husband Away from Poverty'? Lone Mothers' Poverty Risks in a European Comparison, In: Bernardi, Laura Mortelmans, Dimitri (Ed.): Lone Parenthood in the Life Course, ISBN 978-3-319-63295-7, Springer International Publishing, Cham, pp. 167-189, http://dx.doi.org/10.1007/978-3-319-63295-7_8

This Version is available at: http://hdl.handle.net/10419/191918

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Chapter 8 'Only a Husband Away from Poverty'? Lone Mothers' Poverty Risks in a European Comparison

Sabine Hübgen

Introduction

In the EU at-risk-of-poverty rates¹ have been quite stable over the last decade (Eurostat 2014). However, some social groups – among them lone mothers – are disproportionately affected by income poverty. Sociologists explain this phenomenon largely referring to the term of "new social risks" meaning that welfare state institutions did not adjust properly to major demographic and social changes. Thereby, the case of lone mothers appears to be crucial, as their prevalence increased tremendously in the course of the pluralization of family forms over the last decades (European Commission 2007; Jaehrling et al. 2011). Despite this overall trend, we observe substantive variations in lone mothers' poverty risks across the EU member states (Brady and Burroway 2012; Christopher 2002; Lelkes and Zólyomi 2008; Misra et al. 2007): The at-risk-of-poverty rates vary between 13% in Denmark and 49% in Luxembourg (see Table 8.2). Moreover, the at-risk-of-poverty rates for lone mothers do not necessarily reflect a country's overall at-risk-of-poverty rate. In the Czech Republic, for instance, the overall at-risk-of-poverty rate is comparatively low, whereas the at-risk-of-poverty rate for lone mothers ranks among the highest. Similarly, while German lone mothers' poverty risk is twice as high as that of the overall population; Danish lone mothers face even lower poverty risks than the overall population. These descriptive numbers already reveal that an absent partner per se cannot account for this striking variation in lone mothers' poverty risks. On the contrary, it appears rather to be an indicator for to which extent a lone mother is capable of providing a decent standard of living to herself and her children in a specific country (Hobson 1994:171). From previous research we know that besides

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¹This term refers to the EU's At-risk-of-poverty-rate at the 60% threshold.

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individual factors (e.g. age, work status, education, the age and number of kids) also institutional contexts play an important role for understanding lone mothers' poverty risks (Brady and Burroway 2012; Huber et al. 2009; Misra et al. 2007, 2012). Though, from a theoretical point of view the mechanisms of these associations remain rather unclear.

Hence, this chapter aims to shed some more light on the influence of institutional configurations on lone mothers' poverty risks. Institutional arrangements shape the individual's scope of action in both structural and normative regards. With respect to lone mothers' poverty risks, the labor market on the one hand and the welfare state on the other constitute the two key institutions: they determine to what extent lone mothers have either access to labor income and/or social transfers. On theoretical grounds this chapter builds upon the prolific work of gender-sensitive welfare state research. One major argument is that high at-risk-of-poverty rates for lone mothers can be interpreted as an indicator for high gender inequalities because those mothers seem to be unable to making ends meet without a male partner in the household (Hobson 1994). This assumption will be tested empirically focusing on gender inequalities in the labor market and the welfare state. Furthermore, I want to investigate the interplay of these institutional configurations with relevant individual characteristics for poverty outcomes. Data stem from multiple waves (2009-2012) of the EU Statistics on Living and Income Conditions (EU-SILC). Addressing the hierarchical data structure multi-level models are estimated in the multivariate analyses.

Theory and Hypotheses

Over the last decades the proportion of lone parents on all families has been visibly increasing (European Commission 2007). In some European countries lone parents - but mainly lone mothers - represent between 20% and 25% of all families (Jaehrling et al. 2011; Kiernan et al. 2011). However, lone motherhood is still largely considered either as predictor for overall poverty (Brady et al. 2009; Lelkes and Zólyomi 2008; Vandecasteele 2011) or studies emphasize the negative consequences for children growing up in lone parent families (Brooks-Gunn et al. 2002; Kiernan et al. 2011; Sawhill 2003, 2014). There also exist some rich descriptive case studies which focus on lone mothers' family life, employment patterns, welfare reception sometimes also taking lone mothers' poverty risks into account (Bahle et al. 2013; Fux 2011; Heimer et al. 2009; Jaehrling et al. 2011; Ott et al. 2011; Zagel 2014). Other studies inspired by the life course perspective refer implicitly to lone mothers investigating the economic consequences of risky life events - family break-ups among them (Andreß et al. 2006; Kohler et al. 2012; also see Harkness and Mortelmans and Defever in this book, Radenacker 2011). Comparative studies which explicitly attempt to explain lone mothers' poverty risks are still rare. The poverty literature in general differentiates between individual and structural causes of becoming poor. Well established individual poverty predictors like age, age and number of children, marital status, level of education, employment status and working hours are also crucial for lone mothers' poverty risks (Brady and Burroway 2012; European Commission 2007; Fux 2011; Jaehrling et al. 2011; Lelkes and Zólyomi 2008; Misra et al. 2007, 2012; Ott et al. 2011). This is particularly true as there is no (male) partner on the household level who could level off (at least some of) the disadvantages. Regarding structural explanations of lone mothers' poverty risks, in previous studies particularly characteristics of the labor market and the welfare state turned out to be important.

The Labor Market

For instance, being employed would generally reduce a lone mother's poverty risk significantly. However, her employment status and working hours are not only dependent on individual qualifications and decisions, but also on characteristics of the labor market. These characteristics are embedded in and shaped by a specific historical, political and normative context. In countries with a long tradition of female labor force participation it is easier for (lone) mothers to get access to paid work and longer hours than in countries with a strong tradition of the 'male breadwinner-model'. In fact, nowadays the majority of women in Europe are employed, but in many countries we can still observe a clearly gendered responsibility for childcare. These gendered norms do not only lead to the so called 'double burden' for mothers, but also to a 'motherhood penalty' – i.e. economic disadvantages in career development and earnings compared to childless women or to fathers (Benard and Correll 2010; Gangl and Ziefle 2009; Grunow et al. 2011).

Hence, lone mothers' poverty risks might vary between countries dependent on the structural characteristics of the labor market – and particularly gender inequalities. In a first step existing gender inequalities in the labor market have an impact on the access to paid work for women and especially for mothers. Consequently, in some countries the access to labor income is much more equal than in others. In a second step, countries might differ regarding the degree of occupational sex segregation - in which types of occupations, positions and working conditions women can find a job (Grunow et al. 2011; Mandel and Semyonov 2006). Thereby, 'femaletypical' occupations are often characterized by relatively low earnings and working hours and meager career opportunities (Bardasi and Gornick 2008). This in turn results in (long-term) poverty risks. Similarly, Jaehrling et al. (2011: 53) point to the fact that part time work often stands either for a "revolving door" into unemployment or for a "dead end street" cumulating all the corresponding disadvantages over time. On this basis I want to test empirically whether existing gender inequalities in the labor market have an effect on lone mothers' poverty risks: The more pronounced gender inequalities - referring to the access, working hours and earnings exist in the labor market, the higher are lone mothers' poverty risks in the respective country (Hypothesis 1a).

The Welfare State

Besides the role of the labor market, many studies found welfare state generosity to be a crucial predictor for poverty in general (Brady et al. 2009; Esping-Andersen 1990; Huber et al. 2009; Misra et al. 2007; Smeeding 2005). Some researchers criticize the concept of generosity - largely measured as social spending -, as it does not take into account the political objectives and the quality of the programs (Misra et al. 2007: 806). Hence, more recent studies investigate the influence of specific policies or laws on poverty. As an example, Brady and Burroway (2012: 738) show that lone mothers' poverty risks depend on whether a welfare state's organization is based on the principle of universalism and citizenship versus a strong emphasis on 'targeting'. Furthermore, feminist scholars argue that social rights and eligibility rules are not gender-neutral, so that welfare states reproduce gender inequalities (Orloff 2009; Sainsbury 1999). Clearly, this can be closely linked to the organizational principle of welfare states because social rights based on citizenship leave only little room for gender discrimination. On the contrary, in countries like Germany with a strong focus on earnings-related social insurances, persons without a life-long standard employment relationship are systematically disadvantaged. Hereby particularly mothers are affected when they interrupt their careers right after the birth of a child. Similarly, eligibility rules also can vary by marital status providing certain privileges to married couples. This is also very relevant for lone mothers because in some countries divorced or widowed lone mothers have access to more generous social benefits than never married lone mothers (Hobson 1994: 182).

So far, the impact of gender-specific eligibility rules has not been tested empirically. Beyond that, existing work-family-policies are particularly important for lone mothers as they shape their possibilities to reconcile paid labor work and unpaid care work. Admittedly, this policy area is strongly affected by existing gender norms and role models (Pfau-Effinger 2004, 2005). This can be perfectly illustrated by the example of public childcare: While in most European countries care for children from the age of three is largely provided, in some countries care for the younger is strongly debated and the coverage is consequently still very low. The results by Misra et al. (2007, 2012) indicate that generous family benefits on the one hand and a broad supply of public childcare on the other reduce lone mothers' poverty risks substantively. In contrast, the effects of paternity leave policies are mixed: A generous replacement rate can reduce poverty risks right after birth, but it can have the reversed effect if long leaves are granted (Aisenbrey et al. 2009, ebd: 2007, Jaehrling et al. 2011, Mandel and Semyonov 2006). Building on previous literature I assume that the more pronounced gender inequalities exist in the welfare state - in terms of gender-specific eligibility rules and insufficient work-family policies -, the higher lone mothers' poverty risks in the respective country (Hypothesis 1b).

The Interplay of Institutional Configurations and Individual Characteristics

One shortcoming of previous research consists in that the impact of individual characteristics and institutional configurations on lone mothers' poverty risks have been investigated quite independently of each other. As a consequence, the exact interplay of individual characteristics in specific country contexts is still unclear. This chapter aims at closing this gap at least partly: With regard to lone mothers' employment I argue that its poverty-reducing impact is not only dependent on individual characteristics like qualifications, but also on the extent of existing gender inequalities on the labor market. More explicitly, the more pronounced gender inequalities are regarding working hours and earnings, the higher are lone mothers' poverty risks despite of being employed (*Hypothesis 2*).

Similarly, the poverty-enhancing effect of children might not be identical across Europe due to varying degrees of gender inequalities in terms of work-family policies. In countries where care is clearly ascribed to the family sphere – thus to the mothers –, welfare states will only provide rudimentary public childcare. Hence, I assume that the more traditional work-family-policies are in a country, the greater young children's poverty-enhancing impact on lone mothers (*Hypothesis 3*).

Data, Measures and Methods

Data & Sample

Individual data are pooled together from four EU-SILC waves (2009–2012). In doing so, a reasonable number of lone mothers per country is obtained. Bulgaria, Croatia, Cyprus, Malta and Romania are excluded either due to low case numbers (<400) or major data issues. The final country sample covers 25 European countries, country-level characteristics stem from the Eurostat data base. Lone mothers are defined as follows²: A woman who lives only with her dependent child(ren). The term 'dependent' here include all children below the age of 18 and children up to the age of 24 when either in education or unemployment. Mothers identified as 'living-apart-together' with a husband are excluded from the sample, as we can assume them to form an economic unit. Moreover, the sample is restricted to lone mothers aged 18–59 years. The final sample counts 28,738 lone mothers from 25 countries.

²This 'narrow' definition excludes for example lone mothers living with their parents or with adult children. However, in all sample countries (except Poland and Slovakia) the vast majority of lone mothers live only together with their dependent children. Moreover, this chapter focuses on the relationship between institutional gender inequalities and poverty. Therefore, it is preferable to not confound these mechanisms with others stemming from different HH constellations.

Measures

Following the official EU definition, a lone mother is defined as *being at risk of poverty* if her net household income sums up to less than 60% of a country's respective median of the national net equivalent household income. As I am interested in the influence of national differences regarding institutional configurations, a relative definition of poverty seems to be adequate. The dependent variable is coded as a dummy, poor (=1) or not poor (=0).

Lone mothers' individual characteristics are measured as follows: self-defined³ *employment status and working hours* are combined in 4 dummy variables: full time employed, part time employed, unemployed and inactive. Further, the *total number of children* (1; 2; 3 or more) and the presence of *very young children* (0–2 years) are included. Besides, models will control for level of education (high, medium, low), marital status (never married, divorced, widowed) and mother's age (in years).

Existing gender inequalities in the labor market and the welfare state are captured by several indicators (see Table 8.1 for an overview: The gender-specific access to paid labor is measured as the *Female Labor Force Participation* Rate, whereas two indicators of occupational sex segregation are included: the *Gender Pay Gap* and the *Female Full Time Employment Rate* as a share of the female labor force. Furthermore, work-family policies are represented by the *Provision of Childcare* (childcare usage rate for children up to the age of 3) and *Family Benefit Generosity* (in PPPs per capita). The degree of *Gender-specific Eligibility* rules in the welfare state is measured as the share of social contributions on total social protection receipt. Finally, I will control for the overall working age at-risk-of-poverty rate because on the one hand it nets out the specific poverty risks of lone mothers from general poverty risks. On the other hand it serves as an indirect indicator for overall welfare state effectivity across countries.

Analytical Strategy

The empirical analyses start out with a short descriptive overview on lone mothers' at-risk-of-poverty rates across the 25 countries in comparison to the overall population and partnered mothers. The following sections will analyze to what extent individual and institutional factors and finally the interplay of both can account for this variation in lone mothers' poverty risks. First, lone mothers' social composition across countries will be presented. It might be the case that in some countries particularly socially disadvantaged women become lone mothers, whereas in other countries this family form is less negatively selected. Thus, some of the country

³A self-defined status seems to be superior because there are no universal thresholds across occupations and countries. However, 'full time' is usually reported when working for at least 30 hours per week (Eurostat 2009: 177).

	Female labor force participation	Female fulltime employment	Gender pay gap	Childcare usage	Family benefit generosity	Share of social contributions	Overall AROP rate
AT	66.65	56.62	23.85	11.5	697.65	62.76	18.48
BE	56.50	57.44	10.13	39.00	516.21	62.20	20.33
CH	73.25	40.17	18.33	26.50	429.49	65.24	14.10
CZ	57.10	91.34	23.03	3.25	229.21	73.69	14.93
DE	66.80	54.84	22.38	21.75	653.76	62.73	21.13
DK	71.05	62.98	15.98	73.00	486.71	22.28	19.70
EE	62.93	86.70	27.90	20.75	328.84	80.27	22.70
ES	52.48	77.11	17.53	37.25	136.62	55.87	27.08
FI	67.60	80.96	20.03	27.50	459.37	47.75	17.05
FR	59.80	70.06	15.45	42.00	460.25	62.42	19.90
HU	50.80	91.79	18.20	8.00	373.44	55.88	31.65
IE	55.85	65.49	13.15	23.33	850.92	31.91	28.90
IS	76.78	66.71	18.18	40.75	384.64	42.25	13.18
IT	46.53	70.72	5.83	23.50	191.14	53.18	27.10
LT	60.23	90.36	13.60	9.50	252.24	65.80	32.05
LU	57.53	64.10	8.80	40.50	1854.02	50.42	18.38
LV	60.33	89.51	14.00	17.25	154.12	56.53	37.13
NL	70.28	23.68	17.78	49.25	237.06	66.39	16.58
NO	73.73	57.71	15.90	44.00	561.61	47.56	15.90
PL	52.80	89.28	6.10	3.25	125.55	61.59	27.40
PT	60.28	86.63	12.75	36.00	167.78	44.09	24.50
SE	70.73	60.28	15.70	54.25	456.49	45.87	15.48
SI	61.95	87.46	1.20	35.75	328.48	65.02	18.13
SK	52.58	94.77	20.88	3.75	305.80	60.09	20.08
UK	64.80	57.72	19.83	33.00	325.31	40.68	21.80

Table 8.1 Overview of gender inequality indicators and the overall at-risk-of-poverty rate across25 countries

Source: Eurostat Database based on data from European Labour Force Survey and EU-SILC Note: Displayed values are averaged across the years 2009–2012. *AROP*= At-risk-of-Poverty Rate

variation in lone mothers' poverty risks could be a result of different selection processes leading to lone parenthood. Then, institutional configurations focusing on gender inequalities will be illustrated and linked to lone mothers' at-risk-of-poverty rates across countries.

Building on these descriptive parts, several multi-level models are employed for hypothesis-testing. Multi-level procedures allow the simultaneous modelling of individual and higher level factors on an individual criterion variable addressing some major statistical challenges regarding mixed level analysis (e.g. correct standard errors). Furthermore, the interplay of both individual and context characteristics can be modelled with so called 'Cross-level interactions' in Random Slope Models. Random Slope Models allow specific coefficients to vary across countries. Cross-level interactions prove whether this added variance can be 'captured' by country-level characteristics – in this case by gender inequalities in the labor market and the welfare state. This procedure is used for testing Hypothesis 2 and 3. Despite the binary outcome variable (poor/not poor), the models are specified as linear probability models with robust standard errors. Following Mood (2010) this procedure addresses the problem of counterintuitive and misleading interpretation stemming from Logits or Odds Ratios. Furthermore, logistic multi-level models suffer repeatedly from convergence problems, especially when running more complex Random Coefficient Models.

Descriptive Findings

Lone Mothers' At-Risk-of-Poverty Rates & Poverty Ratios

An overview of lone mothers' at-risk-of-poverty (AROP) rates is presented in Table 8.2 compared to overall and partnered mothers' AROP rates and the respective poverty ratios. Almost one third of the lone mothers (31%) in this country sample are at risk. As mentioned above, lone mothers' AROP rate is highest in Luxembourg (49%) and lowest in Denmark (13%). Countries fit only partly into well-known welfare state typologies: In three Scandinavian countries (DK, FI, NO) comparatively few lone mothers face poverty risks, whereas the Swedish AROP rate for lone mothers lies above average AROP rates and resembles more the British one. Similarly, among the high poverty countries two 'conservative' welfare states (DE, LU) cluster together with Lithuania, Latvia and Spain. As expected the so called 'liberal' welfare states of UK and Ireland show AROP rates for lone mothers above average, but they are not among the highest.

Table 8.2 also provides the ratios of lone mothers' poverty risks compared to overall poverty risks and that of partnered mothers. These poverty ratios also point in the direction that lone mothers' poverty underlies specific mechanisms: In almost all countries lone mothers face higher risks of poverty than the overall working age population. In the Czech Republic and Luxembourg for example lone mothers' AROP rate is 2.5 times higher. Even more pronounced are the differences in AROP rates between lone and partnered mothers. On average, lone mothers face 2.8 times higher poverty risks than their partnered equivalents. This poverty ratio is particularly high (>4) in the Czech Republic, Norway, Germany and Sweden. Maybe surprisingly, in the Southern European countries and Poland AROP rates for lone and partnered mothers are quite similar. It is also in these countries where other living arrangements are quite common among lone mothers.

So it might be the case that the sample lone mothers for these countries form a rather specific group which can afford to live without other family members and therefore do not differ significantly from partnered mothers.

	At-risk-of-pover	ty rates		Poverty	ratios
	Lone mother	Working-age population	Partnered		
Country	(1)	(2)	mothers (3)	(1)/(2)	(1)/(3)
LU	49.43	18.38	15.13	2.69	3.27
LT	42.08	32.05	16.81	1.31	2.5
DE	40.77	21.13	9.57	1.93	4.26
ES	38.36	27.08	22.02	1.42	1.74
LV	36.50	37.13	18.01	0.98	2.03
IT	36.12	27.10	20.00	1.33	1.81
CZ	35.41	14.93	8.17	2.37	4.33
BE	34.29	20.331	11.10	1.69	3.09
UK	33.61	21.80	12.52	1.54	2.68
SE	33.48	15.48	7.92	2.16	4.23
EE	32.89	22.70	13.62	1.45	2.41
IE	32.87	28.90	11.99	1.14	2.74
FR	31.00	19.90	12.54	1.56	2.47
NL	30.75	16.58	8.04	1.86	3.82
SI	30.10	18.13	9.06	1.66	3.32
PL	29.43	27.40	16.82	1.07	1.75
РТ	28.37	24.50	16.83	1.16	1.69
СН	28.30	14.10	12.51	2.01	2.26
HU	27.39	31.65	13.48	0.87	2.03
AT	26.91	18.48	9.30	1.46	2.89
SK	26.67	20.08	12.07	1.33	2.21
IS	22.88	13.18	5.77	1.74	3.96
NO	22.50	15.90	5.25	1.42	4.29
FI	20.02	17.05	7.46	1.17	2.68
DK	12.95	19.70	6.44	0.66	2.01
Total	31.32	21.74	12.00	1.52	2.82

 Table 8.2
 At-risk-of-poverty rates and ratios for lone and partnered mothers and the overall population

Notes: Weighted At-risk of-poverty rates; N = 25. Countries sorted by Lone Mothers' AROP Rate (descending). *AROP* = At-risk-of-Poverty rate

Social Composition and Lone Mothers' Poverty Risks

A first potential explanation of this great variation in lone mothers' poverty risks across countries could be different selection⁴ processes leading to lone motherhood in different countries. Table 8.3 in the Appendix presents the share of 'risky' characteristics among lone mothers across countries. The column 'Number of risks'

⁴The most preferable modelling strategy would be a Heckman selection correction (Heckman 1979). In practice however, it is quite challenging to find a suitable instrument variable which is correlated with lone motherhood, but not with poverty outcomes. Therefore, I employ a more descriptive approach to detect the role of lone mothers' social composition for their poverty risks.

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BE 7.17 10.6 19.37 3.03 6.43 6.23 3.420 FE $2.2.11$ 4.446 903 3.860 61.78 1.33 1.40 6 3.287 FR 9.31 $1.2.35$ 12.44 6.903 3.860 61.78 1.330 6.92 3.042 6.23 3.04 5.339 14.77 5 3.287 IU 11.74 14.25 12.66 42.12 3.10 5.234 56.57 8.43 11.16 5 3.043 IU 13.36 13.21 12.26 42.72 56.77 8.43 11.16 5 3.346 IU 13.36 12.26 22.34 56.77 8.43 11.16 5 23.46 IU 13.60 12.26 12.74 8.43 11.16 5 33.46 IU 51.2 10.602 18.21 10.77 12.24		Young age	Inactive	Unemployed	Low educated	Never married	5+ children	Child < 3 years	N [~] OT IISKS	AKUP rate
IE 2.11 4.46 9.03 3.60 6.78 $2.3.9$ 1.80 6 2.38 IF 9.31 1.14 6.89 30.42 6.84 11.11 1605 6 $2.3.8$ IV 1.13 1.25 12.54 23.30 39.91 1.76 5.7 4.92 11.40 5 43.00 IV 1.391 20.71 302 25.24 56.57 8.43 11.16 5 23.60 XI 13.30 20.71 302 55.24 55.72 500 52.63 XI 13.36 11.23 12.28 12.38 50.75 50.75 50.75 XI 3.36 13.21 14.22 12.48 51.30 12.33 10.75 52.25 33.60 XI 3.36 11.16 13.21 14.22 12.48 51.33 10.75 22.54 YI 51.7 </td <td>BE</td> <td>7.17</td> <td>19.6</td> <td>19.37</td> <td>32.03</td> <td>40.43</td> <td>10.21</td> <td>11.49</td> <td>6</td> <td>34.29</td>	BE	7.17	19.6	19.37	32.03	40.43	10.21	11.49	6	34.29
IS $ $	E	22.11	44.46	9.03	38.60	61.78	23.39	14.80	6	32.87
FR98112.3512.5423.3949.9311.3611.40531.001U11.7414.2512.6642.1234.7014.3414.77549.43VU11.7414.2512.6642.1235.0216.578.4311.16522.55VU13.9130.7130.225.2456.578.4311.16553.20VT13.6613.2114.2219.2435.007.8210.12426.91SE11.1613.237.7851.6610.2110.7343.348VL98432.364.5727.1734.3715.2110.7343.348VL98411.6624.5127.1734.3715.2110.7343.348VL98432.364.5727.1734.3715.2110.7343.348VL98432.364.5727.1734.3715.2110.73336.50VL98411.6624.5127.1734.3715.2110.73336.50VL98411.618859.6641.466.967.50222VL96613.5911.6113.9910.8610.2310.36222VL96613.5911.618.7911.3710.702222VL96613.5913.94 <td< td=""><td>IS</td><td>19.37</td><td>31.14</td><td>6.89</td><td>30.42</td><td>64.84</td><td>11.11</td><td>16.05</td><td>6</td><td>22.88</td></td<>	IS	19.37	31.14	6.89	30.42	64.84	11.11	16.05	6	22.88
LU 11.74 14.25 12.66 42.12 3.10 5.71 5.70 54.43 11.16 5 22.5 NO 13.91 20.71 3.02 55.24 56.57 8.43 11.16 5 22.5 UK 23.50 38.49 7.26 18.72 53.02 56.57 8.43 11.16 5 23.54 NE 11.16 13.21 14.22 19.24 58.60 7.82 10.12 4 2.691 NE 11.16 13.23 7.86 24.51 57.17 34.37 64.1 589 3 2.691 NL 9.84 23.36 4.57 27.17 34.37 64.1 589 3 30.75 NL 9.84 11.45 15.09 14.91 27.42 81.19 10.73 39.569 NL 11.45 15.09 14.91 27.42 81.19 10.73 39.569 NL 11.45 11.94 12.90 14.91 27.42 81.19 10.73 28.37 NL 8.79 12.14 14.96 27.42 81.9 10.28 39.569 NL 11.45 11.61 8.85 9.66 14.46 59.67 29.43 NL 57.14 11.45 10.81 20.759 27.92 29.43 NL 57.16 11.46 59.67 59.66 27.50 27.20 29.43 NL 56.16 18.29 10.81 10.96 20.65 <td>FR</td> <td>9.81</td> <td>12.35</td> <td>12.54</td> <td>23.39</td> <td>49.93</td> <td>12.36</td> <td>11.40</td> <td>S</td> <td>31.00</td>	FR	9.81	12.35	12.54	23.39	49.93	12.36	11.40	S	31.00
NO $ $	ΓΩ	11.74	14.25	12.66	42.12	34.70	14.34	14.77	5	49.43
UK 23.50 38.49 7.26 18.72 53.02 16.02 18.92 5 33.61 AT 13.66 13.21 14.22 19.24 38.60 782 10.12 4 26.91 SE 11.16 13.23 778 12.48 51.66 10.21 10.73 4 26.91 DK 51.2 16.81 11.66 24.51 52.73 641 5.89 3 30.75 VL 9.84 $3.23.6$ 4.57 27.17 34.37 6.41 5.89 3 30.75 VL 5.16 11.66 24.51 52.73 6.41 5.89 3 30.75 VL 5.14 10.66 14.91 27.17 8.19 11.16 3 30.75 VL 11.45 11.06 24.51 27.62 8.19 11.16 3 30.56 VL 12.14 11.04 8.79 25.17 27.62 8.19 11.16 2 20.02 VL 20.11 8.79 25.17 42.01 19.77 50.62 20.20 20.23 VL 8.79 12.88 10.86 10.86 12.86 12.64 13.99 6.03 2 20.02 VL 35.76 8.10 13.99 10.26 20.12 20.12 20.12 VL 26.7 8.10 13.99 10.26 20.12 20.12 20.12 VL 26.7 8.64 12.96 12.66 2	NO	13.91	20.71	3.02	25.24	56.57	8.43	11.16	S	22.5
MT 13.66 13.21 14.22 19.24 38.60 7.82 10.12 4 26.91 SE 11.16 13.23 7.78 12.48 51.66 10.21 10.73 4 26.91 DK 5.12 16.81 11.66 24.51 52.73 6.41 5.89 3 33.48 DK 5.12 16.81 11.66 24.51 52.73 64.1 5.89 3 30.75 VL 9.84 32.36 4.57 27.17 34.37 15.21 674 3 3 30.75 VL 12.14 11.45 18.07 50.63 31.24 9.48 11.16 3 30.75 VL 12.14 11.45 18.07 50.63 31.24 9.48 11.16 3 30.75 ES 501 8.79 12.49 14.91 27.42 8.19 10.28 3 30.75 FI 961 8.79 10.28 8.19 10.28 36.72 11.16 32.96 32.76 32.32 50.92 HU 606 18.62 11.28 16.35 38.72 11.37 700 22 22.43 HU 606 18.21 10.90 38.72 11.37 700 22 20.43 HU 606 18.21 10.28 38.72 11.37 700 22 20.43 HU 606 18.22 10.28 36.75 58.33 10.266 <	UK	23.50	38.49	7.26	18.72	53.02	16.02	18.92	S	33.61
SE11.1613.237.7812.4851.6610.2110.734 33.48 DK5.1216.8111.6624.5152.736.415.89312.95NL9.8432.364.5727.1734.3715.216.7433.0.75PT6.513.3318.0750.6331.249.4811.1633.6.9PT12.1411.4515.0914.9127.428.1910.2833.6.9EE15.511.618.8596641.466.967.5023.5.9EF15.511.618.8596641.466.967.5022.9.69F196113.5910.8113.910.8119.776.795.1622.9.3F196113.5910.8113.938.7211.377.0022.9.43F196113.5910.8113.938.7211.377.0022.9.43F196113.5910.8315.6413.936.0322.9.43F13.5714.728.6429.6311.377.00229.43F13.6418.2110.099.3515.6413.9310.36229.43F13.6418.2110.099.3515.6413.9310.36229.43F13.6418.2110.099.3514.3512.498	AT	13.66	13.21	14.22	19.24	38.60	7.82	10.12	4	26.91
DK 5.12 16.81 11.66 24.51 52.73 6.41 5.89 3 12.95 NL 9.84 32.36 4.57 27.17 34.37 15.21 6.74 3 30.75 PT 6.51 3.33 18.07 50.63 31.24 9.48 11.16 3 30.75 LV 12.14 11.45 15.09 14.91 27.42 8.19 10.28 3 36.50 EF 15.5 11.61 8.85 9.66 41.46 6.96 7.50 2 23.37 EF 15.5 11.61 8.85 9.66 41.46 6.96 7.50 2 23.39 EV 12.14 11.45 12.90 14.91 27.42 8.19 10.28 3 36.50 FI 9.61 8.79 25.17 42.01 19.77 6.96 7.50 2 22.39 HU 6.06 18.62 11.28 16.37 12.37 10.28 20.02 HU 6.06 18.21 10.39 16.37 12.37 20.13 20.26 HU 6.06 18.22 10.90 23.52 21.64 12.37 20.62 20.23 HU 6.06 18.22 10.90 23.52 21.64 12.37 20.66 22.64 L 24.88 18.30 12.32 22.43 22.43 22.43 22.43 L 24.88 18.12 12.92 22.43 22.43 <	SE	11.16	13.23	7.78	12.48	51.66	10.21	10.73	4	33.48
NL 9.84 32.36 4.57 27.17 34.37 15.21 6.74 3 3 30.75 PT 6.51 3.33 18.07 50.63 31.24 9.48 11.16 3 3 30.75 LV 12.14 11.45 15.09 14.91 27.42 8.19 10.28 3 3 56.50 EE 15.5 11.61 8.85 9.66 41.46 6.96 7.50 2 2 23.39 EF 15.5 11.61 8.85 9.66 41.46 6.96 7.50 2 2 23.289 EF 15.5 11.61 8.85 9.66 41.46 6.79 51.6 2 2 23.289 EV 8.79 12.51 42.01 19.77 27.42 8.19 10.28 2 2 23.289 EV 8.79 12.59 10.81 13.99 6.79 51.67 2 2 2 2 HU 6.06 18.62 11.28 16.35 27.65 5.83 10.36 2 2 2 PL 7.48 18.21 10.00 9.35 20.13 11.37 7.05 2 2 2 2 PL 7.48 18.21 10.00 9.35 20.13 10.36 2 2 2 2 2 PL 7.48 18.21 10.00 18.39 10.36 2 2 2 2 2 2 <td>DK</td> <td>5.12</td> <td>16.81</td> <td>11.66</td> <td>24.51</td> <td>52.73</td> <td>6.41</td> <td>5.89</td> <td>б</td> <td>12.95</td>	DK	5.12	16.81	11.66	24.51	52.73	6.41	5.89	б	12.95
PT 6.51 3.33 18.07 50.63 31.24 9.48 11.16 3 28.37 LV 12.14 11.45 15.09 14.91 27.42 8.19 10.28 3 2.53 EE 15.5 11.61 8.85 9.66 41.46 6.96 7.50 2 23.89 EV 8.79 25.17 42.01 19.77 6.79 5.16 2 23.83 FI 9.61 8.79 25.17 42.01 19.77 6.79 5.16 2 23.83 HU 6.06 8.79 25.17 42.01 19.77 6.79 5.16 2 23.36 HU 6.06 18.62 11.28 16.35 11.37 7.00 2 27.39 HU 6.06 18.62 11.28 16.35 27.65 5.83 10.36 27.39 PL 7.48 18.21 10.28 16.35 5.83 10.36 27.39 27.39 VL 7.48 8.10 8.29 27.65 5.83 10.36 22.39 27.39 VL 7.48 8.10 18.23 10.28 27.65 8.28 27.65 28.33 VL 2.40 13.79 12.37 12.37 23.69 22.46 22.46 22.46 22.46 22.46 22.46 VL 2.40 11.10 23.79 23.79 22.46 22.46 22.46 22.46 22.46 DE 8.14 <th< td=""><td>NL</td><td>9.84</td><td>32.36</td><td>4.57</td><td>27.17</td><td>34.37</td><td>15.21</td><td>6.74</td><td>б</td><td>30.75</td></th<>	NL	9.84	32.36	4.57	27.17	34.37	15.21	6.74	б	30.75
$\rm VV$ 12.14 11.45 5.09 14.91 27.42 8.19 10.28 3 36.50 $\rm EE$ 15.5 11.61 8.85 9.66 41.46 6.96 7.50 2 23.83 $\rm EN$ 8.79 25.17 42.01 19.77 6.96 7.50 2 38.36 $\rm FI$ 9.66 18.62 11.83 25.17 42.01 19.77 6.96 7.50 2 38.36 $\rm HU$ 6.06 18.62 11.28 16.35 15.64 13.37 7.00 2 20.02 $\rm HU$ 6.06 18.62 11.28 16.35 27.65 5.83 10.36 2 20.02 $\rm PL$ 7.48 18.21 10.00 9.35 20.13 12.37 7.06 2 20.43 $\rm PL$ 7.48 18.21 10.00 9.35 20.13 12.37 7.05 2 20.43 $\rm PL$ 7.48 18.21 10.00 9.35 20.13 12.37 7.05 2 20.43 $\rm PL$ 14.72 8.10 12.49 $5.4.55$ 5.82 20.43 20.43 $\rm PL$ 11.82 12.32 11.81 17.03 12.34 20.43 $\rm PL$ 240 11.82 12.49 $5.4.55$ 8.28 2 20.43 $\rm PL$ 240 11.81 17.03 12.49 8.13 7.96 1 20.43 $\rm PL$ 10.40 21.83 14	PT	6.51	3.33	18.07	50.63	31.24	9.48	11.16	c,	28.37
EE $1.5.5$ 11.61 8.85 9.66 41.46 6.96 7.50 2 32.89 ES 5.01 8.79 25.17 42.01 19.77 6.79 5.16 2 38.36 FI 9.61 13.59 10.81 13.9 38.72 11.37 7.00 2 38.36 HU 6.06 18.62 11.28 16.35 15.64 13.93 6.03 2 20.02 PL 7.48 18.62 11.28 16.35 27.65 5.83 10.36 2 20.02 PL 7.48 18.21 10.00 9.35 27.65 5.83 10.36 2 20.36 PL 7.48 18.21 10.00 9.35 27.65 5.83 10.36 2 20.36 VI 7.48 18.21 10.00 9.35 20.13 12.37 706 2 20.35 VI 2.49 18.39 10.20 9.35 20.13 17.03 20.36 20.43 VI 2.40 8.10 6.55 8.28 8.28 22.40 8.13 706 1 20.22 DE 8.14 10.40 21.18 14.13 35.90 5.11 5.46 1 DE 8.14 10.40 21.18 14.13 35.90 5.11 5.46 1 DE 8.14 10.40 21.88 8.84 4.13 30.79 20.79 20.70 1 10.70 Dial<	LV	12.14	11.45	15.09	14.91	27.42	8.19	10.28	б	36.50
ES 5.01 8.79 25.17 42.01 19.77 6.79 5.16 2 38.36 HU 6.06 18.59 10.81 13.9 38.72 11.37 7.00 2 38.36 HU 6.06 18.62 11.28 16.35 15.64 13.93 6.03 2 20.22 PL 7.48 18.62 11.28 16.35 27.65 5.83 10.36 2 29.43 PL 7.48 18.21 10.00 9.35 27.65 5.83 10.36 2 36.12 PL 7.48 18.21 10.00 9.35 20.13 12.37 705 2 29.43 PL 7.48 18.21 10.00 9.35 20.13 12.37 705 2 36.12 OH 18.21 10.00 9.35 20.13 12.37 705 2 29.43 VI 2.40 18.39 12.40 54.55 6.55 8.28 29.43 OH 11.82 3.52 11.10 4.35 11.10 4.35 11.10 22.43 DE 8.14 10.40 21.18 14.13 35.90 5.11 546 1 29.64 DE 8.14 10.40 21.18 14.13 35.90 5.11 546 1 20.72 DE 8.14 10.40 21.83 36.75 37.70 21.67 21.66 22.66 DE 8.14 10.11 16.72 <th< td=""><td>EE</td><td>15.5</td><td>11.61</td><td>8.85</td><td>9.66</td><td>41.46</td><td>6.96</td><td>7.50</td><td>2</td><td>32.89</td></th<>	EE	15.5	11.61	8.85	9.66	41.46	6.96	7.50	2	32.89
HI9.6113.5910.8113.938.7211.377.00220.02HU6.0618.6211.2816.3515.6413.936.03220.03TT3.5714.728.6429.6327.655.8310.36220.39PL7.4818.2110.009.3527.655.8310.36220.43PL7.4818.2110.009.3527.655.8310.36220.43OL1.4818.2110.009.3527.658.8310.36220.43VL2.4018.2110.009.3520.1311.104.35220.43CH2.4011.823.5211.8117.0311.104.3522DE8.1410.4021.1814.1335.905.115.4612DE8.1410.4021.1814.1335.905.115.4612DE8.1410.4021.1814.1335.905.115.4612DE8.1410.4021.1814.1335.905.115.4612DE8.188.844.1315.017.495.22122Stoth8.188.844.1315.017.495.20122Stoth10.1116.7211.952312222 </td <td>ES</td> <td>5.01</td> <td>8.79</td> <td>25.17</td> <td>42.01</td> <td>19.77</td> <td>6.79</td> <td>5.16</td> <td>2</td> <td>38.36</td>	ES	5.01	8.79	25.17	42.01	19.77	6.79	5.16	2	38.36
HU 6.06 18.62 11.28 16.35 15.64 13.93 6.03 2 27.39 IT 3.57 14.72 8.64 29.63 27.65 5.83 10.36 2 36.12 PL 7.48 18.21 10.00 9.35 27.65 5.83 10.36 2 36.12 PL 7.48 18.21 10.00 9.35 20.13 12.37 7.05 2 29.43 CH 2.40 18.21 10.00 9.35 12.49 54.55 8.28 29.43 29.43 CH 2.40 11.82 3.52 11.81 17.03 11.10 4.35 10.10 28.30 CZ 6.64 13.79 14.32 8.29 22.40 8.13 7.96 1 28.30 DE 8.14 10.40 21.18 14.13 35.90 5.11 5.46 1 4.77 UT 8.65 8.84 4.13 15.01 7.49 5.22 1 20.67 SK 4.55 8.18 8.84 4.13 15.01 7.49 5.22 1 20.67 SK 4.55 8.18 8.84 4.13 15.01 7.49 5.22 1 20.67 SK 4.55 8.18 8.84 4.13 15.01 7.49 5.22 1 26.67 SK 4.55 8.18 8.84 4.13 15.01 7.49 5.20 1 10.72 SK	FI	9.61	13.59	10.81	13.9	38.72	11.37	7.00	2	20.02
IT 3.57 14.72 8.64 29.63 27.65 5.83 10.36 2 36.12 PL 7.48 18.21 10.00 9.35 20.13 12.37 7.05 2 29.43 SI 9.18 8.10 18.39 12.49 54.55 6.55 8.28 29.43 CH 2.40 18.39 12.49 54.55 6.55 8.28 22.40 23.60 CH 2.40 11.81 17.03 11.10 4.35 12 20.10 CZ 6.64 13.79 14.32 8.29 22.40 8.13 7.96 1 DE 8.14 10.40 21.18 14.13 35.90 5.11 5.46 1 40.77 UT 8.65 8.89 15.53 7.81 15.01 7.49 5.22 1 40.77 UT 8.68 8.84 4.13 15.01 7.49 5.22 1 20.667 SK 4.55 8.84 4.13 15.01 7.49 5.22 1 26.67 It 10.11 16.72 11.95 21.56 36.75 10.20 9.26 31.32	HU	6.06	18.62	11.28	16.35	15.64	13.93	6.03	2	27.39
PL 7.48 18.21 10.00 9.35 20.13 12.37 7.05 2 2 43 SI 9.18 8.10 18.39 12.49 54.55 6.55 8.28 2 30.10 CH 2.40 18.39 12.49 54.55 6.55 8.28 2 30.10 CT 2.40 11.82 3.52 11.81 17.03 11.10 4.35 1 28.30 DE 8.14 13.79 14.32 8.29 22.40 8.13 7.96 1 28.30 DE 8.14 10.40 21.18 14.13 35.90 5.11 5.46 1 40.77 UT 8.65 8.89 15.53 7.81 15.01 7.49 5.22 1 40.77 SK 4.55 8.18 8.84 4.13 15.01 7.49 5.22 1 40.77 Stotd 10.11 16.72 1.1.95 5.46 1	IT	3.57	14.72	8.64	29.63	27.65	5.83	10.36	2	36.12
SI 9.18 8.10 18.39 12.49 54.55 6.55 8.28 2.28 3.010 CH 2.40 11.82 3.52 11.81 17.03 11.10 4.35 1 28.30 CZ 6.64 13.79 14.32 8.29 22.40 8.13 7.96 1 28.30 DE 8.14 10.40 21.18 14.13 35.90 5.11 5.46 1 2 DF 8.89 15.53 7.81 15.01 7.49 5.22 1 40.77 SK 4.55 8.18 8.84 4.13 13.14 6.15 3.70 0 26.67 Total 10.11 16.72 11.95 21.56 36.75 10.20 926 31.32	PL	7.48	18.21	10.00	9.35	20.13	12.37	7.05	2	29.43
CH 2.40 11.82 3.52 11.81 17.03 11.10 4.35 1 28.30 CZ 6.64 13.79 14.32 8.29 22.40 8.13 7.96 1 28.34 DE 8.14 10.40 21.18 14.13 35.90 5.11 5.46 1 2 DF 8.65 8.89 15.53 7.81 15.01 7.49 5.22 1 42.08 DF 8.18 8.84 4.13 13.14 6.15 3.70 0 0 26.67 Total 10.11 16.72 11.95 21.56 36.75 10.20 926 3 31.32	SI	9.18	8.10	18.39	12.49	54.55	6.55	8.28	2	30.10
CZ 6.64 13.79 14.32 8.29 22.40 8.13 7.96 1 35.41 DE 8.14 10.40 21.18 14.13 35.90 5.11 5.46 1 40.77 LT 8.65 8.89 15.53 7.81 15.01 7.49 5.22 1 42.08 SK 4.55 8.18 8.84 4.13 13.14 6.15 3.70 0 26.67 Total 10.11 16.72 11.95 21.56 36.75 10.20 9.26 31.32	CH	2.40	11.82	3.52	11.81	17.03	11.10	4.35	1	28.30
DE 8.14 10.40 21.18 14.13 35.90 5.11 5.46 1 40.77 LT 8.65 8.89 15.53 7.81 15.01 7.49 5.22 1 42.08 SK 4.55 8.18 8.84 4.13 13.14 6.15 3.70 0 26.67 Total 10.11 16.72 11.95 21.56 36.75 10.20 9.26 31.32	CZ	6.64	13.79	14.32	8.29	22.40	8.13	7.96	1	35.41
LT 8.65 8.89 15.53 7.81 15.01 7.49 5.22 1 42.08 SK 4.55 8.18 8.84 4.13 13.14 6.15 3.70 0 26.67 Iotal 10.11 16.72 11.95 21.56 36.75 10.20 9.26 3.1.32	DE	8.14	10.40	21.18	14.13	35.90	5.11	5.46	1	40.77
SK 4.55 8.18 8.84 4.13 13.14 6.15 3.70 0 26.67 Total 10.11 16.72 11.95 21.56 36.75 10.20 9.26 3 31.32	LT	8.65	8.89	15.53	7.81	15.01	7.49	5.22	1	42.08
Total 10.11 16.72 11.95 21.56 36.75 10.20 9.26 3 31.32	SK	4.55	8.18	8.84	4.13	13.14	6.15	3.70	0	26.67
	Total	10.11	16.72	11.95	21.56	36.75	10.20	9.26	ŝ	31.32

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average

sums up in how many of the seven considered characteristics a country scores above average. Countries are sorted by this number of risks. For example Belgian lone mothers show in six out of seven characteristics comparatively high proportions: They are distinctively more often either inactive or unemployed, low educated, never married and live with numerous and/or young children. On the contrary, in Slovakia lone mothers on average tend to be older, employed, well educated, divorced and live with only few and older children. Accordingly, we would expect that countries with a high proportion of 'risky' characteristics among lone mothers also show higher at-risk-of-poverty rates. This holds true for some of the sample countries like Belgium, Luxembourg, Ireland and the UK. Inversely, in Finland, Hungary, Poland, Slovakia and Switzerland comparatively low proportions of risky characteristics are also associated with comparatively low at-risk-of-poverty rates for lone mothers.

However, for more than half of the sample the pattern is either not that clear or even in reverse: In Germany and the Czech Republic for example lone mothers are strongly at risk of poverty although their social composition is rather favorable. Except for the comparatively high unemployment rates for lone mothers, which might drive the high poverty risks. In contrast, Iceland and Norway, among those countries with the lowest at-risk-of-poverty rates for lone mothers, show a rather negatively selected social composition: One fourth and one third of all lone mothers is low educated. Similarly, the share of never married lone mothers ranks among the highest. Moreover, in Iceland and Norway young and inactive lone mothers with numerous (Iceland) and young children are more common than in other European countries. Even Danish lone mothers who face by far the lowest poverty risks show average rates of inactivity and unemployment and rather high shares of low education and out-of-wedlock births. Hence, social composition might account for some variation in lone mothers' poverty risks, but the same individual characteristics seem to translate into poverty risks only in some countries. This can be counted as an indicator for the importance of institutional configurations which shape individual risks and opportunities.

Institutional Configurations

This chapter stresses the role of gender inequalities in the labor market and the welfare state for lone mothers' poverty risks. Figure 8.1a–f provides some insights into the countries' institutional configurations in form of bivariate correlations. In order to relate these configurations to lone mothers' poverty risks country markers indicate whether a country's AROP rate for lone mothers lies above (filled) or below (hollow) the average. Figure 8.1a presents the positive and moderate correlation between the Female Labor Force Participation Rate and the Gender Pay Gap. Thus, in countries where most women work, they also tend to face comparatively higher pay disadvantages. The countries with the lowest at-risk-of-poverty rates for lone mothers also have comparatively high female labor force participation rates, but



Fig. 8.1 Correlations of gender inequalities indicators (Note: Filled marker symbols indicate lone mothers' AROP Rate **above average** (e.g. DE) and *hollow* markers *below* average (e.g. NL); N = 25)

rather show a medium degree of Gender Pay Gap. In some Eastern European countries (HU, PL; SI, SK) lone mothers face comparatively low poverty risks, although only around 50% of the women in these countries are integrated into the labor market. Figure 8.1b reveals that most of those women who actually are in the labor market work full time which might be a reason for the low at-risk-of-poverty rates in those respective countries. In general, lone mothers are the least affected by

poverty in countries where broad access to paid labor for women is combined with good opportunities for working full time. In contrast, in countries where a high female labor force is combined with low full time employment rates lone mothers' poverty risks tend to be comparatively high (i.e. DE, SE, UK). Similarly, a high female full time rate which is restricted to only a small share of the female population is associated with high at-risk-of-poverty rates for lone mothers.

Female employment is generally supported by the provision of formal childcare which helps mothers to reconcile paid work and care work. Surprisingly, female full time employment is negatively correlated with child care usage (Fig. 8.1c). In most countries where at least one third of the parents of very young children use formal childcare, full time employment rates for women lie below the average (except for ES, PT, SI). This negative association is mainly driven by East European countries where female full time employment is extremely high and childcare usage for children below the age of three is very low. This can be partly attributed to comparatively long parental leave durations in those countries so that most mothers would care at home for their young children until they enter kinder garden. Additionally, in some Eastern European countries public childcare has a bad reputation which encourages mothers even more to make full use of the parental leave entitlement (Heinen and Wator 2006: 205 for Poland, Saxonberg and Szelewa 2007: 359 for the Czech Republic and Poland). This negative correlation of female full time employment and childcare usage is also driven by the reversed case of the Netherlands: Although childcare usage is comparatively high, only few women work full time. This is not surprising as the short opening hours of most Dutch day care centers only enable part time work. As a consequence, the impact of childcare for lone mothers' poverty risks is not straightforward: In some countries (like Scandinavia) it enables lone mothers with young children to reconcile care and full time work which then prevents poverty.

However, in other countries (e.g. UK) childcare is rather market-based and therefore expensive which might eventually enhance poverty risks. Accordingly, in countries where motherhood is rewarded quite generously, female full time employment tends to be rather low (Fig. 8.1d). The cases of Luxembourg, Germany and Ireland illustrate well that even very generous family benefits do not seem to help lone mothers much to avoid poverty. Moreover, there is no strong correlation between the generosity of family benefits and the provision of formal childcare. While some countries clearly emphasize either family benefits (AT, CH, DE, IE) or formal childcare (ES, NL, PT, SE), most of the countries provide a mix of both (Fig. 8.1e). Furthermore, Fig. 8.1f shows the association of the provision of childcare and the organization principle of welfare states. Welfare states that rely to a great extent on social contributions often do not promote mothers' employment through public childcare. This is especially the case in many Eastern European countries. In Denmark, Iceland, Norway and Portugal the combination of a low share of social contributions and high formal childcare provision comes along with low poverty risks for lone mothers.

Summing-up the descriptive results so far: Lone mothers seem to face comparatively low poverty risks in countries where formal childcare is largely provided in combination with a more universal welfare state. Formal childcare provision enables lone mothers to reconcile care and labor. Therefore, it is important that lone mothers get broad access to the labor market and long hours. However, these patterns should only be seen as tendencies and there are always exceptions. Hence, the following multivariate analyses will shed some more profound light on the associations of structural gender inequalities and lone mothers' poverty risks.

Main Findings from Multi-level Analysis

Do Gender Inequalities Influence Lone Mothers' Poverty Risks?

Table 8.4 presents the results from different Random Intercept Models on lone mothers' poverty. The Random Intercept Only Model shows that the average probability of being poor even for a 41 year old full time employed, highly educated and divorced lone mother living with only 1 child older than two lies at 30%. Then, individual characteristics are included in the model (column 2). All coefficients point into the expected direction. The effects of marital status, number and age of children are quite small, though statistically significant. The individual effects remain robust when introducing country-level indicator of gender inequalities. The third model shows the coefficients of the three labor market indicators (Female Labor Participation, Female Full time Employment and Gender Pay Gap): They are all very small and only that of female full time employment is statistically significant. However, the reduction in the ICC indicates that some of the variance on the country level is captured by these variables. The Female Full Time Employment Rate (FFTER) seems to render a positive - thus enhancing - effect on lone mothers' poverty risks: When the FFTER increases by 1 standard deviation, then lone mothers' poverty risks increase by 4%. This rather unintuitive result will be analyzed in further detail in the next subsection. Next, a model with the three welfare state indicators is specified. While the two work-family policy indicators (childcare usage and family benefit generosity) are close to zero and insignificant, an increasing share of social contributions seems to aggravate lone mothers' poverty risks. The final model combines the two most relevant context indicators from the previous models. Both coefficients for female full time employment and share of social contributions decrease slightly, but show a robust poverty-enhancing effect for lone mothers. Deriving from this model there is no clear empirical evidence for hypothesis 1a, but there is some for 1b regarding the organization principle of welfare states.

	Intercept		Labor market	Welfare	
	only	Individual	(LM)	state (WS)	LM and WS
Fixed effects					
Age(centered)		001	001	001	001
Part time employed		.14***	.14***	.14***	.14***
ref. full time Emp.					
Unemployed		.43***	.43***	.43***	.43***
Inactive		.35***	.35***	.35***	.35***
Low educated ref.		.23***	.23***	.23***	.23***
high educated					
Medium educated		.11***	.11***	.11***	.11***
Never married ref.		.012	.013	.013+	.013+
divorced					
Widowed		080***	080***	080***	081***
2 children ref. 1 child		.063***	.063***	.063***	.063***
3 or more children		.13***	.13***	.13***	.13***
Child <3 years in HH		.016	.016	.017	.017
At-risk-of-poverty			.001	.039***	.018
rate					
Female fulltime			.044**		.037**
employment rate					
Female labor force			008		
part. Rate					
Gender pay gap			.006		
Child care				004	
Social contributions				.053**	.045***
Family benefits				.019	
Intercept	.301***	.034*	.034**	.034*	.034*
Random effects					
Intercept	.007***	.008***	.005***	.004***	.003***
ICC	.031	.046	.030	.023	.020
BIC	36279.0	29385.8	29416.1	29409.8	29395.3
Deviance	36248.2	29242.2	29231.5	29225.2	2922.8
LR-test		7006***	1.7*	17.0***	21.4***
$R^{2 Maddala}$.2185	.2188	.2189	.2191
N	28,420	28,420	28,420	28,420	28,420

Table 8.4 Estimates from multi-level linear probability models with random intercepts

Notes: Raw coefficients on individual level; age centered. Z-standardized coefficients at country level

+ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001

Do Gender Inequalities Affect the Effects of Individual Characteristics on Poverty?

The so far specified models treated all individual characteristics as identical across the 25 countries (fixed effects). However, I argued that these effects might rather vary across countries in the case of employment and presence of young children. And indeed, separate regression models for each country show a clear variation in effect size for full time and part time employment and to a smaller degree for very young children in the household (Figs. 8.A1 and 8.A2 in the Appendix). In order to address and exploit this variation two Random Slope models for each of the two variables are specified. These models allow the coefficient of full time employment (and respectively the presence of a child below the age of three) to vary across countries. Cross-level interactions then prove whether or not (some of) this variation can be 'explained' by gender inequality indicators. Accordingly, Table 8.5 contains 2 models per random coefficient, one with the individual characteristics and the main context indicator and another adding the respective cross-level interaction. The first column presents the Random Coefficient Model for full time employment with individual characteristics and the Female Full Time Employment Rate. As expected adding a random coefficient increases on the one hand the random intercept and on the other hand the Intra-class correlation⁵ (in comparison to the corresponding Random Intercept Model; Table 8.4, column 2). The Random Coefficient can be interpreted as the variance of full time employment across countries. This variance lies at .005 which appears rather small. This value corresponds to a standard deviation of .007. This means that in 95% of the cases the effect of full time employment varies between -.59 and -.31.

The next model (column 2) proves whether this variation might be a consequence of a differing FFTER across countries. And indeed, the coefficient for the crosslevel interaction of FFTER and lone mothers' full time employment is statistically significant and negative, although the overall model fit is not significantly improved. In countries with a high FFTER the poverty-reducing effect of full time employment compared to other employment categories is stronger than in countries with a low FFTER. This result is illustrated in Fig. 8.2. It shows the predicted probabilities of being at risk of poverty for lone mothers when working full time in contrast to working part time, being unemployed or inactive at different levels of Female Full Time Employment on the country level. With increasing Female Full Time Employment this gap grows wider: Within a country with a high share of Female Full Time Employment (e.g. HU, SK) the poverty-reducing effect of being full time employed compared to all other employment categories is larger than in countries with a comparatively low share of Female Full Time Employment. This finding goes in line with *Hypothesis 2*. Moreover, the figure also indicates that the poverty-

⁵The so called ICC indicates in the RIO Model the amount of variance which can be explained on level 2. In subsequent models it serves as an indicator for how much of this variance remains after introducing level 2 indicators.

enhancing effect of higher FFTER remains robust: In countries where the FFTER is low, lone mothers' predicted probabilities of being at risk are lower than in countries with a high FFTER. This counterintuitive result becomes clearer when keeping Fig. 8.1b, c in mind. High FFTER countries are mainly Eastern European countries with either underdeveloped or low quality public childcare. Thus, it is particularly difficult for lone mothers to reconcile labor and care responsibilities. Furthermore, in most countries where full time employment among women is low, the overall female labor force participation is high, thus the majority of women work part time. A potential interpretation is that in countries where female employment is common women can have good career opportunities and have access to well-paid jobs. This results in comparatively lower predicted probabilities for being poor as a full time working lone mother. In contrast, in countries where most of the women in the labor force work full time, but the female labor force as a whole comprises only up to 50% of the working age women, lone mothers might find only poorly paid full time jobs which protect them less from being poor. Overall, being full time employed reduces lone mothers' predicted probabilities of being poor compared to other employment status.

Column 3 and 4 in Table 8.5 represent the corresponding Random Coefficient Models for living with a very young Child. The fixed coefficient is close to zero and statistically insignificant. But, it is worthwhile to have a look at the country-specific coefficients for living with a very young child. Admittedly, effect sizes are rather small in most countries, but in some countries the sign of the coefficient is positive and in others negative. This variation could result in a quasi-zero association when pooling all countries together. Therefore, it is interesting to allow this coefficient to vary across countries. The variance lies at .10 which means that the fixed coefficients vary between -.21 and +.21. However, the Cross-level interaction model shows no empirical support for *Hypothesis 3*, as the interaction term is not statistically significant and does not show the expected negative sign. Further, both the BIC and the Likelihood-Ratio Test indicate a decline in model fit when adding the cross-level interaction.

Conclusion

This chapter aimed to shed some light on the variation in lone mothers' poverty risks across Europe. Descriptive in nature this chapter does not provide any causal inferences or dynamics of lone motherhood and poverty. Instead the idea was rather to introduce the framework of gender inequalities into the research of lone mothers' poverty risks and to model some of the main theoretical mechanisms of the institution-individual-nexus.

In order to analyze this phenomenon I compared lone mothers' poverty risks, individual characteristics and institutional configurations across 25 European countries. And the empirical analyses show that lone mothers' poverty risks follow specific mechanisms: Lone mothers' AROP rates do neither correspond to overall

	Full time	Full time cross	Young child	Young child cross
	random slope	level interaction	random slope	level interaction
Fixed effects				
Age(centered)	001	001	001	001
Full time employed ref. unemployed	415***	41***	430***	43***
Part time employed	280***	28***	290***	29***
Inactive	071***	070***	073***	073***
Low educated ref. high educated	.235***	.23***	.233****	.23***
Medium educated	.120***	.12***	.115***	.11***
Never married ref. divorced	.013+	.013+	.012	.012
Widowed	082***	083***	082***	082***
2 children ref. 1 child	.063***	.063***	.064***	.064***
3 or more children	.130***	.13***	.135***	.14***
Child <3 years	.015	.015	.028	.028
At-risk-of-poverty rate	.021	.021	.015	.015
Female fulltime rate (FFTER)	.030*	.053***		
FFTER*full time		023**		
Childcare usage rate			035*	041**
Childcare usage rate*child <3 years				.043+
Intercept	.456***	.456***	.460***	.459***
Random effects				
Intercept	.009***	.009***	.006***	.006***
Full time employed	.005**	.005**		
Child <3 years			.010	.009
ICC	.054	.052	.035	.034
Deviance	29116.4	29114.2	29234.1	29152.7
LR-test	115.3***	2.2	78.1***	3.3
BIC	29301.02	29309.1	2934.6	29347.5
$R^{2 Maddala}$.2218	.2220	.2208	.2209
N	28,420	28,420	28,420	28,420

 Table 8.5
 Estimates from multi-level linear probability models with random slopes and cross-level interactions

Notes: Raw coefficients on individual level; age centered. Z-standardized coefficients at country level

+ $p < 0.10, \, ^*p < 0.05, \, ^{**}p < 0.01, \, ^{***}p < 0.00$



Fig. 8.2 Predicted probabilities of being at risk of poverty for lone mothers by employment status at varying degrees of female full time employment rates (Note: Confidence intervals are displayed at the 95%-level)

at-risk-of-poverty rates nor to at-risk-of-poverty rates for partnered mothers. Descriptive analyses could also show no clear evidence for composition effects explaining the striking variation in lone mothers' poverty risks. Therefore, the focus was laid on the role of gender inequalities in the labor market and the welfare states for lone mothers' poverty risks. Overall, existing gender inequalities appear to account partly for s the variation in lone mothers' poverty risks across countries (Hypothesis 1(a) and b). Furthermore, this chapter contributes to the existing literature on lone mothers' poverty risks as it explicitly models the interplay of institutional factors and individual characteristics. And indeed, there is some empirical evidence that the poverty-reducing effect of full time employment is not identical across countries, but rather dependent on the respective employment regimes. Including Eastern European countries into the analyses also challenges the broadly acknowledged positive linear association of childcare provision and female full time employment and how both indicators relate to lone mothers' poverty risks. A high FFTER does not necessarily correspond with low poverty risks for lone mothers like in Estonia, Latvia or the Czech Republic. Either lone mothers don't get access to those jobs as they cannot find good and feasible childcare or they often end up in low paid full time jobs which cannot prevent them from being at risk.

Though, this chapter finds no clear interaction effect of childcare provision and the poverty-enhancing effect of young children in the household. In part this might be due to measurement problems as the childcare indicator includes both public and market provided childcare which might shape lone mothers' employment opportunities in very different ways. Nevertheless, in general the empirical analyses show a negative impact of existing gender inequalities on lone mothers' lives increasing their risk of poverty. As a consequence, policies which strengthen gender equality in the labor market and the welfare state would not only help to reduce the gender gap, but particularly to improve the living conditions of lone mothers and their children. This broad cross-sectional analysis wants to be understood as a starting point for future longitudinal research with fewer country cases and a more in-depth institutional analysis.

Acknowledgements This paper benefited from the support of the Swiss National Centre of Competence in Research LIVES – Overcoming Vulnerability: Life Course Perspectives, which is financed by the Swiss National Science Foundation (Grant number: 51NF40-160590).

Appendix



Fig. 8.A1 Coefficients for full time and part time employment on lone mothers' poverty risks from single country regressions (Linear probability models) (Note: CIs displayed at the 95% level)



Fig. 8.A2 Coefficients for children up to 3 years and up to 6 years on lone mothers' poverty risks from single country regressions (Linear probability models) (Note: CIs displayed at the 95% level)

References

- Aisenbrey, S., Evertsson, M., & Grunow, D. (2009). Is there a career penalty for mothers' time out? A comparison of Germany, Sweden and the United States. *Social Forces*, 88(2), 573–606.
- Andreß, H.-J., Borgloh, B. B., Bröckel, M., Giesselmann, M., & Hummelsheim, D. (2006). The economic consequences of partnership dissolution – A comparative analysis of panel studies from Belgium, Germany, great Britain, Italy, and Sweden. *European Sociological Review*, 22(5), 533–560.
- Bahle, T., Göbel, C. G., & Hubl, V. (2013). Familiäre Risikogruppen im europäischen Vergleich. WSI Mitteilungen. Zeitschrift des Wirtschafts- und Sozialwissenschaftlichen Instituts der Hans-Böckler-Stiftung, 66(3), 192–200.
- Bardasi, E., & Gornick, J. C. (2008). Working for less? Women's part-time wage penalties across countries. *Feminist Economics*, 14(1), 37–72.
- Benard, S., & Correll, S. (2010). Normative discrimination and the motherhood penalty. *Gender & Society*, 24(5), 616–646.
- Brady, D., & Burroway, R. (2012). Targeting, universalism and single mother poverty: A multilevel analysis across 18 affluent democracies. *Demography*, 49, 719–746.
- Brady, D., Fullerton, A. S., & Cross, J. M. (2009). Putting poverty in political context: A multilevel analysis of adult poverty across 18 affluent democracies. *Social Forces*, 88(1), 271–299.
- Brooks-Gunn, J., Han, W.-J., & Waldfogel, J. (2002). Maternal employment and child cognitive outcomes in the first three years of life: The NICHD study of early child care. *Child Development*, 73(4), 1052–1072.

Christopher, K. (2002). Welfare state regimes and mothers' poverty. *Social Politics*, *9*(1), 60–86. Esping-Andersen, G. (1990). *The three worlds of welfare capitalism*. Oxford: Polity Press.

- European Commission. (2007). The social situation in the European Union 2005–2006. The bal-
- ance between generations in an ageing Europe. Luxembourg: Office for Official Publications of the European Communities.
- Eurostat. (2009). Description of SILC user database variables: Cross-sectional and longitudinal. Version 2007.1. Retrieved September 21, 2017, from http://www.forschungsdatenzentrum.de/ bestand/eu-silc/fdz_eu-silc_eurostat_engl_nutzerdatensatz_2007-01.pdf.
- Eurostat. (2014). Eurostat newsrelease. Retrieved from http://ec.europa.eu/eurostat/ documents/2995521/6035076/3-04112014-BPEN.pdf/62f94e70-e43a-471f-a466-2e84d1029860.
- Fux, B. (2011). Sozioökonomische Situation und soziale Beziehungen von Alleinerziehenden. Ergon Verlag: Würzburg.
- Gangl, M., & Ziefle, A. (2009). Motherhood, labor force behavior and women's careers: An empirical assessment of the wage penalty for motherhood in Britain, Germany and the United States. *Demography*, 46(2), 341–369.
- Grunow, D., Aisenbrey, S., & Evertsson, M. (2011). Familienpolitik, Bildung und Berufskarrieren von Müttern in Deutschland, USA und Schweden. Kölner Zeitschrift für Soziologie und Sozialpsychologie, 63, 395–430.
- Heckman, J. (1979). Sample selection bias as a specification error. *Econometrica*, 47(1), 153–161.
- Heimer, A., Knittel, T. & Steifle, H. (2009). Vereinbarkeit von Familie und Beruf für Alleinerziehende. Research dossier on behalf of the Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (BMFSFJ). Basel/Berlin.
- Heinen, J., & Wator, M. (2006). Child care in Poland before, during, and after the transition: Still a women's business. Social Politics: International Studies in Gender, State and Society, 13(2), 189–216.
- Hobson, B. (1994). Solo mothers, social policy regimes, and the logics of gender. In D. Sainsbury (Ed.), *Gendering welfare states* (pp. 170–187). London: SAGE Publications Ltd.
- Huber, E., Stephens, J. D., Moller, S., & Nielsen, F. (2009). The politics of women's economic independence. *Social Politics*, 16(1), 1–39.
- Jaehrling, K., Erlinghagen, M., Kalina, T., Mümken, S., Mesaros, L. & Schwarzkopf, M. (2011). Arbeitsmarktintegration und sozio-ökonomische Situation von Alleinerziehenden. Ein empirischer Vergleich: Deutschland, Frankreich, Schweden, Vereinigtes Königreich. Research report 420 on behalf of the Federal Ministry of Labour and Social Affairs (BMAS). Berlin.
- Kiernan, K., McLanahan, S., Holmes, J. & Wright, M. (2011). Frage Families in the US and UK (Working Paper 11–04-FF). Princeton University: Centre for Research on Child Well-Being.
- Kohler, U., Ehlert, M., Grell, B., Heisig, J. P., Radenacker, A., & Wörz, M. (2012). Verarmungsrisiken nach kritischen Lebensereignissen in Deutschland und den USA. Kölner Zeitschrift für Soziologie und Sozialpsychologie, 84(2), 223–245.
- Lelkes, O., & Zólyomi, E. (2008). *Poverty across Europe: The latest evidence using the EU-SILC survey*. Europe: European Centre for Social Welfare Policy and Research.
- Mandel, H., & Semyonov, M. (2006). A welfare state paradox: State interventions and women's employment opportunities in 22 countries. *American Journal of Sociology*, 111(6), 1910–1949.
- Misra, J., Moller, S., & Budig, M. (2007). Work-family policies and poverty for partnered and single women in Europe and North America. *Gender & Society*, 21(6), 804–827.
- Misra, J., Moller, S., Strader, E., & Wemlinger, E. (2012). Family policies, employment and poverty among partnered and single mothers. *Research in Social Stratification and Mobility*, 30, 113–128.
- Mood, C. (2010). Logistic regression: Why we cannot do what we think we can do and what we can do about it. *European Sociological Review*, *26*(1), 67–82.
- Orloff, A. S. (2009). Gendering the comparative analysis of welfare states: An unfinished agenda. Sociological Theory, 27(3), 317–343.
- Ott, N., Hancioglu, M. & Hartmann, B. (2011). Dynamik der Familienform "alleinerziehend". Research report 421 on behalf of the Federal Ministry of Labour and Social Affairs (BMAS). Berlin.

- Pfau-Effinger, B. (2004). Development of culture, welfare states and Women's employment in *Europe*. Aldershot: Ashgate.
- Pfau-Effinger, B. (2005). Welfare state policies and the development of care arrangements. *European Societies*, 7(2), 321–347.
- Radenacker, A. (2011). Economic consequences of family break-ups. Income before and after family break-ups of women in Germany and the United States. Schmollers Jahrbuch – Zeitschrift für Wirtschafts- und Sozialwissenschaften, 131(2), 225–234.
- Sainsbury, D. (Ed.). (1999). *Gender and welfare state regimes*. Oxford/New York: Oxford University Press.
- Sawhill, I. (2003). The behavioral aspects of poverty. The Public Interest, 153, 79-93.
- Sawhill, I. (2014). *Generation unbound. Drifting into sex and parenthood without marriage.* Washington, DC: Brookings Institution Press.
- Saxonberg, S., & Szelewa, D. (2007). The continuing legacy of the communist legacy? The development of family policies in Poland and the Czech Republic. *Social Politics: International Studies in Gender, State and Society*, 14(3), 351–379.
- Smeeding, T. (2005). Public policy, economic inequality, and poverty: The United States in comparative perspective. *Social Science Quarterly*, 86(s1), 955–983. https://doi. org/10.1111/j.0038-4941.2005.00331.x.
- Vandecasteele, L. (2011). Life course risks or cumulative disadvantage? The structuring effect of social stratification determinants and life course events on poverty transitions in Europe. *European Sociological Review*, 27(2), 246–263.
- Zagel, H. (2014). Are all single mothers the same? Evidence from British and West German women's employment trajectories. *European Sociological Review*, 30(1), 49–63.

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