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## **Female employment and parental leave: the case of Poland**

### **Abstract**

With the use of the Polish Social Security's administrative data for the period 1999–2011, nonparametric and Cox models, the author assesses the role of the means-tested child-raising allowance in shaping an effective period for parental leave and the impact of parental leave duration on the subsequent (continued) job tenure.

The results suggest low income level (an eligibility criterion for child-raising allowance) loses any significant negative effect on the intensity of returning to a job as soon as the eligibility period for the allowance expires. Long periods of parental leave increase the intensity of transition to unemployment soon after the return to the interrupted job but they have only a minor impact on the intensity of transition to other jobs. The intensity of transition from the continued job to unemployment is also related to employment in the private/public sector, unemployment history and length of service.

**Keywords:** parental leave duration, female employment duration, child-raising allowance impact, duration analysis, policy evaluation

**JEL:** J18, J48, K31

**Disclaimer:** the views and opinions expressed in this article are those of the author and do not necessarily reflect the official policy or position of any agency of the Polish government.

### **Introduction**

In the second decade of the XXI century there is a need to draw the policymakers' attention towards the family policy issues in Poland. Poland currently belongs to those countries with the lowest fertility rates in Europe and whilst, since 2004, a slight rebound

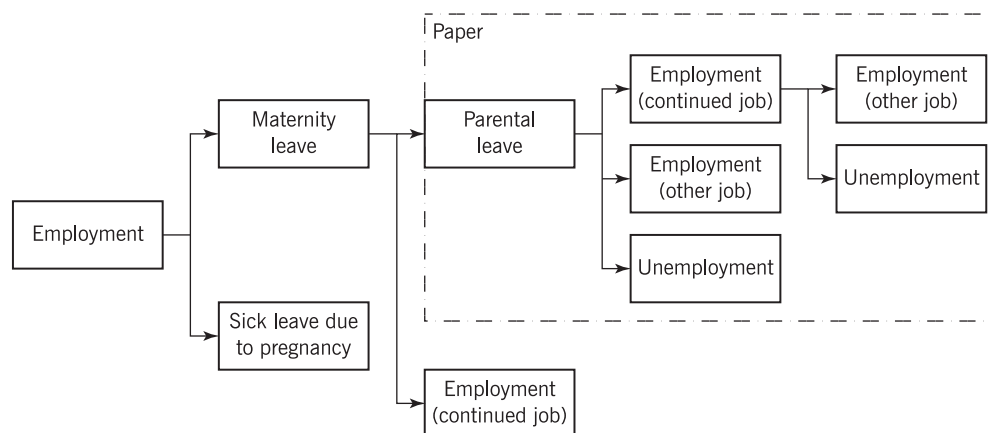
has been observed, TFR is very far from the levels registered three decades ago, posing the threat of a demographic disaster in 20 years. One of the reasons for this can be seen in the disruption of the balance between work/family that began during the transformation to the market economy. Low fertility in Poland suggests the family policy is insufficiently compatible with parenthood. It is worth noticing that for various work/family models (particularly for the dual-earner model that dominates in Poland) the state offers child tax credit on the one hand and very long (compared with other EU and OECD countries) parental leave along with the option of income splitting for purposes of filing a joint tax return for spouses (other family policies, including childcare arrangements, are of minor importance in Poland). As tax credit is often more useful for families where both parents are working (tax credit in Poland has no phase-out and it cannot exceed paid income tax) it should therefore encourage employment; long parental leave, however, seems to discourage one parent from working. Therefore, these instruments appear to be directed towards different families. The impact of parental leave policy on labor market participation and further unemployment seems to be unclear – too short period of parental leave may force a woman that decides to raise her child on her own to exit the labor market. On the other hand, extended parental leave may lead to human capital depreciation and it can seriously harm any subsequent employment career [OECD, 2011].

The aim of the following article is to assess the role of child-raising allowance on the duration of parental leave and the impact of the duration of parental leave on the job tenure after returning to the same employee. Both can be illustrated by duration analysis based on data from the Polish Social Security system. The paper begins with a theoretical framework description and research hypotheses (part 2). Part 3 describes the dataset and methods. Part 4 and 5 contain descriptive statistics for females who take parental leave and for women that returned to their interrupted jobs. Part 6 and 7 concerns the results from nonparametric and Cox hazards models of parental leave spell and continued job tenure after the parental leave. Part 8 contains conclusions.

## **Theoretical framework**

The theoretical framework of the research presented in this paper is related to several hypotheses on the relations between post-natal employment and voluntary parental leaves. It is expected that the shape of the regulations governing leave may influence the entire context of female employment and therefore influence the decisions on whether to have a child, leave the labor market in order to take personal care of the child, remain out of the labor market whilst on leave and re-enter the labor market. It also influences the employer's response to female staff decisions, including the dismissal of employees that take voluntary parental leave.

FIGURE 1. Maternity and parental leaves in the labor market



Note: States are bolded. Events are emphasized by italics. States and events in grey are beyond the scope of this analysis.

Source: own preparation.

Following OECD [2011], the length of parental leave can be determined by individual preferences, the duration of paid child-related leave schemes, formal and informal childcare, earnings of spouses and workplace support. In particular, even low and flat-rate parental leave payment rates reduces the incentives to work for low-income earners [OECD, 2011]. Therefore, they are most likely to make full use of prolonged leave arrangements, while well-paid women either take no parental leave or take relatively short periods of leave due to high opportunity costs and more possibilities for affording paid childcare [OECD, 2011]. Matysiak [2005] points out lower compensation boosts the return of female employees to the workplace but higher compensation might encourage male workers to take parental leave instead of their spouses. She also suggests that the flexibility of the leave schemes and transferability for the partner may lead to greater numbers of women in the labor market and shorter female career breaks.

The overall effect of paid leave on work interruptions is not clear *a priori*. A paid leave policy encourages some women to interrupt work on the one hand, but it also entices other women to return to the job after birth rather than quit, resulting in a shorter interruption of work [Joesch, 1997]. The impact of leave-taking on retaining the job after returning from a period of leave is presented by some scholars as positive, particularly in the case of short, unpaid but job-protected leave [Gauthier, 1996; Bussemaker and van Kersbergen, 1996; Berger and Waldfogel, 2004; Espinola-Arredondo and Mondal, 2009; Han et al., 2009; Baker and Milligan, 2008]. Returning to the same job after taking leave as a result of job-protection regulations gives the

possibility to retain firm-specific human capital among female employees [Pronzato, 2009]. Gupta, Smith and Verner [2008] argue that formal job protection improves post-natal employment by easing the return to work but this protective effect declines after an unspecified length of time [Verner, 2008]. However, there is more evidence that one ought to expect some negative effects from parental leave on female employability and wages, including a negative correlation between the statutory length of parental leave and the employment rate among mothers with young children [OECD, 2011]. Speedy return to actual work is seen as a prerequisite for maintaining employment [Klerman and Leibowitz, 1994]. According to their study, most women working when their child was one year old had returned to work within three months after childbirth. Long periods of parental leave may lead to human capital depreciation [Edin and Gustavsson, 2007]; especially among highly educated women [Baum, 2003; Gutiérrez-Domènech, 2005]. This can be rooted in the theory of human capital, with a hypothesis that education should be treated as investment that could result in higher wages in the future and the assumption wages reflect productivity [Becker, 1964]. The Human Capital Model with Training over the Life Cycle takes into account not only the prior education but also experience gained during employment. It also includes the rate of human capital depreciation. Measuring the actual rate of the human capital depreciation can be made with use of Mincer's earnings function, so that it can account for heterogeneous employment histories, including information on possible career interruptions [Mincer and Polachek, 1974 and 1978; Mincer and Ofek, 1982]. Basing on these models, prolonged parental leave should lead to human capital depreciation responding to depreciation rate. Because one assumes wages reflect productivity, drop in human capital translates to drop in wages, reducing wage growth and – due to inelasticity – dismissing an employee. Among other mechanisms, long periods spent on leave impair a women's attachment to the labor market, including any attachment to the employer that granted the leave [Jaumotte, 2003]. Every break in employment is inconvenient for the employer who has to find a replacement for the employee [Kotowska et al., 2007]. Furthermore, they have no guarantee the employee is willing to return to the same job [OECD, 2011] and may perceive the taking of leave as a signal of low commitment.

Therefore, parental leave may be followed by job termination after the return from the leave. Ejrnæs and Kunze [2006] found that extended parental leave in Germany could have a negative impact on female employment, though this was not confirmed by the research of Schönberg and Ludsteck [2008]. Numerous scholars have produced evidence that extended parental leave has a negative impact on subsequent earnings [Ruhm, 1998; Ondrich et al., 2002; Beblo and Wolf, 2002; Ejrnæs and Kunze, 2006; Zhang, 2007; Gupta, Smith and Verner, 2008]. There are some examples of catching-up compared with women without children, however [Gupta and Smith, 2002]. For first transition to employment after the first childbirth, a polarization is found between highly educated,



high-wage mothers and lower-educated, low-wage mothers [Dex et al., 1998]. Finally, parental leave is perceived as an instrument that may lead to gender discrimination [Pylkkänen and Smith, 2004].

The mandatory and voluntary leave in Poland has already been a research subject in a few dedicated publications [Wóycicka et al., 2006; Kotowska et al., 2007, Matysiak, 2012]. They provide an analysis of employment breaks related to motherhood and the returns of mothers to the labor market, basing on the Labor Force Survey module "Work/family reconciliation" (2005) and on another research "Professional, educational and family biographies" (2006). Matysiak presents in the report [Kotowska et al., 2007] the piecewise exponential model of job continuity after having a child. According to the model, the hazard of losing a job rises in the 4th and 12th month following childbirth and it is higher than that of women without children with similar observable characteristics. The rise from the 12<sup>th</sup> month is perceived by Matysiak as an impact of the parental leave – women that have taken the leave attempt a return to employment but move on soon after their job-protection expires. However, the design of the research limited it to women employed for 3 years until the moment of conception.

The paper is to test the hypothesis that the effect of transfers combined with parental leaves is significant enough to shape the effective length of parental leave and that the length of parental leave has a negative impact on the continuation of employment following such a leave. In comparison to [Kotowska et al., 2007], the author emphasizes the period of parental leave and job continuation after the leave, using administrative data instead of survey data. The author expects extended parental leave results in the increased risk of transition to unemployment due to declining human capital and possible retributive measures by the employer. Alternatively, the opposite is also possible, due to an additional year of job protection in case of transition to part-time employment after return from a leave. The author is to test whether extended parental leaves are related to more intensive transitions within the labour market when compared with shorter leaves and to verify whether the public sector can be perceived as a more stable employer for women taking parental leave, which can be inferred from the work of Pylkkänen and Smith [2004]. The paper tries to answer if the work experience allows job security for professional mothers leaving the labor market to take care of their children and to test the significance of the hysteresis effect of unemployment spells in the past on job continuation.

The article is a first step in the analysis of mothers' employment. Further research is planned to compare mothers on parental leave with mothers that have not taken the parental leave and females with no children. Penalized splines could be also used as in work of Kuhlenkasper and Kauermann [2010]. A general equilibrium approach to model the impacts of parental leaves (e.g. [Erosa et al., 2010]) would be the most powerful tool for modelling the impact of policy changes.

## Data and methods

To verify the aforementioned hypotheses there is a need for data that can be analyzed using the longitudinal approach; data that is precise, representative for the population and capable for revealing the causal effects. Until now, the research on the parental leave has been based on survey and retrospective data (see [Kotowska et al., 2007]). In the following paper, the non-identifiable sample of the Social Security system's administrative database has been used instead. Administrative data, collected on a monthly basis, contains the most accurate information available on the duration of spells of employment in Poland, appropriate for duration analysis. The sample has been created by a random selection of the full history for 1% of individuals that have been insured by the public scheme for at least one month in the period between January 1999 and August 2011 – in total 250,806 observed individuals. The dataset contains periods when each insured individual in the general insurance system paid social contributions, their corresponding income and – in the case of the employed – their NACE employer codes. The sample also contains information on gender, date of birth, place of birth of the insured individual and the employer's place of residence. Based on data available, the incidence of spells of unemployment in a period of two years before taking the parental leave and approximated length of service has been also calculated.

The dataset has been used to calculate spells of female parental leave, as well as employment (broken down by different employers), self-employment, unemployment, vocational training and maternity leave. Data has been transformed to illustrate the records of 14,956 spells of female parental leave<sup>1</sup>, followed by 4,579 records of continued employment with the previous employer. For both periods, the preceding and successive events are taken into consideration (if not censored).

The determinants of the spell of parental leave and job tenure, following parental leave, for the employer who granted the leave have been estimated using Cox models [Cox, 1972]. If necessary, time-varying variables have been added to the model. The hazard of this model is defined as follows:

$$h_i(t) = \lambda_0(t) \exp \left( \sum_{j=1}^k \beta_j X_{ij} + \sum_{j=k+1}^{k+l} \beta_j X_{ij}(t) \right)$$

where  $\lambda_0(t)$  is the baseline hazard function,  $x_{ij}$  is a set of individual characteristics – the first  $k$  variables are time-invariant and the remaining  $l$  are time-varying (denoted  $x_{ij}(t)$ ) and the coefficients to be estimated are denoted as  $\beta_j$ <sup>2</sup>.

Five semi-parametric models have been presented in this paper: three for the duration of parental leave and two for the duration of the job contract for women that returned to the same job after the taking of leave. Models 1–3 are estimated on 9,115<sup>3</sup>

spells for the following events: return to the same job (Model 1), immediate transition to another job (Model 2) and immediate transition to unemployment (Model 3). They use: length of service, earnings, employer branch and the unemployment record for the period of 2 years prior to the taking of leave as covariates. Models 4 and 5 are based on 3,565 spells finishing with transition to unemployment (Model 4) or by transition to another job or self-employment (Model 5). The determinants in model 4 and 5 are: the duration of parental leave, length of service, employer branch and unemployment record for the period of 2 years prior to the taking of leave. Models 1, 2, 3 as well as models 4 and 5 deal with the same individuals in the same state (though states for models 1, 2 and 3 are different than for models 4 and 5) and the occurrence of one type of event removes the individual from the risk of other events. Therefore, the competing risks approach has been used, with implicit orthogonality assumption for random arrival times associated with each risk.

## Duration of parental leave – descriptive statistics

Table 1 examines the distribution and mean duration of parental leave spells grouped by their terminating events. Descriptive statistics aim to verify whether there are systematic differences between female parental leave takers that finished the leave by transition to different states. Moreover, they are necessary to verify the existence of systematic biases caused, for example, by the relatively short observation window (years 1999–2011) that may lead to underestimation of the length of the parental leave.

The duration of parental leave differs in the reason for termination and the personal characteristics of the leave-taker. The difference between transition to another job or self-employment and transition to unemployment is significant (16.8 *versus* 19.9 months), particularly for older females, with longer working experience. The differences are smaller in case of return to the interrupted job and transition to unemployment (18.1 *versus* 19.9 months) and even smaller between return to the previous job and a new job or self-employment.

Length of service might play a positive role in securing the return to the same job – those who took parental leave and returned to the same employer are characterized by longer working experience. It also seems that higher wages work to discourage individuals from taking parental leave (and extended leave in particular). A drop in mean parental leave duration is particularly significant for the transition to another job what may suggest that the rate of voluntary job changes is relatively high. The rate of those employed in the public sector is smaller for transition to unemployment than to employment. On the other hand, parental leaves there taken are on average shorter than in the private sector.

TABLE 1. Distribution and mean duration of parental leave by reason for termination

		Parental leave spell			
		Exit state			
		1: The same job			
Variable	Label	N	PctN	Mean dur.	StdDev dur.
Length of service					
1	0-3 years	973	28.81	18.37	11.25
2	4-6 years	906	26.83	17.95	11.39
3	7-10 years	859	25.44	17.97	11.38
4	11+ years	639	18.92	18.18	12.27
Earnings					
1	< 0.7 avg wage	2 847	84.31	18.73	11.48
2	0.7 avg wage $\leq x < 1.2$ avg wage	390	11.55	15.73	11.19
3	$\geq 1.2$ avg wage	140	4.15	12.34	10.80
Employer branch					
1	agriculture, mining, manufacturing, energetics and construction	930	27.54	19.46	11.45
2	commerce, car reparation, transportation, gastronomy and hotels	1 159	34.32	19.67	11.37
3	communication, financial, real estate, scientific and administrative services	478	14.15	16.76	11.16
4	public administration, national defense, social security, education, health care, social aid, culture and entertainment	810	23.99	15.17	11.37
Unemployment history					
0	none in 2 years before leave	3 015	89.28	17.83	11.55
1	yes in 2 years before leave	362	10.72	20.51	10.99
Age					
1	16-25 years	677	20.05	19.76	11.00
2	26-30 years	1 460	43.23	17.84	11.52
3	31+ years	1 240	36.72	17.55	11.72
Total		3 377	100.00	18.12	11.52

S o u r c e: Own calculations based on Social Insurance database. Only completed spells included.

Parental leave spell				Parental leave spell			
Exit state				Exit state			
2: Other job or self-employment				3: Unemployment			
N	PctN	Mean dur.	StdDev dur.	N	PctN	Mean dur.	StdDev dur.
474	34.65	17.14	11.02	644	44.05	18.79	11.57
380	27.78	16.91	11.53	387	26.47	19.70	12.03
313	22.88	16.22	11.91	258	17.65	20.47	13.01
201	14.69	16.76	12.93	173	11.83	23.32	13.34
1 139	83.26	17.94	11.46	1389	95.01	20.07	12.19
160	11.70	11.15	10.95	63	4.31	16.22	12.74
69	5.04	11.26	11.25	10	0.68	14.10	13.05
313	22.88	18.17	12.07	454	31.05	20.44	12.77
504	36.84	19.00	11.16	741	50.68	20.50	11.85
266	19.44	15.28	11.30	166	11.35	18.45	11.88
285	20.83	12.87	11.22	101	6.91	14.93	12.12
1 223	89.40	16.74	11.71	1042	71.27	20.00	12.79
145	10.60	17.41	11.19	420	28.73	19.52	10.77
297	21.71	19.20	11.55	456	31.19	19.57	11.44
621	45.39	16.11	10.97	632	43.23	19.11	12.38
450	32.89	16.19	12.44	374	25.58	21.51	12.82
1 368	100.00	16.81	11.66	1462	100.00	19.86	12.24

## **Duration of employment after parental leave – descriptive statistics**

Table 2 examines the distribution and mean duration of jobs continued after the taking of parental leave, and gives reasons for termination.

Mean job tenure of mothers that returned after the leave to their previous employment was 7.6 months for those who became unemployed and 13.8 months for those who changed their job. Employment spells terminated by a change in jobs are, on average, longer than those terminated by unemployment for each category illustrating the duration of parental leave; this difference is striking for short-term leave and it almost vanishes for longer leave (2 years and above). This might suggest that the duration of parental leave significantly facilitates the transition to another job (voluntary or involuntary). 57% of transitions to unemployment and 38% job switches concern female workers that spent not less than 2 years on leave, suggesting a detrimental impact of long leaves. It seems to be coherent with the work of Harris [1996] that examined American single mothers in employment with spells of claiming welfare. Employment periods for these women were on average shorter and return to welfare faster if their welfare spell that preceded employment had been relatively long.

Taking working experience into account, its length might have a negative impact on the transition to unemployment or another job, what goes in line with results of Böheim and Taylor [2002]. Furthermore, females with unemployment history are characterized by shorter mean job tenure and larger propensity of the transition to unemployment comparing with females without unemployment record. Only 6% of observations that moved to a state of unemployment were females employed in public administration, national defense, social security, education, health care, social aid, culture and entertainment, suggesting public sector jobs are more secure for women taking personal care of their children.

TABLE 2. Distribution and mean duration of job tenure (months) by reason for termination

		Job continuation							
		Exit state							
		1. Unemployment				2. Other job or self-employment			
		N	PctN	Mean duration	StdDev duration	N	PctN	Mean duration	StdDev duration
Leave duration									
1	< 6 months	55	7.86	8.16	16.64	170	16.49	23.51	28.53
2	6 months ≤ x < 24 months	247	35.29	8.40	13.95	472	45.78	14.47	23.43
3	≥ 24 months	398	56.86	7.05	12.95	389	37.73	8.82	16.28
Length of service									
1	0-3 years	282	40.29	5.24	10.82	237	22.99	10.23	15.49
2	4-6 years	177	25.29	6.15	10.16	294	28.52	10.68	19.03
3	7-10 years	133	19.00	8.98	15.13	269	26.09	15.28	23.66
4	11+ years	108	15.43	14.53	19.60	231	22.41	19.85	29.27
Employer branch									
1	agriculture, mining, manufacturing, energetics and construction commerce, car reparation, transportation, gastronomy and hotels	576	82.29	7.79	13.92	482	46.75	12.71	19.32
2	communication, financial, real estate, scientific and administrative services	79	11.29	5.63	10.47	180	17.46	12.12	19.05
3	public administration, national defense, social security, education, health care, social aid, culture and entertainment	45	6.43	8.82	14.56	369	35.79	16.13	27.45
Unemployment history									
0	none in 2 years before leave	549	78.43	8.74	14.69	948	91.95	14.16	22.77
1	yes in 2 years before leave	151	21.57	3.51	7.44	83	8.05	10.02	19.97
Age									
1	16-25 years	115	16.43	2.90	5.77	96	9.31	9.3	14.08
2	26-30 years	268	38.29	6.97	12.52	400	38.8	12.44	20.54
3	31+ years	317	45.29	9.87	15.89	535	51.89	15.68	24.97
Total		700	100.00	7.61	13.62	1031	100.00	13.83	22.57

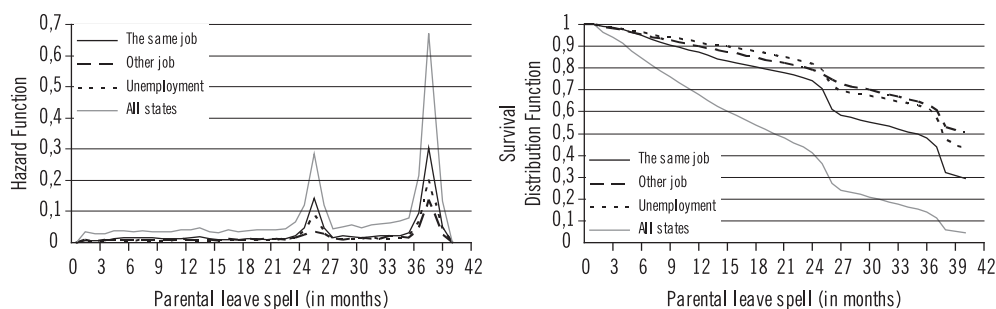
Source: Own calculations based on Social Insurance database. Only completed spells included.

## Duration of the parental leave – estimation results

### Life tables

Figure 2 shows the life table hazard and survival function estimates of the spells of parental leave by type of exit. Parental leaves are most frequently terminated by a transition to the interrupted job. Hypothetically, provided that no other reason for termination occurs, 30% of leave-takers would survive 40 months without a transition to the same job, compared with 50% for another job and 43% for unemployment. The author implicitly presumes transition to employment earlier than 36 months is voluntary while any transition to unemployment is involuntary. Such an assumption justifies using a competing risks approach that requires the random arrival times associated with each risk to be orthogonal. Going further, to reveal the real intended length of a spell of parental leave, more attention should be paid to the transition to employment rather than to unemployment.

FIGURE 2. Life Table hazard and survival estimates of parental leave spell



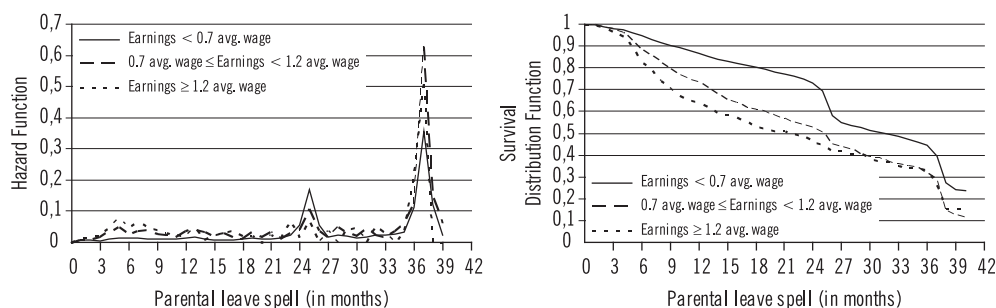
Source: own preparations based on Social Insurance database.

Among the hypotheses to be tested, a crucial role is played by that which shows the expected impact of child-raising allowance on the duration of parental leave. Figure 3 presents the life table hazard and survival function estimates by income level on those spells of parental leave terminated by a return to the previous job.

There are two peaks in the hazard function – the first slightly after 24 months and another one after 36 months from the beginning of the spell of parental leave. Note that the first peak is not observable for well-paid female employees that do not meet the eligibility criterion for the child-raising allowance. Moreover, the peak after the 24<sup>th</sup> month is present for all classes of every other labor market characteristic that are used for modelling, i.e. unemployment record, employer branch, years of service (though the peak is quite small for some of them). Therefore, the author assumes the first peak in the



**FIGURE 3. Life Table hazard and survival estimates of parental leave spells terminated by return to the same employer – the effect of earnings (eligibility criterion)**



Source: own preparations based on Social Insurance database.

hazard rate can be adequately explained by cancelling the child-raising allowance. The second peak responds to the maximal spell for the majority of cases (except when taking care of disabled children or when using overlapping parental leaves for another child). Except for the two aforementioned peaks, the hazards are relatively small (though higher for well-paid female workers) and time-invariant.

The comparison of the hazard rates for low and high-earners suggests the assumed hazards proportionality for the Cox model is not to be satisfied for the entire leave period, yet it appears to be satisfied considering separately period before and after the allowance has been granted.

Corresponding SDF shows the differences between low and high-earners. One can observe a significant drop in surviving leave-takers with earnings below 0.7 average wages from about 74% to 55% between the 24 and 27<sup>th</sup> month and only a minor drop from 46% to 42% for female individuals with earnings above 1.2 of the average wage within the same period.

Similar analysis conducted for the transition to other employment shows a lower intensity of transition for lower wages but no peak after the first two years of the parental leave.

### Cox models

The estimation results of the proportional hazards model are presented in Table 3. Three models of parental leaves have been estimated, the first for the event defined as leave termination followed by a return to the same job, the second for leave termination due to transition to another job and the final one for transition to unemployment.

The results for model 1 and 2 confirm that child-raising allowance increases the effective duration of parental leave for female individuals entitled to it. Women with higher earnings have a higher intensity of termination due to the transition to the same

TABLE 3. Parental leave – Cox models with covariates

Model			1	2	3
Explanatory variable	Category	0 – main effect; 1 – interaction effect for first 22 months	Transition to the same job	Transition to the other job	Transition to unemployment
Years of service (ref=0-3 years)	4-6 years	0	0.037 (0.048)	-0.129 (0.071)	-0.145* (0.067)
	7-10 years	0	0.099* (0.05)	-0.197** (0.076)	-0.289*** (0.077)
	11+ years	0	0.045 (0.054)	-0.381*** (0.088)	-0.392*** (0.090)
Earnings (ref ≤ 0.7 avg. wage)	0.7 avg. wage ≤ x < 1.2 avg. wage	1	0.343** (0.125)	1.006*** (0.234)	0.510 (0.275)
		0	0.152 (0.105)	-0.384 (0.214)	-0.720** (0.222)
	≥ 1.2 avg. wage	1	0.903*** (0.233)	0.748* (0.327)	0.662 (0.700)
		0	0.003 (0.210)	0.187 (0.294)	-1.403* (0.586)
Employer branch (ref = public administration, national defense, social security, education, health care, social aid, culture and entertainment)	agriculture, mining, manufacturing, energetics and construction	1	-0.514*** (0.108)	-0.484* (0.190)	-0.146 (0.23)
		0	-0.253** (0.088)	-0.267 (0.163)	0.700*** (0.180)
	commerce, car reparation, transportation, gastronomy and hotels	1	-0.532*** (0.104)	-0.705*** (0.176)	-0.461* (0.223)
		0	-0.401*** (0.085)	-0.042 (0.151)	0.898*** (0.174)
	communication, financial, real estate, scientific and administrative services	1	-0.262* (0.131)	-0.398 (0.205)	-0.274 (0.262)
		0	-0.364*** (0.109)	0.191 (0.179)	0.643** (0.205)

Model			1	2	3
Explanatory variable	Category	0 – main effect; 1 – interaction effect for first 22 months	Transition to the same job	Transition to the other job	Transition to unemployment
Unemployment (ref= no in 2 years before leave)	yes within 2 years before leave	1	-0.525*** (0.117)	-0.226 (0.184)	-0.264* (0.121)
		0	0.057 (0.083)	-0.196 (0.144)	0.839*** (0.088)
Number of spells (events + censored)			9115	9115	9115
Number of events			3377	1368	1462
SBC without covariates			29928	15031	14858
SBC with covariates			29534	14908	14647

\*\*\* significant at 0.1%; \*\* significant at 1%; significant at 5%.

Note: Numbers in parenthesis are standard errors. Estimates are unstandardized Cox regression coefficients.

Source: own elaboration.

or other job than those with lower earnings (who are thus more likely to be entitled to child-raising allowance). This difference diminishes after the 22<sup>nd</sup> month – the earnings level loses its significance as soon as the period of eligibility for child-raising allowance is about to finish. High earnings increase the intensity of voluntarily exiting from parental leave, due to high opportunity costs. This goes in line with the neoclassical economic model of fertility [Becker, 1960]. Transition to unemployment is less likely for women with higher wages and this becomes more visible after the 22<sup>nd</sup> month; perhaps high earnings can be seen as a proxy for human capital. Length of service plays a relatively small role in the termination of leave due to transition to the same job, but it gains in importance for transition to another job or unemployment (the intensity of both decreases with length of service), though this is rather concerned with the first two years on leave. A decreasing intensity of transition to another job is coherent in view of decreasing mobility in the labor market. Public sector branches are related to a higher intensity of return to the same or other job (though after two years on parental leave the difference is reduced in the case of the same job and it diminishes in the case of another job). This could be explained by the more family-friendly policy that seems to characterize the public sector [Pylkkänen and Smith, 2004]. Direct transition to unemployment is more likely for private sector branches and this effect becomes more pronounced after two years of leave. A record of unemployment is related to a lower intensity of transition to a job in the first two years whilst on leave. It

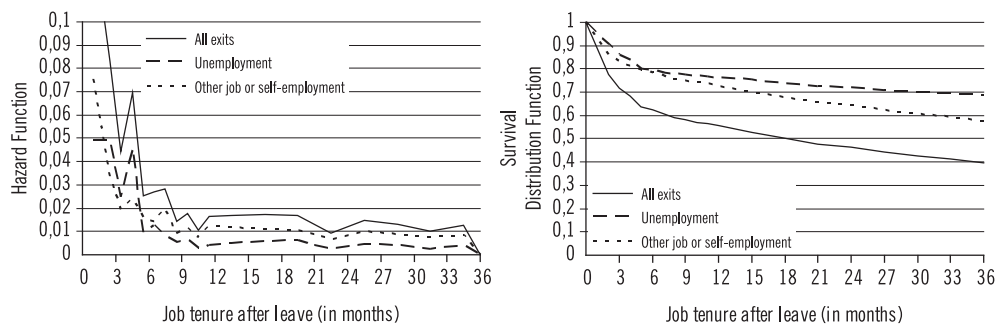
is possible that women with spells of unemployment are not going to make a successful professional career and therefore they have a smaller opportunity cost of taking longer parental leave. A past record of unemployment is related to a higher risk for the next spell of welfare, which coincides with empirical research for other countries [Harris, 1996].

## Duration of employment after parental leave – estimation results

### Life tables

Figure 4 shows the life table hazard and survival estimates of job tenure following parental leave (continuation of the previous job) by type of exit. Transition to unemployment is more rapid during the first 6 months and then the intensity of unemployment significantly falls. The unemployment transition intensity prevails during the first 5 months and then the intensity of transition to another job or self-employment becomes greater. The author used a competing risks approach, assuming implicitly the risk of transition to unemployment and to other employment or self-employment is irrelevant. Because transition to other jobs might be either voluntary or involuntary, modeling exits to unemployment has a clearer interpretation and is more suitable for indicating the possible negative impact of leave on any future professional career.

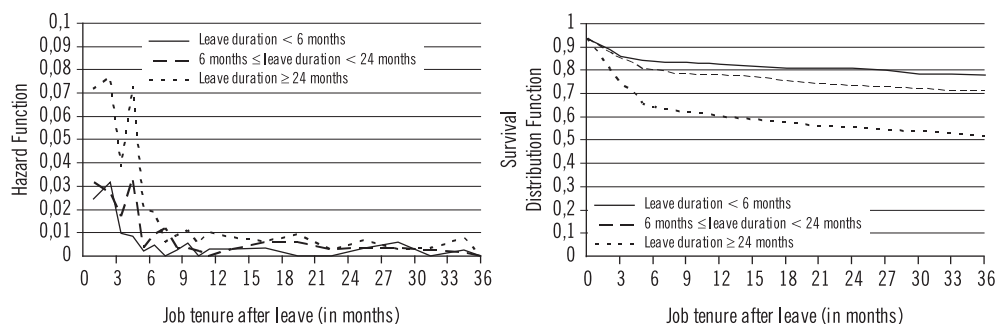
FIGURE 4. Life Table hazard and survival estimates of job tenure



Source: own preparations based on Social Insurance database.

Figure 5 presents the life table hazard and survival function estimates on the continued job tenure stratified by the length of the parental leave. Job termination and moving elsewhere but not to unemployment is treated as censoring.

**FIGURE 5. Life Table hazard and survival estimates of job tenure terminated by transition to unemployment – the effect of parental leave duration**



Source: own preparations based on Social Insurance database.

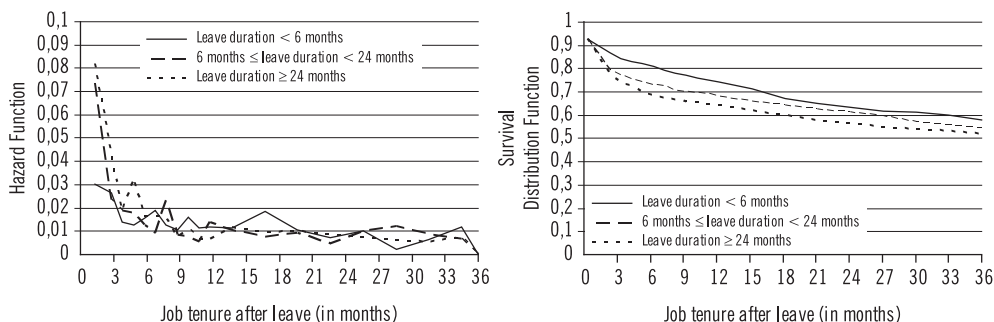
The intensity of transition to unemployment is high during the first six months and is related to the length of parental leave; then it rapidly decreases. Job protection is warranted under Polish law until the return from parental leave or – in the case of fixed-term contract – the expiry of the contract. However, women that return from leave are at a relatively high risk of redundancy despite the initial warranty of a return to the same position with financial remuneration not lower than before the parental leave. Interestingly, there is no significant peak in the transition to unemployment after 12 months following return from leave. Higher exit rates to unemployment in this period could be expected as the additional job-protection expires for those women who switched to part-time employment after returning from leave.

The duration of parental leave can be a strong determinant when considering job termination due to unemployment; censoring other exit reasons, the survival rate after six months would be respectively 90%, 86% and 70% for females that spent less than 6 months on parental leave, 6 months or more but less than 2 years, 2 years or more. Hazard curves for the crucial determinant are mirroring the proportionality. Therefore, building Cox models for transition to unemployment seems to be justified.

Figure 6 shows the life table hazard and survival estimates of the continued job tenure interrupted by the transition to another job or self-employment, censoring transition to other states. Contrary to the transition to unemployment, it cannot be clearly stated if job termination is voluntary. Therefore, the job switch presented below should not be interpreted as the result of dismissal due to earlier parental leave.

Within the first six months, the transition to another job or self-employment affects slightly more than 20% of female workers. The intensity rapidly decreases after the first 2 months. Consequently, about 64% and 58% women survive respectively 24 and 36 months, given that other exit reasons are treated as censored.

**FIGURE 6. Life Table survival estimates of job tenure – transition to another job or self-employment**



Source: own preparations based on Social Insurance database.

The results of the life table estimation by the length of the parental leave give little evidence that the duration of the parental leave determines the time to a change in employment or transition to self-employment. The shapes of hazard and survival distribution curves as well as tests of equality over strata suggest there is only a slight difference between the intensity of a job switch for both short-term and long-term parental leave. It is possible the leave might have a more pronounced impact during the first year after return than in any subsequent year. However, statistical tests of correlation between the duration of parental leave classes and Schoenfeld residuals do not confirm this claim.

### Cox models

The estimated results of the Cox model for continued job tenure after parental leave are presented in Table 4. Two models have been estimated: one for the event defined as job termination followed by transition to unemployment and the other for the event defined as job termination followed by transition to other employment or self-employment.

According to Model 4 the risk of unemployment increases along with the duration of parental leave. There are many explanations for this – a very long break in employment leads to human capital depreciation and it is poorly perceived by employers who consider the taking of leave as a signal of low job commitment or, alternatively, the employee is no longer considered necessary because the employer hires another worker that is fulfilling all the duties of the employee currently on leave. Kotowska et al. [2007] notes that finding a replacing worker is one of the most problematic factors for the employer that grants parental leave – therefore the leave-taker may encounter a negative reaction from the employer.

One of the most typical questions related to a reconciliation of the work/family imbalance is about the time female individuals need to work in order to secure their

TABLE 4. Job tenure after parental leave – Cox models with covariates

Model		4	5
Explanatory variable	Category	Transition to unemployment	Transition to other job or self-employment
parental leave duration (ref < 6 months)	6 months ≤ parental leave < 24 months	0.453**	0.169
		(0.152)	(0.093)
	≥ 24 months	1.103***	0.468***
		(0.148)	(0.099)
Years of service (ref = 0-3 years)	4-6 years	-0.339***	0.147
		(0.102)	(0.092)
	7-10 years	-0.561***	-0.042
		(0.112)	(0.095)
	11+ years	-0.540***	-0.051
		(0.120)	(0.099)
employer branch (ref = public administration, national defense, social security, education, health care, social aid, culture and entertainment)	agriculture, mining, manufacturing, energetics and construction; commerce, car reparation, transportation, gastronomy and hotels	1.379***	-0.612***
		(0.159)	(0.076)
	Communication, financial, real estate, scientific and administrative services	0.985***	-0.077
		(0.190)	(0.096)
unemployment (ref = no unemployment spell within 2 years before parental leave)	unemployment spell within 2 years before parental leave	0.794***	0.079
		(0.102)	(0.125)
Number of spells (events + censored)		3565	3565
Number of events		700	1031
SBC without covariates		6126	8607
SBC with covariates		5751	8572

\*\*\* significant at 0.1%; \*\* significant at 1%; significant at 5%.

Note: Numbers in parenthesis are standard errors. Estimates are unstandardized Cox regression coefficients.

Source: own elaboration.

position on the labor market so that they are able to interrupt their professional career by having and taking care of children. According to the estimated model, the intensity of transition to unemployment decreases with service length for the first seven years, but then we observe stabilization in the intensity for the length of service for periods of more than seven years.

Unemployment record is another determinant for the duration of job tenure following parental leave. Women that have experienced a spell of unemployment in the past are more likely to return to unemployment after returning from parental leave, though the effect can diminish along with time spent in the job after return from the leave. It coincides with other research [Böheim and Taylor, 2002; Gregg, 2001]. It is also worth to refer to Heckman and Borjas [1980] who claim past unemployment changes preferences, prices and constraints that may determine future spells of unemployment. Spells of unemployment are a strong indicator for the prospective employers the candidate is ineffective and therefore workers with an unemployment record are often able to get only less attractive or less secure job positions [Phelps, 1972; Pissarides, 1992].

Public sector branches are more secure for women taking leave than other branches, run mainly by private entities. Such results are coherent with the research from other countries, including the UK [Böheim and Taylor, 2002]. Indeed, public sector is not geared to profit generation and often lacks performance-based orientation. Consequently, while it may pay wages lower than in the private sector, it often supports reconciliation between the work/family imbalance. On the other hand, employment stability for parents returning from leave is also a result of a more complex process of dismissal for those employed in the public sector.

Model 5 confirms the first conclusions from the nonparametric model (Figure 6) that there is no significant impact of the duration of parental leave on transition to another job. We observe only a slight increase in the intensity of such transition for women that have taken very long periods of leave (two years and longer). It may be assumed that these women are redundant, but they have managed to find another job without taking unemployment benefits. Furthermore, the remaining females might move to other jobs voluntarily rather than the as a result of dismissal. The effect cannot be precisely examined as one cannot distinguish between voluntary and involuntary job termination.

## Conclusions

The paper has examined the impact of eligibility for child-raising allowance on the length of parental leave as well as the impact of the duration of parental leave on female job tenure following the taking of such leave in Poland. To achieve this, the author has used nonparametric and Cox models with time-varying covariates. Models have been based on a 1% sample of the Polish Social Security's administrative database.



The estimated models suggest a positive relation between the eligibility for child-raising allowance and the duration of the parental leave. Significant peak of hazard for women quitting the leave to the previous job about 24<sup>th</sup> month for low-earners along with no such a peak for high-earners might be clear evidence even modest child-raising allowance influences the parental leave length. Therefore, the government might manipulate the effective length of parental leave by changing the eligibility period for child-raising allowance. Past unemployment periods are related to postponing returns to the previous job within first 22 months and with increased risk of returning to unemployment after the leave. Among parental leave takers, workers employed in public sector branches are usually returning faster to their jobs.

The duration of parental leave is positively related to the intensity of transition to unemployment after returning to the same job, due to human capital depreciation, finding a replacing worker or employer antipathy. Increased intensities of transition to unemployment are observed during first 6 months after the return from the long parental leaves. Past periods of unemployment have a scarring effect on the employers that therefore offer less secure jobs; unemployment also indicates low-quality workers that more frequently return to unemployment. Females employed by private enterprises seem to have a higher intensity of transition to unemployment compared to the public sector. Taking long-term parental leave seems not to shape voluntary job switching.

Measuring the impact of the parental leave length on any further employment career progression is possible using the Social Security's dataset, promotion can be approximated by indicating an arbitrarily defined "significant" rise in the ratio of the individual to the average wage. For example, the relation between unemployment and subsequent earnings for men in the UK between 1984 and 1994 [Gregory and Jukes, 2001] has been examined using an average earnings setback of 10% on the initial re-engagement as an indicator. Job-protected parental leave aims not only to keep female workers in the labor market but also to improve both the mother's and child's health. The economic risks as loss of earned income should be taken into account along with weakening of the relationship with a spouse or partner and weakening of the ties with an employer. Looking at U.S. data, Galtry and Callister [2005] suggested a 6 month leave as optimal for maximizing these criteria in the U.S. context. Therefore, more detailed analysis could be still done to set the optimal length of parental leave for Poland.

The conclusions presented in the article should draw the policymakers' attention towards the optimal length for parental leave. Regardless of whether very long periods spent on leave are the cause or the consequence of poor work performance, women that take them should be perceived as prone to the transition to unemployment shortly after their return to work. Splitting the parental leave between both parents without the possibility of its transfer from one to another and therefore shortening the parental leave for one parent could be one of the possible solutions. Such a change would reduce the opportunities for long breaks in employment and would also support activities aimed

at reducing the gender gap. The idea should be fostered that remaining out of touch with the employer for a long period reduces the chances for a successful professional career and may actually result in a speedy return to lack of employment. Therefore, mothers spending long periods on parental leave should be encouraged to maintain their competences and keep in touch with their employers during their absence.

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## Notes

<sup>1</sup> Women represent 97% of all parental leave-takers and due to the sample size the analysis has been limited to them.

<sup>2</sup> The data contains many ties and therefore the choice of an appropriate method for handling the ties gains importance. Data on employment spells is reported on a monthly basis while the transition to and out of employment may happen on any day during the month. However, for the employees with a permanent contract and a length of service longer than 6 months, periods of notice in Poland finish on the last day of the month. Therefore, the author assumed all permanent contracts were terminated at the last day in the month, which makes the discrete method of dealing with ties more appropriate.

<sup>3</sup> Other spells have been excluded from semi-parametric models due to censoring or missing data.

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