Career sidestep, wage setback?

The impact of different types of career breaks on wages

Gert Theunissen,
Marijke Verbruggen,
Anneleen Forrier,
Luc Sels

Research Centre for Organisation Studies,
Faculteit ETEW,
K.U.Leuven

1-2007

WSE Report

Contents

Introduction

The career literature stresses the increasingly fragmented and often discontinuous nature of careers. Part of this evolution is the fact that, nowadays, people are interrupting their career more often. They may for instance quit wage employment temporarily to take care of their family, to get a degree or to start up a business. Some governments and policymakers introduce incentives for career breaks (Gould, 2004; Jones, 2005). These policies are based on the belief that career breaks may have an added value for individuals and the labor market. They may improve work-life balance, diminish the pressure on the active population, encourage lifelong learning, promote entrepreneurship and extend the labor market participation of older workers. For instance, the Employment Guidelines of the European Commission inspired several countries to develop institutionalized career break systems.

But are these positive effects of career breaks not overestimated? Critics could argue that career breaks may impede career progression. Employees who achieve a better work-life balance by taking a career break, may have to pay for this advantage by a slower career progression, fewer opportunities for promotion and a slower wage increase compared to their full-time working colleagues. Insight in the effects of career breaks is crucial to evaluate career break policies. In this paper, we study the effect of career breaks on later wages.

During the past 30 years, a great deal of empirical studies has looked into the wage effects of career interruptions (Spivey, 2005). Most research (Albrecht, Edin, Sundström & Vroman, 1999; Corcoran & Duncan, 1979; Light & Ureta, 1995; Spivey, 2005) concludes that career breaks negatively affect the pay level (or evolution) in subsequent employment. Explanations for post-break wage penalties are commonly sought in human capital and signaling theories. Career breaks are equated with periods of skill degradation and non-learning, eroding the career breaker's human capital. Furthermore, employers are believed to interpret career breaks as a signal of low commitment and below-average ambition.

However, any evolution in human capital may be largely contingent on the nature of the interruption, more specifically on the activities taken on during the career break. It is also reasonable to assume that different types of interruptions send different signals to employers. In particular, one could hardly argue that career breaks taken to pursue further education or to start a business automatically and significantly decrease human capital. Also, employers may favor an educational or self-employment spell, rather than regard it with suspicion. Besides, signals may differ between men and women. Several types of career breaks are more common among women (e.g. family leave). Men taking on such a career break may differentiate themselves more strongly from their counterparts and may therefore send a stronger signal (e.g. of low ambition) to employers. This may cause a higher wage penalty.

Most studies have measured the impact of career breaks regardless of their type or rationale (Corcoran, Duncan & Ponza, 1983; Spivey, 2005; Stratton, 1995) or only distinguishing between specific types of family leaves (e.g. household time, birth leave, parental leave) and/or unemployment spells (Albrecht et al., 1999; Arun, Arun & Borooah, 2004; Baum, 2002; Gupta & Smith, 2002). Little or no research on career breaks investigates the impact of educational leaves separately. Some studies (e.g. Spivey, 2005; Stratton, 1995) exclude people who interrupted their career for educational reasons from their sample. However, most studies do not mention how they treat educational leaves (e.g. Arun et al., 2004; Corcoran et al., 1983; Gupta & Smith, 2002; Ketsche & Branscomb, 2003) or even join educational breaks with other types of breaks into one variable (e.g. Baum, 2002). The same can be said of self-employment. Moreover, only a few

studies use a mixed-gender sample and perform the analysis separately for men and women (Spivey, 2005).

In this paper, we simultaneously study the wage effects of different types of interruptions, allowing for differential effects of break duration in function of the nature of the interruption. The types we will study are family leaves, unemployment spells, self-employment spells, educational leaves and a residual category, comprising "private" reasons to interrupt one's career (e.g. travel, rest, voluntary work). Family leaves and unemployment spells have received ample attention in literature (e.g. Albrecht et al., 1999; Arun et al., 2004; Baum, 2002; Bruce and Schuetze, 2004; Kunze, 2002), being perhaps the most obvious reasons why an individual is not working at some point in time. Our addition of self-employment spells and educational leaves is not only inspired by their under-exposure in research on career breaks, but also by the growing recognition among policy-makers of the crucial role of lifelong learning (Jones, 2005; Jenkins, Vignoles, Wolf & Galindo-Rueda., 2003) and entrepreneurship (House, 1993; Williams, 2000; Williams & Kitaev, 2005) in sustaining economic growth. It is far from certain whether career interruptions that are advocated by the government as a potential boost to employment and entrepreneurship also pay off for individuals once they return to wage employment.

Besides this focus on different types of career breaks, our study also complements previous research by conducting separate analyses for men and women. In doing so, we investigate to what extent the impact of the different types of career breaks differ between male and female workers.

The paper is structured as follows. First, we discuss the literature on career breaks. Then we present the methodology and the results. The paper concludes with a discussion on the key implications of the research and some suggestions for future research.

1. Literature

There exists a great deal of theoretical arguments about the effects of career breaks on later career wages. In the first section, we present the main arguments on the *general* wage impact of interruptions, i.e. irrespective of the break's nature. Next, we elaborate on the specific wage impact of the types of breaks included in our study. The last section focuses on the extent to which the impact of career breaks on later wages differs between men and women.

1.1 The wage impact of career breaks in general

Empirical evidence is unanimous: in general, career interruptions incur a wage penalty (Albrecht et al., 1999; Baum, 2002; Corcoran & Duncan, 1979; Light & Ureta, 1995; Spivey, 2005; Stratton, 1995). On their return to employment, workers are often found to earn less in real terms than they did prior to the break. Even if this is not the case, their wage is bound to be inferior to the pay of co-workers in similar employment who continued working.

Studies taking break duration into account (e.g. Albrecht et al., 1999; Mincer & Ofek, 1982; Nielsen, Simonson & Verner, 2004; Spivey, 2005) invariably observe a positive correlation between duration and wage penalty: the longer the interruption, the lower the subsequent wage. Studies examining curvilinear effects of career breaks (e.g. Baum, 2002; Mincer & Ofek, 1982; Spivey, 2005) observed a convex function. This implies that the negative effect of duration on the subsequent wage weakens as the duration of the spell increases.

Given the overwhelming evidence of a wage penalty, it is not surprising that theorizing is heavily skewed towards pointing out the negative consequences of career interruptions. We discuss explanations framed within human capital and signaling theory.

A great portion of the explanations for the wage depreciation induced by career breaks build on human capital theory insights (Mincer & Ofek, 1982; Mincer & Polachek, 1974). The central reasoning is that a worker's human capital decreases, or at best stagnates, during a career interruption. Outside the context of wage employment, job specific and organization specific experience diminishes, gets outdated or is rendered obsolete (Williams, 2000). Previously acquired skills, when not regularly practiced, are subject to processes of atrophy and depreciation.

Additional to existing knowledge, skills and experience evaporating or becoming outdated, there is generally no or only little accumulation of new human capital (Baum, 2002; Corcoran et al., 1983). In particular, all opportunities for advancement that would have materialized if workers did not interrupt their career are irrevocably lost. Career breakers miss out on training sessions and promotions. Given that employers base their hire and pay decisions partly on perceived or assumed experience and skill levels, it is easy to see how career breaks, and their apparently inherent human capital depreciation, will harm an employee's wage prospects.

Moreover, as Baum (2002) and Corcoran and colleagues (1983) noted, employers will have difficulties in predicting the human capital level of someone who has not been working for some time. Since there is little recent information on the person's productivity, the wage level will often be set conservatively. So even when career breakers possess many relevant skills, they may have little proof (e.g. recent project output, favorable references by past employers) to show for it.

Regardless of their real or perceived effect on human capital, career interruptions may also be penalized because of the signal they send out to potential employers (Albrecht et al., 1999; Kunze, 2002; Spivey, 2005). A career break, whatever the motivation behind it, may be interpreted as a sign that a person is not dependable ("did it once, may do it again") or has low work commitment,

which in turn may be seen as an indication of low productivity. This argument based on signaling theory helps to explain why career breaks with a likely similar effect on human capital (e.g. parental leaves and household leaves) may have a different impact on wages, as observed by Albrecht and colleagues (1999) and Kunze (2002).

In general, signaling and human capital theory explanations are rather straightforward. Yet, some authors have questioned the clear-cut causal relationship between career interruptions and re-entry wages. Alternative explanations include reverse causality (low wages provoke career interruptions) and fake causality (e.g. career breakers being of lower average ability and therefore earning less afterwards). These theories are empirically disconfirmed (Gronau, 1988; Edin & Nynobb, 1992).

1.2   The wage impact of specific types of career breaks

After having sketched out the theoretical arguments behind the impact of career interruptions on later wages in general, we now focus on the impact of specific career breaks.

Family leaves. Family leaves, including – among others – interruptions to give birth, parental leaves and time out for homemaking, have received much attention in literature. Overall, research concludes that these types of career breaks involve a wage penalty (Albrecht et al., 1999; Arun et al., 2002; Baum, 2002; Kunze, 2002). The general human capital and signaling explanations out-lined above fully apply here. Moreover, employers may presume that employees returning after a family break will be absent more often, for instance to take care of ill children or for "family emer-gencies" (Arun et al., 2002). For that reason, they may offer lower wages.

Unemployment. Empirical evidence on unemployment seems to suggest that no other type of career interruption is as harmful to an employee's wage prospects. Bruce and Schuetze (2004) found that unemployment spells cause a more severe wage penalty than self-employment. Albrecht and colleagues (1999) observed unemployment spells to be more harmful than breaks for family reasons or for military service. Mincer and Ofek (1982) noted that interruptions due to layoff have a greater than average wage depreciation effect.

Essentially, this finding is an illustration of the scarring effect (Heckman & Borjas, 1980): unem-ployment often inflicts a long-term scar, through the heightened future incidence of unemployment and lower earnings in subsequent employment. A non-negligible part of the labor force gets trapped in a vicious cycle, in which unemployment spells are merely interrupted by unstable, low-pay employment spells (Gregory & Jukes, 2001).

Self-employment. Self-employment breaks have been widely ignored in studies on the effect of career breaks on wages. While some authors explicitly exclude individuals with self-employment spells from the sample (e.g. Gupta & Smith, 2002), most are simply unclear about how they treat self-employment spells (for instance, whether they do not consider them at all, include them as work experience or as career breaks). We found some studies within the entrepreneurial literature that did investigate the impact of self-employment spells on the subsequent career. Their findings on the wage impact are ambiguous. Bruce and Schuetze (2004) found that short spells of self-employment do not increase – and probably actually reduce – average hourly earnings on re-entry. Conversely, Hamilton (2000) discovered that the wages of ex-entrepreneurs are not significantly different from the earnings of non-interrupting employees and in some cases are actually higher. In a sample of white men, Evans and Leighton (1989) came to a similar conclusion.

Several authors refer to human capital theory to explain non-negative wage effects of self-employ-ment spells. Compared to career breaks not involving professional activities, self-employment substantially reduces the risk of skill atrophy (Williams, 2000). Additionally, during self-employment

individuals accumulate human capital that may be useful in wage employment situations (Niefert, 2006). In particular, self-employment experience may be regarded favorably by employers who approve of employees displaying entrepreneurial attitudes, such as willingness to perform and self-direction (Douglas & Shepherd, 2000). Apart from its signaling value, future employers may also see opportunities for attracting previous business contacts and clients of the entrepreneur. Actually, this social network may also help entrepreneurs to obtain a lucrative job on their return to wage employment.

There are equally sound theoretical arguments why self-employment could negatively affect wages. Skills acquired during self-employment could hold little appeal to future employers (Evans & Leighton, 1989). Moreover, some skills valued by employers may be lost or remain un(der)developed during self-employment (Williams, 2004). Also, individuals who exit self-employment may be associated with failure. Niefert (2006) notes that this signal could be all the more negative if the self-employment is preceded by unemployment, an order of events that casts suspicion on the motivation behind the entrepreneurship (an act of despair, rather than an ambitious employee pursuing her or his own business idea).

Several authors also devote attention to possible self-selection effects (e.g. William, 2004). People who are less attractive to employers or who earn low pre-break wages may be more inclined to try their luck in self-employment. Their lower post-break wages are then not merely caused by their self-employment spell, but also by personal abilities.

Educational leaves. Educational leaves and their impact on earnings have received little or no attention in empirical research. Studies examining effects of adult education are rarely clarifying whether the adult learners being investigated interrupted their employment career or not. Evidence emerging from these studies is mixed (Vignoles, Galindo-Rueda & Feinstein., 2004). Jenkins and colleagues (2003) found that, except for the least qualified employees, acquiring a formal qualification in adulthood does not yield higher wages. Egerton and Parry (2001) and Liu and Xiao (2006), on their turn, concluded that adult education positively affects wages. Blundell, Dearden, Goodman and Reed (1997), Egerton (2000) and Steel and Sausman (1997) concluded that earning a graduate degree in adulthood pays off, yet less than earning the same degree before entering the labor market.

Theoretical explanations cover both the positive and negative effects associated with educational leaves. Based on human capital theory, one expects lifelong learners to benefit financially, since any serious investment in education will boost an employee's human capital level. This may raise employer's productivity expectations and increase wages (Becker, 1964; Egerton, 2000; Vignoles et al., 2004). Moreover, individuals who re-enter education, often at great personal expense, may send a clear signal to employers that they are keen to learn, motivated to advance their careers, and that they recognize the necessity of updating competencies regularly.

On the other hand, the signal may just as well be negative. Interrupting one's career to start or resume an educational program could be considered as a sign of poor ability or an indication of low educational motivation as a youngster (Egerton, 2000; Jenkins et al., 2003; Vignoles et al., 2004). Finally, if the degree is perceived to be of little practical use (e.g. an accountant getting a master in philosophy), there may be a double backlash: the newly acquired human capital will go unrewarded and the career breaker may be marked as a freewheeler, lacking career commitment (Jenkins et al., 2003; Vignoles et al., 2004).

1.3   Gender differences in the impact of career interruptions on re-entry wages

Most studies investigating the impact of career breaks on wages focused on women (Spivey, 2005; e.g. Arun et al., 2004; Baum, 2002; Corcoran et al., 1983; Gustafsson, 1981; Stratton, 1995). This practice stems from the conviction that career breaks – being more common among women – explain part of the gender wage gap (Baum, 2002). Only recently, researchers have started to include men in their samples. The studies using a mixed-gender sample generally find that men are penalized more severely for career breaks than women (e.g. Albrecht et al., 1999; Egerton & Parry, 2001; Stafford & Sundström, 1996; Light & Ureta, 1995; Spivey, 2005).

Signaling theory offers an explanation for this finding. Since career breaks are less common among men (Li & Currie, 1992), men send out a much stronger signal when taking a break. Hence, the penalty is likely to be more severe. Following this line of reasoning, it can further be expected that gender differences will be larger for types of career break that are more 'feminine', that is, more common among women. This is in line with the findings of Albrecht and colleagues (1999), who observed that parental and household leaves were more damaging for men than 'masculine' interruptions for military service.

Our literature overview reveals that empirical findings are inconsistent. Moreover, most studies focus on only one or two types of career breaks and rarely look at gender differences. This paper complements and extends existing research by examining the effects of self-employment spells and educational leaves jointly with the more traditional family-related leaves and unemployment spells. Furthermore, we examine gender differences and allow for curvilinear effects of duration for each career break type.

2.   Methods

2.1   Participants and procedures

We conducted analyses on data from Belgium's largest cross-sectional wage survey among employees. Participants were recruited by two widespread weekly job magazines, one published in Dutch and targeting the Flemish population, the other primarily serving French-speaking Belgians. We collected the data in May 2006, through a bilingual website. Slightly abridged versions of the questionnaires were printed in both job magazines, allowing respondents to fill in the survey on paper and return it by mail.

Participation in the study was voluntary. Pre-survey instructions made clear that the research was aimed at active employees, including part-time and temporary workers, but excluding anyone who was not working for an employer in April 2006 (students, the unemployed, self-employed and retired). To boost participation, two substantial cash prizes (equivalent to the winner's monthly wage) were randomly awarded after data collection.

After deletion of incomplete and duplicate records, a database of 62,284 employees was compiled and subjected to rigorous data cleaning. We retained 57,480 data points on monthly wage. Of the 62,284 respondents, 25,679 (41%) were female and 16,228 (26%) were French-speaking. Of all observations, 98,4% was collected via the Internet. To compensate for the non-random sampling, a weight factor was generated which corrects the combined sample distribution of age and educational level to Belgian population data of 2005.

2.2   Measures

Our dependent variable is the natural logarithm of the gross wage respondents earned in April 2006. If wages were paid on a (bi)weekly basis, participants were asked to calculate the total amount earned in April 2006. In case of major monthly fluctuations, respondents were instructed to fill in the average wage of the past three months. Data cleaning involved checks on the ratio of the gross to the net wage. The credibility of outlier wages was assessed by reviewing the corresponding job profiles. In a final step, part-timers' wages were transformed to their full-time equivalent.

Our independent variables of interest originate from a five-item question on career interruptions. In translation, the question read "Since starting your first job, have there been periods in which you were not working as an employee in the service of a company or organization?" The instruction asked participants to fill in the number of months their career has been completely and primarily interrupted for reasons expressed in each item. The five options comprised leaves for family reasons (pregnancy, child and elder care), unemployment spells, self-employment spells, educational leaves (start or restart an educational program) and breaks for "other reasons (e.g. travel, rest, voluntary work)". The answers amount to a detailed indication of total break duration for each type. We cleaned the data and transformed the units from months to years. To be able to check for curvilinearity, we also calculated the quadratic terms for each of the five duration variables.

We include a broad set of controls to allow an estimation of the net wage impact of career breaks, holding constant most traditional wage determinants. Controls fall into four categories (Milkovich & Newman, 1999). The first group consists of indications of the worker's human capital (Becker, 1964): educational level and years of wage employment experience, calculated as years since first (wage) employment minus the total duration of all career interruptions. The second set of controls comprise job characteristics, focusing on functional domain (e.g. marketing, sales, IT) and hierarchical level, measured as job level, budget responsibility and number of subordinates. A third group was made up by two organizational features, industry and the number of employees, as a measure of company size. The fourth category of controls relates to the labor contract: term, number of working hours and a dummy for part-time work.

2.3   Analyses

We conducted OLS regressions on the natural logarithmic transformation of the full-time equivalent monthly gross wage. The same equation, including the ten career break duration variables (five linear and five quadratic terms) and the controls as presented above, was estimated separately for men (n=25,541) and women (n=18,838). We used SAS software to estimate the intercept and the unstandardized regression coefficients, together with the models' adjusted R^2.

3.   Results

Table 1 displays the means and standard deviations of all variables, as well as their correlations with the key variables. Correlations among the control variables are not included in the table, but a check did not reveal any problems of multicollinearity.

Table 1.   Descriptive statistics of all variables and Pearson's correlations with key variables

Variable	Mean	s.d.	1	2	3	4	5	6	7	8
1. Log monthly gross wage (log €)	7.86	0.39								
2. Gender = male	0.58	0.49	.25***							
3. Wage employment (years)	10.8	8.70	.37***	.12***						
4. Family leaves (years)	0.18	0.85	-.06***	-.22***	.09***					
5. Unemployment (years)	0.33	0.83	-.15***	-.07***	.11***	.09***				
6. Self-employment (years)	0.30	1.63	.02***	.03***	.02***	.01	.03***			
7. Educational leaves (years)	0.07	0.40	-.03***	-.02***	-.02***	.04***	.11***	.02***		
8. Other breaks (years)	0.06	0.46	-.01*	-.01**	.04***	.01**	.06***	.02***	.05***	
9. Degree = higher education of 1 cycle	0.34	0.47	-.06***	-.08***	-.05***	.01*	-.06***	-.03***	-.01*	-.01
10. Degree = higher education of 2 cycles	0.12	0.32	.14***	.10***	-.08***	-.02***	-.07***	-.02***	-.02***	-.02***
11. Degree = university	0.23	0.42	.28***	.00	-.15***	.01*	-.08***	-.03***	.01*	-.01*
12. Domain = general management	0.08	0.27	.27***	.09***	.07***	-.03***	-.04***	.04***	-.01*	-.00
13. Domain = administration	0.16	0.36	-.16***	-.26***	.00	.07***	.06***	-.01**	.01*	.01*
14. Domain = technical support	0.08	0.27	-.01**	.10***	.07***	-.01*	.03***	.007	-.01	-.00
15. Domain = marketing	0.04	0.19	.03***	-.04***	-.05***	-.02***	-.02***	-.01	.00	-.00
16. Domain = sales	0.14	0.34	-.01*	-.01	-.01**	-.01**	-.00	-.03***	-.01*	-.01*
17. Domain = after sales services	0.02	0.13	-.03***	.09***	.02***	-.01**	-.00	.02***	-.00	0.00
18. Domain = finance	0.07	0.26	.02***	-.04***	-.01	.00	-.02***	-.02***	-.01*	-.02***
19. Domain = HRM	0.04	0.20	.02*	-.10***	.00	.02**	-.02***	-.01**	-.00	.01
20. Domain = R&D	0.05	0.21	.05***	.02***	-.08***	-.02***	-.04***	-.03***	.00	-.01
21. Domain= engineering	0.04	0.19	.05***	.12***	-.05***	-.03***	-.04***	-.01**	-.00	-.01*
22. Domain = ICT	0.09	0.29	.06***	.18***	-.06***	-.04***	-.03***	-.03***	-.01	-.01*
23. Domain = operations	0.16	0.37	-.15***	-.05***	.03***	.05***	.06***	.00	.03***	.03***
24. Job level = top manager	0.02	0.14	.19***	.06***	.10***	-.01**	-.01	.07***	.01	0.00
25. Job level = senior manager	0.04	0.20	.28***	.10***	.15***	-.01**	-.03***	.04***	-.01	-.00
26. Job level = middle manager	0.19	0.39	.28***	.12***	.08***	-.03***	-.07***	.01**	-.02***	-.01*
27. Job level = professional	0.25	0.43	.09***	.08***	-.07***	-.04***	-.06***	-.01**	.00	-.01
28. Job level = operational	0.39	0.49	-.34***	-.05***	-.07***	.03***	.09***	-.02***	.01*	.01**
29. Budget > 0 €	0.13	0.33	.11***	.06***	.05***	-.02***	-.04***	.01*	-.01	-.00
30. Budget > 2499 €	0.05	0.23	.17***	.08***	.06***	-.02***	-.04***	.03***	-.00	-.01
31. Budget > 24999 €	0.05	0.23	.27***	.11***	.08***	-.03***	-.04***	.04***	-.00	-.00
32. Number of subordinates > 0	0.29	0.45	.35***	.19***	.18***	-.04***	-.07***	.05***	-.01*	-.01
33. Number of subordinates > 5	0.13	0.34	.29***	.16***	.19***	-.03***	-.05***	.03***	-.001	.00
34. Number of subordinates > 15	0.05	0.22	.18***	.11***	.13***	-.02***	-.04***	.02***	-.00	-.00
35. Number of subordinates > 29	0.02	0.15	.14***	.08***	.10***	-.01**	-.02***	.01	-.01	.00
36. Sector = metallurgy	0.09	0.28	.06***	.13***	.04***	-.03***	-.03***	-.01**	-.02***	-.01*
37. Sector = chemicals	0.05	0.21	.11***	.06***	.04***	-.02***	-.03***	-.02***	-.02***	-.01
38. Sector = pharmaceutics	0.03	0.16	.07***	-.03***	-.03***	-.01	-.03***	-.01	-.01	-.01
39. Sector = food industry	0.03	0.16	.03***	.02***	.01	.00	-.01	.01	-.01**	.00
40. Sector = construction	0.03	0.17	-.01**	.04***	.00	-.01	-.01	.03***	.00	-.01
41. Sector = wood industry	0.02	0.14	.01	.03***	.03***	-.02**	-.01	.00	.00	.00

Variable	Mean	s.d.	1	2	3	4	5	6	7	8
42. Sector = textile industry	0.01	0.11	-.01**	-.03***	.01	.00	.00	.01	-.01	-.01
43. Sector = energy and utilities	0.01	0.12	.02***	.03***	-.01	-.01**	-.01*	.00	.00	.00
44. Sector = ICT	0.08	0.27	.05***	.13***	-.06***	-.04***	-.04***	-.02***	.00	-.01
45. Sector = banking	0.06	0.24	.06***	-.01	.00	-.02**	-.03***	-.01*	-.01**	-.01*
46. Sector = business	0.06	0.24	.00	-.04***	-.08***	-.01	-.03***	-.01	.00	-.01*
47. Sector = transport and logistics	0.06	0.24	-.01	.04***	.04***	-.01*	.00	.01**	-.01	.00
48. Sector = retail and wholesale	0.06	0.24	-.10***	-.03***	.00	.02***	.03***	.04***	-.01	.00
49. Sector = telecommunications	0.04	0.19	.04***	.04***	-.03***	-.01**	-.01	-.01**	.00	.00
50. Sector = advertising and media	0.03	0.18	-.03***	-.03***	-.06***	-.01*	.00	.02***	.00	.00
51. Sector = HR services	0.02	0.14	-.02***	-.08***	-.04***	.01	-.01**	-.01	-.01	.00
52. Sector = tourism and leisure activities	0.01	0.10	-.06***	-.05***	-.02***	.00	.01*	.00	.00	.02***
53. Sector = company services	0.03	0.17	-.05***	-.01	.02***	.02***	.04***	.02***	.00	.01
54. Sector = health care	0.06	0.23	-.02***	-.12***	.01	.09***	-.01	.00	.03***	.01**
55. Sector = education	0.05	0.22	-.03***	-.09***	.00	.03***	.01*	-.02***	.02***	.02**
56. Sector = federal government	0.04	0.19	-.02***	.02***	.07***	-.01*	.01**	-.01	.01**	.01
57. Sector = welfare services	0.03	0.17	-.05***	-.08***	.00	.03***	.05***	.00	.01*	.01**
58. Sector = local government	0.03	0.17	-.04***	-.02***	.04***	.02***	.05***	-.01	.01	.00
59. Sector = regional government	0.02	0.13	.00	-.02***	.01***	.00	.02***	.00	.00	.00
60. Sector = cultural services	0.01	0.12	-.04***	-.04***	-.01*	.01**	.05***	.00	.03***	.01**
61. Sector = international government	0.01	0.09	.03***	-.01	.02***	.00	.02***	.00	.01**	.00
62. Sector = agriculture	0.00	0.05	-.02***	.00	.00	.00	.00	.01*	.00	.00
63. Number of employees > 9	0.89	0.32	.14***	.06***	.03***	-.02***	-.07***	-.07***	-.02***	-.01
64. Number of employees > 49	0.69	0.46	.17***	.06***	.05***	-.02***	.07***	-.06***	-.02***	-.01*
65. Number of employees > 199	0.50	0.50	.16***	.06***	.05***	-.02***	-.05***	-.05***	-.02***	-.00
66. Number of employees > 199	0.36	0.48	.14***	.05***	.05***	-.01*	-.04***	-.05**	-.02**	.00
67. Number of employees > 999	0.27	0.44	.12***	.05***	.05***	-.01**	-.03***	-.04***	-.01**	.00
68. Contract = temporary	0.07	0.28	-.14***	-.09***	-.18***	-.01	.06***	-.01*	.03***	.01
69. Contract = agency worker	0.03	0.16	-.13***	-.05***	-.07***	.01	.06	.01	.03***	.01*
70. Weekly working hours	41.7	8.87	.30***	.27***	.03***	-.14	-.13***	.04***	-.02***	-.03***
71. Employment = part-time work	0.10	0.30	-.04***	-.28***	.08***	.20***	.13***	.01**	.03***	.03***

n=44,384

*   p<.05

**   p<.01

*** p<.001

As table 1 shows, duration of the two work spells (wage employment and self-employment) is positively correlated with the logarithm of wage. However, earnings are negatively correlated with the duration of the four non-work spells (family leaves, unemployment, educational leaves and other breaks). All five career break types correlate positively with each other, suggesting that breaks of one type do not exclude, but rather go hand in hand with interruptions of another type. The only exception is the correlation between the duration of self-employment and family leaves, which does not differ significantly from zero.

Table 2 reports gender-specific differences in monthly wage, years in employment and duration of career breaks. The gender wage gap amounts to approximately 650 euro in gross monthly compensation. The most striking result concerns the occurrence and average duration of family leaves. While four out of ten women interrupted their career for family reasons, only 3.3% of men did the same. To a large part, this difference is due to the inclusion of childbirth leaves in our description of family leaves. In addition, the average man has a shorter history of unemployment and a slightly longer history of self-employment than the average woman. Female and male employees interrupt their career roughly in equal measure for educational purposes and "other reasons".

Table 2.   Gender-specific descriptive statistics of key variables

	Men			Women		
Variable	Mean	s.d.	% break [a]	Mean	s.d.	% break [a]
Monthly gross wage (€)	3 108.36	1 540.66		2 462.76	1 174.02	
Log monthly gross wage (log €)	7.95	0.40		7.74	0.35	
Wage employment (years)	11.82	9.29		9.73	8.17	
Family leaves (years)	0.02	0.18	3.3	0.41	1.27	39.0
Unemployment (years)	0.28	0.68	41.2	0.41	1.03	45.9
Self-employment (years)	0.36	1.85	8.3	0.25	1.44	6.6
Educational leaves (years)	0.07	0.41	5.5	0.08	0.42	6.9
Other breaks (years)	0.06	0.41	7.8	0.07	0.60	7.2

[a]   Percentage of employees who have taken at least one career break of the specified type that lasted at least one month

Table 3 reports the regression results for men and women.

Table 3. OLS results of gender-specific wage regressions

Dependent variable: log monthly gross wage	Men [a] β	sign.	% change	SE	Women [b] β	sign.	% change	SE
Wage employment (years)	.032	***	3.29 [c]	.0004	.024	***	2.44 [c]	.0008
Wage employment (years²)	-.001	***	-0.05	.0006	.000	***	-0.03	.0000
Family leaves (years)	-.046	**	-4.46	.0024	-.010	***	-1.04	.0024
Family leaves (years²)	.000		0.00	.0142	.000		0.01	.0001
Unemployment (years)	-.072	***	-6.95	.0022	-.040	***	-3.95	.0028
Unemployment (years²)	.004	***	0.36	.0032	.002	***	0.21	.0002
Self-employment (years)	.000		0.04	.0180	.001		0.15	.0024
Self-employment (years²)	.000		0.01	.0016	.000		0.01	.0001
Educational leaves (years)	.011		1.06	.0001	-.012		-1.16	.0101
Educational leaves (years²)	-.002		-0.21	.0093	.002		0.19	.0029
Other breaks (years)	-.022	***	-2.18	.0004	.015	**	1.46	.0054
Other breaks (years²)	.001	**	0.12	.0054	-.001	***	-0.14	.0004
Degree = higher education of 1 cycle [e]	.112	***	11.88	.0000	.125	***	13.32	.0049
Degree = higher education of 2 cycles	.209	***	23.29	.0045	.234	***	26.38	.0115
Degree = university	.302	***	35.24	.0071	.293	***	34.09	.0072
Domain = general management [e]	.114	***	12.06	.0057	.077	***	8.02	.0149
Domain = administration	.046	***	4.75	.0097	-.006		-0.57	.0114
Domain = technical support	.044	***	4.49	.0097	-.079	***	-7.57	.0143
Domain = marketing	.070	***	7.27	.0089	.035	*	3.51	.0155
Domain = sales	.093	***	9.72	.0132	.000		-0.03	.0120
Domain = after sales services	.042	***	4.30	.0087	-.021		-2.08	.0332
Domain = finance	.070	***	7.25	.0123	.032	*	3.21	.0127
Domain = HRM	.040	**	4.06	.0105	.028	*	2.81	.0136
Domain = R&D	.087	***	9.05	.0132	.023		2.28	.0170
Domain= engineering	.106	***	11.19	.0124	.075	**	7.80	.0282
Domain = ICT	.112	***	11.80	.0114	.082	***	8.57	.0167
Domain = operations	.057	***	5.90	.0096	.004		0.39	.0121
Job level = top manager [e]	.400	***	49.15	.0087	.187	***	20.52	.0196
Job level = senior manager	.376	***	45.61	.0140	.201	***	22.26	.0152
Job level = middle manager	.224	***	25.10	.0115	.136	***	14.52	.0085
Job level = professional	.146	***	15.77	.0093	.087	***	9.09	.0070
Job level = operational	.036	***	3.71	.0088	-.008		-0.82	.0058
Budget > 0 € [e]	.017	***	1.73	.0085	.024	***	2.48	.0069
Budget > 2499 €	.052	***	5.36	.0053	.081	***	8.44	.0122
Budget > 24999 €	.139	***	14.92	.0073	.122	***	12.93	.0142
Number of subordinates > 0 [e]	.023	***	2.36	.0074	.037	***	3.80	.0070
Number of subordinates > 5	.020	**	2.02	.0050	.007		0.66	.0108
Number of subordinates > 15	-.027	**	-2.64	.0064	-.011		-1.08	.0185
Number of subordinates > 29	.011		1.08	.0093	.043	*	4.36	.0257
Sector = metallurgy [e]	.126	***	13.38	.0116	.084	***	8.76	.0138
Sector = chemicals	.250	***	28.34	.0105	.175	***	19.15	.0151
Sector = pharmaceutics	.214	***	23.86	.0117	.202	***	22.33	.0163
Sector = food industry	.115	***	12.18	.0153	.055	**	5.66	.0171
Sector = construction	.066	***	6.85	.0133	.056	***	5.79	.0166
Sector = wood industry	.125	***	13.30	.0131	.057	**	5.89	.0189
Sector = textile industry	.092	***	9.60	.0137	.044	*	4.47	.0179
Sector = energy and utilities	.202	***	22.43	.0183	.088	***	9.21	.0242
Sector = ICT	.148	***	15.99	.0161	.091	***	9.52	.0154
Sector = banking	.163	***	17.73	.0112	.125	***	13.34	.0130
Sector = business	.138	***	14.78	.0118	.064	***	6.65	.0132
Sector = transport and logistics	.110	***	11.64	.0129	.087	***	9.14	.0132
Sector = retail and wholesale	.031	**	3.15	.0109	-.027	*	-2.71	.0121
Sector = telecommunications	.180	***	19.71	.0112	.098	***	10.32	.0154
Sector = advertising and media	.101	***	10.58	.0126	.072	***	7.41	.0150
Sector = HR services	.103	***	10.90	.0140	.037	*	3.81	.0161
Sector = tourism and leisure activities	.000		-0.05	.0205	-.045	*	-4.44	.0187
Sector = company services	.043	**	4.42	.0222	.007		0.75	.0145
Sector = health care	.116	***	12.35	.0132	.078	***	8.14	.0122
Sector = education	.054	***	5.50	.0134	.049	***	5.05	.0134
Sector = federal government	.031	*	3.20	.0140	-.017		-1.69	.0150
Sector = welfare services	.016		1.64	.0124	.017		1.75	.0135
Sector = local government	.014		1.40	.0147	-.002		-0.19	.0143
Sector = regional government	.054	**	5.55	.0137	.018		1.81	.0172
Sector = cultural services	-.019		-1.90	.0165	.002		0.22	.0177

Dependent variable: log monthly gross wage	Men [a]				Women [b]			
	β	sign.	% change	SE	β	sign.	% change	SE
Sector = international government	.234	***	26.42	.0194	.150	***	16.15	.0227
Sector = agriculture	.092	**	9.59	.0210	-.054		-5.22	.0437
Number of employees > 9 [e]	.060	***	6.16	.0354	.062	***	6.39	.0068
Number of employees > 49	.040	***	4.08	.0067	.038	***	3.90	.0063
Number of employees > 199	.030	***	3.07	.0056	.019	**	1.95	.0072
Number of employees > 199	.008	***	0.77	.0060	.001		0.07	.0087
Number of employees > 999	.034		3.49	.0073	.006		0.62	.0079
Contract = temporary [e]	-.032	***	-3.19	.0065	-.051	***	-4.93	.0074
Contract = agency worker	-.094	***	-8.97	.0082	-.078	***	-7.50	.0107
Weekly working hours	.004	***	0.40	.0125	.004	***	0.39	.0003
Employment = part-time [e]	.179	***	19.59	.0002	.137	***	14.72	.0058
Intercept	6.937	***	1030 [d]	.0180	7.074	***	1180 [d]	.0199
Adjusted R²	.57 ***				.44***			

[a]   n=25,541

[b]   n= 18,838

[c] $(e^{\beta}-1)*100$, to be interpreted as the percentage wage change due to a unit increase in the predictor variable

[d] $e^{intercept}$, to be interpreted as the starting wage for the reference employee

[e]   Reference categories: degree = lower education; domain = logistics; job level = administrative; budget = smaller than specified; number of subordinates = smaller than specified; sector = hotel and catering; number of employees = smaller than specified; contract = permanent; employment = full-time

* $p<.05$

** $p<.01$

*** $p<.001$

Consistent with other research (e.g. Albrecht et al., 1999; Spivey, 2005), we find a positive effect of years in wage employment. The quadratic terms, which are significantly negative in both models, imply a gradual but slow decrease in the return on wage employment experience. Additionally, we see that the return on an extra year of wage employment is smaller for women than for men.

Family leaves have a negative impact on wages. The wage penalty is especially severe for male employees: a one-year family-related leave is equivalent to a 4.5% penalty in monthly wage (with the percentage change in wage level calculated as $(e^{\beta}-1)*100$). For women, the financial penalty is only 1%.

Similar effects are found with respect to the duration of unemployment spells. Unemployment spells lead to lower wages for both men and women. However, the penalty for one extra year spent in unemployment gets less severe the longer the spell lasts. Again, the penalty is stronger for men.

The duration of self-employment spells does not have a significant effect on the current wage. In addition, the effect of one year of self-employment on earnings is significantly lower than the effect of one year in wage employment (at least for the first 33 years in the male regression model and for the first 18 years in the female regression), as there is no overlap in the 95% confidence intervals. A self-employment trial is rewarded less than spending the same amount of time in wage employment. Yet, self-employment does not involve a direct wage penalty either. These results apply to men and women alike.

The wage impact of the duration of educational leaves is positive for men and negative for women. However, both coefficients are insignificant.

Career breaks for other reasons (e.g. travel) have a decreasingly negative effect on men's wages. For women, the wage impact is positive at a decreasing rate.

Figure 1 visualizes the evolution of the log wage penalty/premium of wage employment and the five career break types as a function of their duration.

Figure 1.   Impact of wage employment and five types of career breaks on wages of male and female employees (regression results)
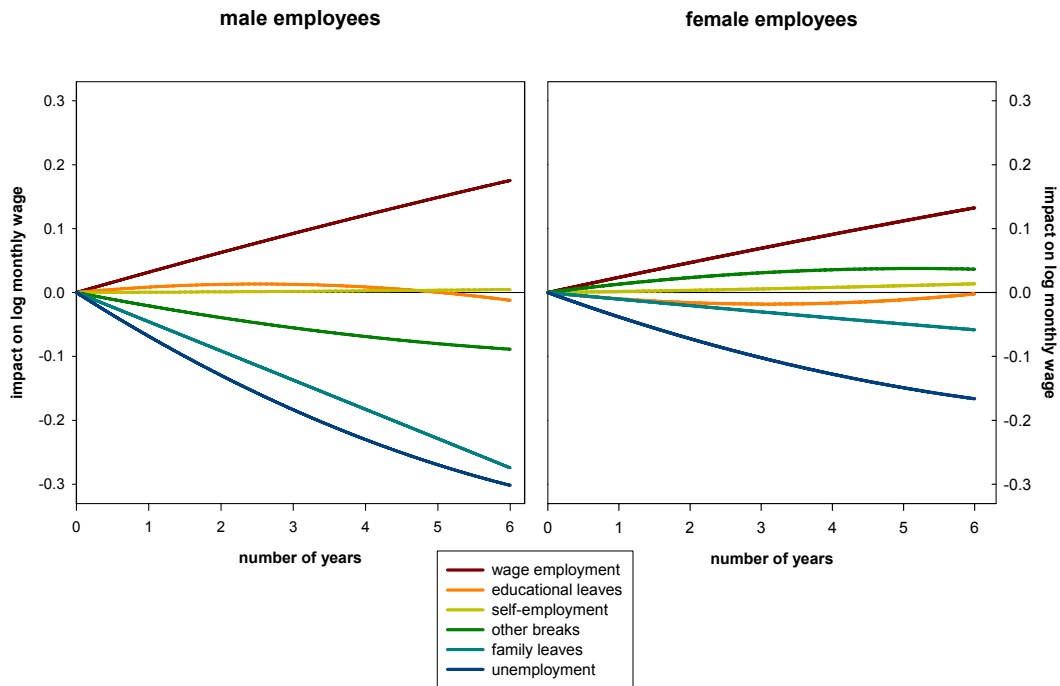
Comparing the different types of career interruptions, we see that unemployment spells incur the most severe wage penalties, followed by family leaves. For men, the effects of these two types of breaks do not differ greatly. For women the gap between both lines is more substantial, illustrating that female employees have to pay a higher price for unemployment periods than for family leaves. Educational leaves and self-employment trials do not cause a significant wage penalty, nor are they rewarded in their own right. This finding applies to men and women alike. Finally, figure 1 clearly shows that the significant effects of wage employment, family breaks and unemployment are far more pronounced for men than for women.

4.   Discussion

We examined the wage implications of different types of career breaks among a sample of more than 44,000 Belgian employees. We complemented existing research in several ways. In line with recent studies in this area (e.g. Spivey, 2005), we used a mixed-gender sample and performed the analysis separately for men and women. We included several types of interruptions in our model. Apart from the traditional family-related breaks and unemployment spells, we also took self-employment spells and educational leaves into account. Furthermore, we included the quadratic terms of the break duration variables. This allows us to map out the relationship between the duration of the interruption and the later wage into more detail compared to studies investigating a simple linear relationship (e.g. Albrecht et al., 1999; Gullason, 1991).

Our analyses revealed some interesting findings. First, different types of career breaks were shown to exert different effects on wages. We found a wage penalty for unemployment spells and family breaks, while the wage impact of self-employment and educational leaves was insignificant. This is in line with the human capital and signaling arguments outlined in the literature section. The decrease in human capital caused by unemployment and family leaves may lower the wage. Moreover, these breaks may signal a lack of ability (unemployment) or commitment (family leave) to employers. The zero-effect of self-employment and educational leaves can also be explained by human capital and signaling effects. Although self-employment spells and educational leaves may cause a loss of job- and organization-specific knowledge and skills, this loss may be compensated by an increase in human capital acquired during self-employment or through education. Furthermore, depending on the specific skill requirements, these career breaks may be considered by employers as either an asset or as a sign of low commitment.

Not only did some types of break have an effect on wages while others did not, the effect of break duration turned out to vary as well. In the case of unemployment spells, the wage depreciation slowed down gradually. The impact of family breaks, on the other hand, did not decrease with duration. This implies that, after a certain time out, the wage penalty for family leaves may exceed the one for unemployment. In our sample, this was found to happen after 7 years in the case of men and after 14 years for female workers. A possible explanation is that, after a considerable time out, the human capital depreciation effect diminishes in relative importance (e.g. because skills and knowledge have attained some minimum level) and the impact of signaling starts to dominate. Lengthy family-breaks and long-term unemployment spells may generate different signals. Family-related breaks may be considered as a conscious choice "against" one's career and may therefore be penalized more severely than unemployment spells, which may be perceived to imply some willingness to work.

Third, we found some interesting gender differences. Family breaks and unemployment spells seem to be more harmful for male than for female employees. This is consistent with our expectations. Since these types of breaks are generally less common among men (in our sample too, see table 2), the signal associated with them – and hence the wage impact – is likely to be more negative for men than for women. The gender difference is most pronounced for the family-related breaks, which can indeed be considered the most 'feminine' among the interruption types. However, in light of the persisting gender wage gap (Baum, 2002; Blau & Ferber, 1990; Gullason, 1991), it is plausible that men with a history of family leaves are still earning more than female workers with a similar background.

We did not find any gender differences for the effects of self-employment and educational leaves. The wage penalty for these breaks is non-significant for both sexes. By contrast, the impact of the residual 'other' career breaks differed substantially. For men, the impact was negative at a decreasing rate. For women, other breaks had a positive impact on the subsequent wage, with the positive effect slowing down as the spell continues. An explanation could be that the activities undertaken by men and women during these breaks differ. Perhaps, men fill their 'other' breaks with non-work activities, such as travel or rest, while women use their 'other' breaks to work without being formally employed, for instance, in their husband's business. If this assumption is true, the (small) wage premium could be related to the human capital women accumulate during such interruptions.

In sum, we found that the effects of career breaks vary with the break type, the break duration and with gender. Except for 'other breaks' taken by women, none of the career break types had a positive effect on the subsequent wage, although educational leaves and self-employment spells were not penalized either.

Our findings can be useful to employees considering a career break. Insight in the effects on subsequent earnings may influence career-related decisions. The non-positive wage effect of educational leaves and self-employment spells may be of interest to policy makers. Many governments are nowadays looking for ways to enhance lifelong learning (Griffin, 2006; Jones, 2005) and entrepreneurship (Williams, 2000; Williams & Kitaev, 2005). The lack of financial reward (no higher subsequent wages) may discourage individuals to engage in adult education or in an entrepreneurial project. This barrier may be heightened by other financial implications, such as the wage loss and lack of wage growth during the break, the costs incurred by courses (in case of an educational leave) and the financial capital needed to start a business (in case of a self-employment trial). Governments may want to look into these potential barriers and search for ways to deal with them.

4.1 Limitations and future research

Several limitations of our study merit discussion. First, notwithstanding the large size of our dataset, the procedure we used to collect the data implies the risk of a non-representative sample. By applying a weight to each data point, we tried to improve on the generalizability of the results.

Second, the financial impact of career breaks extends well beyond effects on remuneration in subsequent employment. There is the income loss incurred during the interruption, as well as the probability of a post-break unemployment spell, or the break stretching into permanent inactivity. Since our dataset was restricted to employees who were working in April 2006, we opted to limit our assessment of the financial repercussions of career breaks to their impact on non-zero wages, i.e. conditional on the interruption being followed by a period of wage employment. However, in order to calculate the full financial implication of a career break, future research might look into the income loss during the break and address our problem of sample selection bias by sampling from the general population (i.e. not only active employees).

Third, post-break career advancement and wage progression may be related to pre-break behavior and treatment. Employees anticipating a career break could be inclined to work in industries (e.g. the public sector) where the wage penalty is thought to be less severe (Nielsen et al., 2004). Anticipating on the wage penalty itself, they may opt for jobs with high initial pay but little wage growth (Gupta & Smith, 2002). Prospects of future interruptions may also lower incentives for on-the-job training, both for the employee and the employer, since the pay-back period will be shorter (Corcoran et al., 1983). In short, individuals who anticipate or plan a career break may select or be assigned to jobs with less potential for training, career and wage progression. Hence, part of the

wage penalty might be attributable to self-selection effects. However, we tried to alleviate this problem as much as possible by including a great deal of control variables in the model.

Fourth, we only took the career break type and duration into account. However, there are many other aspects to career breaks that may influence their wage impact. For instance, career interruptions can be voluntary or involuntary. They can be anticipated, planned for or occur unexpectedly. The break can be full-time or consist of a partial reduction of working hours. The pre-break employment contract can be terminated or merely suspended, allowing the breakers to return to their job after an agreed-upon period of time. Other parameters are the career stage in which the interruption took place and the amount of time since the break ended. Our data did not provide clues on voluntariness, planning, the number of breaks, nor their timing. Future research might want to examine the impact of (several of) these aspects, together with the effect of break type and duration.

Fifth, as mentioned above, we only looked into one specific effect of career breaks, namely their impact on wages in subsequent employment. Apart from the wage impact, there are many other consequences one could consider, both financial and non-financial. In most cases, a career interruption also produces a direct financial loss during the break, in the form of foregone wages. Further, the career breaker might miss out on employer-organized training and career progression that may have been obtained by staying. Moreover, career breaks, at least those of predetermined duration, can be followed by either another inactivity spell or some professional activity. A new term of professional *in*activity can be of the same type (e.g. a young mother prolonging her maternity leave) or be made under an alternative arrangement (e.g. a young father opting to be a homemaker after his parental leave expires). In some cases, a career break is a prelude to a permanent labor market retreat, as in the example of a late-career sabbatical flowing into early retirement. Finally, the career break may have psychological effects. Persons on a break may rearrange their priorities, lose their career commitment or adjust to a slower pace making it hard to rejoin the labor market. Other workers may come out of a career break rejuvenated, ready to pursue old, new or revised career goals with a vengeance. In the latter case, the career break might have a positive effect on the individual's subjective career success (i.e. career satisfaction), which may be considered more important than a decrease in objective career success (i.e. wage). It seems particularly interesting for future research to address some of these other (non-financial) implications of career breaks.

References

Albrecht, J., Edin, P., Sundström, M., & Vroman, S. 1999. Career interruptions and subsequent earnings: a reexamination using Swedish data. *Journal of Human Resources*, 1999, 34(2): 294-311.

Arun, S., Arun, T., & Borooah, V. 2004. The effect of career breaks on the working lives of women. *Feminist Economics*, 10(1): 65-84.

Baum, C. 2002. The effect of work interruptions on women's wages. *Labour*, 16(1): 1-36.

Becker, G. 1964. *Human Capital*. New York: National Bureau of Economic Research.

Blau, F., & Ferber, M. 1990. Career plans and expectations of young women and men. The earnings gap and labor force participation. *Journal of Human Resources*, 26(4): 581-607.

Blundell, R., Dearden, L., Goodman, A., & Reed, H. 1997. *Higher education, employment and earnings in Britain.* London: Institute for Fiscal Studies.

Bruce, D., & Schuetze, H. 2004. The labor market consequences of experience in self-employment. *Labour Economics*, 11: 575-598.

Corcoran, M., & Duncan, G. 1979. Work history, labor force attachment and earning differences between the sexes. *Journal of Human Resources*, 14(1): 3-20.

Corcoran, M., Duncan, G., & Ponza, M. 1983. A longitudinal analysis of white women's wages. *Journal of Human Resources*, 18(4): 497-520.

Douglas, E., & Shepherd, D. 2000. Entrepreneurship as a utility maximizing response. *Journal of Business Venturing*, 15(3): 231-251.

Edin, P., Nynobb, J. 1992. *Gender wage differentials and interrupted work careers: Swedish evidence*. Department of Economics Uppsala University: Working paper nr. 17.

Egerton, M. 2000. Pay differentials between early and mature graduate men: the role of state employment. *Journal of Education and Work*, 13(3): 289-305.

Egerton, M., & Parry, G. 2001. Lifelong debt: rates of return to mature study. *Higher Education Quarterly*, 55(1): 4-27.

Evans, D., & Leighton, L. 1989. Some empirical aspects of entrepreneurship. *American Economic Review*, 78(3): 518-535.

Gould, A. 2004. 'Good luck and you'll be welcome back': manual workers and study leave in Sweden. *Studies in the Education of Adults*, 36(1): 25-39.

Gregory, M. & Jukes, R. 2001. Unemployment and subsequent earnings: estimating scarring among British men 1984-1994. *Economic Journal*, 111(475): F607-F625.

Griffin, C. 2006. Research and policy in lifelong learning. *International Journal of Lifelong Education*, 25(6): 561-574.

Gronau, R. 1988. Sex-related wage differentials and women's interrupted labor careers - the chicken or the egg. *Journal of Labor Economics*, 6(3): 277-301.

Gullason, E. 1991. The effect of job tenure on the earnings of women. *Atlantic Economic Journal*, 19(2): 21-30.

Gupta, N., & Smith, N. 2002. Children and career interruptions: the family gap in Denmark. *Economica*, 69: 609-629.

Gustafsson, S. 1981. Male-female lifetime earnings differentials. In G. Eliasson, B. Holmlund, & F. Stafford (Eds.), *Studies in labor market behavior: Sweden and the United States*: 235-268. Stockholm: Industrial Institute for Social and Economic Research.

Hamilton, B. 2000. Does entrepreneurship pay? An empirical analysis of the returns to self-employment. *Journal of Political Economy*, 108(31): 604-631.

Heckman, J. 1979. Sample selection bias as a specification error. *Econometrica*, 47: 153-161.

Heckman, J., & Borjas, G. 1980. Does unemployment cause future unemployment? Definitions, questions and answers from a continuous time model of heterogeneity and state dependence. *Economica*, 47(187): 247-283.

House, W. 1993. Urban self-employment in Kenya: panacea or viable strategy? *World Development*, 21(7): 1205-1223.

Jenkins, A., Vignoles, A., Wolf, A., & Galindo-Rueda, F. 2003. The determinants and labour market effects of lifelong learning. *Applied Economics*, 35: 1711-1721.

Jones, H. 2005. Lifelong learning in the European Union: whither the Lisbon strategy? *European Journal of Education*, 40(3): 247-260.

Ketsche, P., & Branscomb, L. 2003. The long-term costs of career interruptions. *Journal of Healthcare Management*, 48(1): 30-44.

Kunze, A. 2002. *The timing of careers and human capital depreciation*. IAZ Discussion Paper Series Nr. 509.

Li, P., & Currie, D. 1992. Gender differences in work interruptions as unequal effects of marriage and childrearing: findings from a Canadian National Survey. *Journal of Comparative Family Studies*, 23(2): 218-229.

Light, A., & Ureta, M. 1995. Early-career work experience and gender wage differentials. *Journal of Labor Economics*, 13(1): 121-154.

Liu, Z., & Xiao, J. 2006. The accumulation of human capital over time and its impact on salary growth in China. *Education Economics*, 14(2): 155-180.

Milkovich, G. & Newman, J. 1999. *Compensation*. New York: Irwin/McGraw-Hill.

Mincer, J., & Ofek, H. 1982. Interrupted work careers: depreciation and restoration of human capital. *Journal of Human Resources*, 17(1): 3-24.

Mincer, J., & Polachek, S. 1974. Family investments in human capital: earnings of women. *Journal of Political Economy*, 80(2): S76-S108.

Niefert, M. 2006. *The impact of self-employment experience on wages and the risk of unemployment.* Paper Presented at the CEBR Conference on Entrepreneurship, Copenhagen, June 6-7, 2006.

Nielsen, H., Simonsen, M., & Verner, M. 2004. Does the gap in family-friendly policies drive the family gap. *Scandinavian Journal of Economics*, 106(4): 721-744.

Spivey, C. 2005. Time off at what price? The effects of career interruption on earnings. *Industrial and Labor Relations Review*. 59(1): 119-140.

Stafford, F. & Sundström, M. 1996. Time out for childcare: signalling and earnings rebound effects of men and women. *Labour*, 10(3): 609-629.

Steel, J., & Sausman, C. 1997. The contribution of graduates to the economy: rates of return. In National Committee of Inquiry in Higher Education, *Higher education in the learning society*. Report 7. London: NCIHE.

Stratton, L. 1995. The effect interruptions in work experience have on wages. *Southern Economic Journal*, 61: 955-970.

Vignoles, A., Galindo-Rueda, F., & Feinstein, L. 2004. The labour market impact of adult education and training: a cohort analysis. *Scottish Journal of Political Economy*, 51(2): 266-280.

Williams, D. 2000. Consequences of self-employment for women and men in the US. *Labour Economics*, 7: 665-687.

William, D. 2004. Youth self employment: its nature and consequences. *Small Business Economics*, 23: 323-336.

Williams, G., & Kitaev, I. 2005. Overview of national policy contexts for entrepreneurialism in higher education institutions. *Higher Education Management & Policy*, 17(3): 125-141.