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**The impact of education and labour market experience on earnings :  
what differences between men and women?<sup>1</sup>**

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**Introduction:**

1. The recent years have witnessed an increase of women's educational level and participation to the labour market. In such a context a natural question is to compare this favourable evolution to the one of wage inequalities between men and women. After mentioning that, from a general point of view, wage differences still exist for « equal jobs », we make a synthesis of the recent French studies dealing with the differences between men and women in the wage premium associated with the several forms of human capital : education, and professional experience. These studies show that, with a same level of education, women get lower earnings, in particular because they less often reach high-paid jobs or high-paying firms. In the same way, experience premium appears lower for women than for men.

2. The recent years have witnessed an increase in women's educational attainment and qualification level. More and more young girls obtain the « <sup>3</sup> (44 percent of the girls born in 1970, against 28 percent of the girls born in 1950<sup>4</sup>), go to university or attend post-graduate classes. The proportion of women exercising qualified jobs of managers, senior professionals, or associate professionals (« cadres » and « professions intermédiaires »), has also increased : 30 percent in 1990 against 24 percent in 1982<sup>5</sup>.

3. We can wonder whether this relative improvement in female situation on the labour market was accompanied by a reduction of gender wage inequalities. Of course, if we look at the average earnings, the differences between men and women decreased, due to the rise of female qualification level. The ratio of the average net earnings of women working full-time

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<sup>1</sup> this contribution is based on Colin C., « La valorisation de l'éducation et de l'expérience professionnelle à travers le salaire : quelles différences entre hommes et femmes ? *Les cahiers du MAGE* 2/97, p. 21-34.

<sup>2</sup> the views mentioned here are not the INSEE's position and commit only the author.

<sup>3</sup> second level education, second stage (upper secondary diploma).

<sup>4</sup> *Les femmes*, Contours et caractères, Service du Droit des Femmes et INSEE, 1995.

<sup>5</sup> Marchand O., « Les emplois féminins restent très concentrés », 1993.

relative to those of men increased from 66.7 percent in 1970 to 76.6 percent in 1994<sup>6</sup>. But the gap remains high, because, despite the increase of their average qualification, women are still concentrated into a narrow range of jobs, of clerks, services and sales workers for the main part, which are not very well paid. In such a context where the structure of female labour force is very different from the structure of male labour force, the comparison of the average earnings does not have much sense. The question of pay differences for equal jobs is more relevant. In a first section we focus on this subject, and see that measuring these differences is a difficult exercise, not always satisfactory. Let us say already that the recent French statistical studies estimate the pay differential for « equal jobs » between 11 and 14 percent of female earnings.

4. A complementary approach, perhaps more satisfactory, consists in studying the differences between men and women in education wage premium and experience wage premium. We consider them in the second and third sections. Whatever the statistical specification chosen, the empirical studies we review notably show that men take more advantage of their human capital than women. For instance, with a same diploma, men get to higher (and higher paid) jobs than women, and work in firms which offer higher wages. For this reason, the estimated education premium always appears lower for women than for men. But if we control for this selection effect, the specific effect of diploma on earnings does not seem very different for men and women. In the same way, the real professional experience premium is higher for men than for women. This premium is lower if the career was interrupted, particularly in the case of women.

**The analysis of wage differences for equal jobs between men and women : a difficult exercise, partly satisfactory.**

5. The comparison between average male and female earnings alone is not sufficient to appreciate the female situation as far as earnings are concerned, because the average female qualification is lower than the male one, despite its increase in the recent years : 60 percent of the female wage-earners, against 49 of the male ones, belong to the least qualified occupational categories : clerks and sales workers, manual workers (craft and related trades workers, operators and elementary occupations<sup>7</sup>).

6. Measuring wage-discrimination then requires an evaluation of the male/female wage differential « for equal jobs ». To do this, the statistical method consists in explaining earnings by gender and the highest possible number of relevant explanatory variables (covariates), such as occupation, professional experience, education, type of contract, and so on, in order to define the most comparable jobs as possible, and to measure the specific effect of gender on earnings at best.

7. This kind of empirical research was carried out several times on French data, in particular on the basis of the Structure of Earnings Surveys or the Education and Professional Qualification Surveys carried out by the INSEE<sup>8</sup> (see for instance Lhéritier (1992) from the 1986 Structure of Earnings Survey, or Bayet (1996b) or Colin (1995) from the 1992 Structure of Earnings Survey). The male/female wage differential not explained by occupation,

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<sup>6</sup> Bayet A. et Julhès M., *Séries longues sur les salaires*, Insee-Résultats n°457, 1996.

<sup>7</sup> these data were calculated on the basis of the French occupational classification, the PCS (nomenclature des Professions et Catégories Socioprofessionnelles). The same results established with the ISCO, international standard classification of occupations, could be quite different, in particular because some middle-managers can be classified with the craft and related trades workers (for figures about employment according to the ISCO classification, see for instance Eurostat (1995)).

<sup>8</sup> French National Statistical Institute.

professional experience (age and seniority), economic activity, size and location of the firm of employment, and, depending on the estimated models, nationality, or working hours, is then estimated between 11 and 14 percent of the female earnings. Even if we compare a man and a woman who have the same job in the sense of the most detailed level of the occupational classification (the PCS (Professions et Catégories Socioprofessionnelles) classification, with 455 items), this gap still exists.

8. However such estimations are not perfect. First we note that observed individual (and job) characteristics always explain male earnings better than female earnings, which suggests that other (unobserved) characteristics influence female earnings. Moreover, women's interruptions in working life are rarely taken into account (this point is detailed in the third section). Endly, only quantifiable variables exogenous to the labour market can be used in such estimations, as Silvera (1996) mentioned. She introduces other explanations of the gender wage differential, of institutional, sociological, or cultural kind, which are a little far from our statistical approach.

9. From another point of view, female jobs and male jobs are often so different that the comparison of earnings for « equal jobs » is somewhat artificial. A lot of occupations are male-dominated, or female-dominated, that is held either mostly by men (managers, senior professionals, technicians, manual workers), either mostly by women (clerks, sales and services workers, health and social work associate professionals, see Colin (1995)). That is one reason why law uses the notion of work of equal value instead of equal job<sup>9</sup>, but unfortunately the value of a job cannot be observed in a statistical survey.

10. Because of the problems raised by such comparisons, another point of view can be to compare the impact of the most important determinants of earnings for men on the one hand, for women on the other hand. We will specifically focus on education and professional experience, to see how men and women take advantage of them differently.

### **The wage premium associated to education**

#### *Education, first component of human capital*

11. A first way to look at the link, according to gender, between skills or qualification and earnings, consists in comparing the impact of education on earnings (the education premium) between men and women. Education is the first component of « human capital », the theory of which was introduced by Becker (1964). According to this theory, wage depends on individual productivity, which increases with the investments in human capital, made initially (educational investment) as well as all along the career (professional experience). Education can be measured either by the highest achieved diploma, or by the number of years of schooling. Both measures have imperfections : someone can have a higher educational level than his (or her) highest obtained diploma ; on the other hand, the number of years of schooling gives an imperfect image of the level attained, insofar as some years may have been repeated.

#### *An education wage premium lower for women...*

12. Several empirical studies on French data have dealt with the question of the compared premium of formal education between men and women, this premium being measured as the percentage of additional wage brought by a given diploma, or by an additional year of schooling, in comparison with a reference situation. In most cases they conclude that the

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<sup>9</sup> article L140-2 du Code du Travail : « Tout employeur est tenu d'assurer, pour un même travail ou pour un travail de valeur égale, l'égalité de rémunération entre les hommes et les femmes

education premium is lower for women than for men, for the majority of diplomas or educational courses.

13. Most of the time those studies use wage equations estimated only on the population of the women who actually work. This generates a selection bias because a number of women do not participate to the labour market, the economic argument for this non-participation being that, for these women, the earnings that are offered to them on the labour market are lower than their « reservation wage », above which they accept to work. However, the study of Glaude and Lhéritier (1995), which takes into account this selection bias, has shown that the estimated coefficients were not significantly modified.

14. So, the crude comparison of diploma premia for individuals who had continuous careers<sup>10</sup> (Bayet (1996a)) shows a lower premium for women than for men (see table 1). For instance, having the « baccalauréat » (upper secondary general diploma) leads to earnings 45 percent higher than the earnings of those who have a BEP<sup>11</sup> or a CAP<sup>12</sup> (elementary vocational training) in the case of men, and only 27 percent in the case of women. The gap is particularly big for post-graduated. However the DEUG<sup>13</sup> (university initial degree) and health and paramedical diplomas give a higher premium to women than to men : having a DEUG leads to earnings 56 percent higher than the earnings of those who have a BEP or CAP for women, 49 percent for men.

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<sup>10</sup> the results on individuals who experienced significant career breaks go into the same direction.

<sup>11</sup> Brevet d'Etudes Professionnelles

<sup>12</sup> Certificat d'Aptitude Professionnelle

<sup>13</sup> Diplôme d'Etudes Universitaires Générales

**Table 1 : effect of diploma on earnings for individuals with a continuous career, in 1992  
(translation of a table published in Bayet (1996a))**

in %

| Diploma   | Men       | Women |
|---|-----------|-------|
| Université 2è ou 3è cycle<br>(University, second degree or post graduate)                           | 107       | 80    |
| Grande école (High school)  | 141       | 113   |
| DUT, BTS (Diplôme Universitaire technique, Brevet de Technicien Supérieur, technical higher degree) | 59        | 43    |
| Paramédical - santé (paramedical, health diploma)   | 31        | 46    |
| DEUG (Diplôme d'Etudes Universitaires Général, university initial degree diploma)                   | 49        | 56    |
| Baccalauréat (general upper secondary diploma)  | <b>45</b> | 27    |
| Bac professionnel ou technique (technical upper secondary diploma)                                  | 25        | 16    |
| BEPC (general lower secondary diploma)  | 10        | 7     |
| BEP - CAP (technical lower secondary diploma)   | Ref.      | Ref.  |
| CEP (primary diploma)   | -9        | -18   |
| Without diploma   | -12       | -18   |

*Source : 1992 Structure of Earnings Survey, Insee*

Explanatory note : ceteris paribus (that is experience, seniority, economic activity, size and location of the firm of employment being equal), having the baccalauréat (general upper secondary diploma) leads- for a man- to earnings 45 percent higher than the ones of a man who has the BEP (Brevet d'Etudes Primaires, technical lower secondary diploma), but the same other characteristics.

15. A first analysis of the last Structure of Earnings Survey carried out by the INSEE in 1995 reveals effects of the same kind, that is a lower education premium for women, but with equality for the level « baccalauréat » + two years. However, if we look at the education premium by age groups, we observe that the premium decreases as it concerns younger generations (see table 2). In such conditions, the bias due to the fact that women are more recent graduates than men should have less influence in the future, and the global differences in

education premium between men and women should decrease. Moreover, we observe some few cases for which the education premium is higher for women than for men, especially for people aged 45-55, and, for the highest levels of education, for people aged 34-45. One interpretation could be that men would have progressed up the hierarchy of jobs more often than women, with a same diploma (internal promotions, for instance some technicians may have reached managers jobs, or some manual workers may have reached technicians jobs). Thus the effect of education on earnings would remain high for women, the correspondent effect being observed for men through the impact of occupation on earnings.

**Table 2 : specific effect of educational level on earnings, in 1994, by age groups**

in %

| Educational level  | Men          |               |               |               |              | Women        |               |               |               |              |
|--|--------------|---------------|---------------|---------------|--------------|--------------|---------------|---------------|---------------|--------------|
|  | aged<br>= 25 | aged<br>25-35 | aged<br>35-45 | aged<br>45-55 | aged<br>> 55 | aged<br>= 25 | aged<br>25-35 | aged<br>35-45 | aged<br>45-55 | aged<br>> 55 |
| CEP, BEPC (general primary and lower secondary)  | REF          | REF           | REF           | REF           | REF          | REF          | REF           | REF           | REF           | REF          |
| CAP, BEP (technical lower secondary)   | ns           | 10            | ns            | ns            | ns           | ns           | ns            | 11            | 13            | ns           |
| baccalauréat général (general upper secondary)   | ns           | <b>31</b>     | 16            | 22            | ns           | ns           | 14            | 17            | 33            | ns           |
| baccalauréat technique ou professionnel (technical or vocational upper secondary)      | 14           | 20            | 17            | 29            | ns           | ns           | 14            | 13            | 26            | ns           |
| baccalauréat + 2 ans (baccalauréat + 2 years : DUT, BTS, DEUG)                         | ns           | 32            | 23            | 41            | ns           | ns           | 24            | 32            | 56            | ns           |
| baccalauréat + 3 ans (baccalauréat + 3 years : licence)                                | ns           | 37            | 36            | 49            | ns           | ns           | 25            | 33            | 37            | ns           |
| baccalauréat + 4 ans (baccalauréat + 4 years : maîtrise)                               | ns           | 45            | 36            | 62            | ns           | ns           | 29            | 40            | 87            | ns           |
| baccalauréat + 5 ans (baccalauréat + 5 years : 3ème cycle universitaire, grande école) | ns           | 50            | 50            | 90            | ns           | ns           | 62            | 68            | 91            | ns           |

Source : DADS additional survey, 1994, INSEE

Explanatory note : ceteris paribus, that is occupation, age, within-the-firm seniority, economic activity, size and location of the firm of employment being equal, a man who is between 25 and 35 years old and who has a general baccalauréat level earns 31 percent more than a man who is between 25 and 35 years old and who has a general primary and lower secondary level.

ns : non significant (the concerned educational level does not lead to earnings significantly higher than the ones of individuals who have the reference level : general primary and lower secondary level).

Note : earnings of people aged less than 25 years or more than 55 years are not very well explained, in particular because of the small number of observations.

16. In a different way, Simonnet (1996) paid attention to the wage premium associated to a year of schooling, for each level of education, and noticed that education premia were different for men and women ; for the majority of educational courses, the average year-of-schooling premium is lower for women than for men, with the exception of the courses leading to a

diploma in the group of the BTS<sup>14</sup> (upper secondary technical diploma). But when she takes mobility into consideration, she shows a tendency to the equalization of education premia between men and women, and she concludes that if they choose the same career, then men and women get the same wage for a same level of education. But men and women rarely « choose » the same career.

*... but a selection of men towards higher-paid jobs*

17. In fact, the main explanation for the differences in education premium between men and women is the fact that, with a same diploma, first men go more often into firms which pay their employees better<sup>15</sup>, and second men take more advantage of their diploma by getting more often than women to high positions. The estimations in Bayet (1996b) with many explanatory variables show that, *for a given occupational group*, the diploma premium is not very different between both genders.

18. The figures concerning the structure of employment confirm this selection effect. The proportion of women having an executive job is much lower than for men : 0.8 percent<sup>16</sup> of women are executive in public administration, against 1.7 percent of men, 2.3 percent of women are administrative or sales executives against 4.4 percent of men, and 0.8 percent of women are engineers or technical executives against 4.4 percent of men. As for getting to the job of manager of a firm with 10 employees or more, this concerns only 0.2 percent of women, against 0.8 percent of men.

19. Concomitantly, female employment is much more concentrated than male employment. 28 percent of female jobs are concentrated in education, health and social work, a long way ahead of public administration, which concentrates « only » 12 % of women, and 17 percent of female jobs are office clerks jobs. As for men, concentration is much less pronounced, since the economic activity employing the greater proportion of men, wholesale and retail trade, employs only 13 percent of men, hardly more than public administration (12 percent), real estate, renting, and business activities, or construction (11 percent). The occupational groups where male employment is most concentrated, the ones of skilled craft workers, and skilled operators and assemblers, represent only 10.5 and 10 percent of male labour force.

20. Endly, one can remark that the economic activities most female-dominated, that are health and social care, production of textiles and leather products, offer in average respectively only 80 percent and 73 percent of the average earnings, while the most male-dominated economic activities, construction and transports, offer in average 90 and 87 percent of the average earnings. So the economic activities where the labour-force is strongly male- or female-dominated offer relatively low wages, even lower in the case of female-dominated economic activities than in the case of male-dominated ones.

### **The impact of professional experience on earnings**

*Professional experience, a many-faceted component of human capital*

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<sup>14</sup> Brevet de Technicien Supérieur

<sup>15</sup> furthermore the comparison between a model without specific firm effect and a model with specific firm effect shows that the education premium is lower within a given firm than in general, so the diploma is also a key to enter the firms which offer higher wages to their employees. This is true for men as well as for women.

<sup>16</sup> figures from the 1994 Labour Force Survey (calculated on the basis of the PCS classification).

21. Comparing the experience premium between men and women is a little more delicate than for the education premium. Professional experience represents the second component of human capital, but its real measure is not easy : it should not take into account the periods where the career has been interrupted, for several reasons (unemployment, parental leave, sabbatical year, and so on). But the information on career breaks is rarely available in the surveys because one needs to reconstruct all the personal and professional history to get it. In the measure of professional experience, a distinction is also made between the general professional experience, that one can transfer from one job to another or from one firm to another, and the specific professional experience, that one cannot transfer. We usually measure the first one by the total number of years on the labour market, and the second one by the seniority within the firm.

22. Thus the analysis of experience premium and its differences between men and women has several dimensions : general experience (impact of age on earnings), specific experience (impact of seniority), mobility (impact of the changes of job within the firm or outside), but also experience achieved outside the labour market (effect of career breaks). We will see these various aspects successively.

*An experience premium different for men and women...*

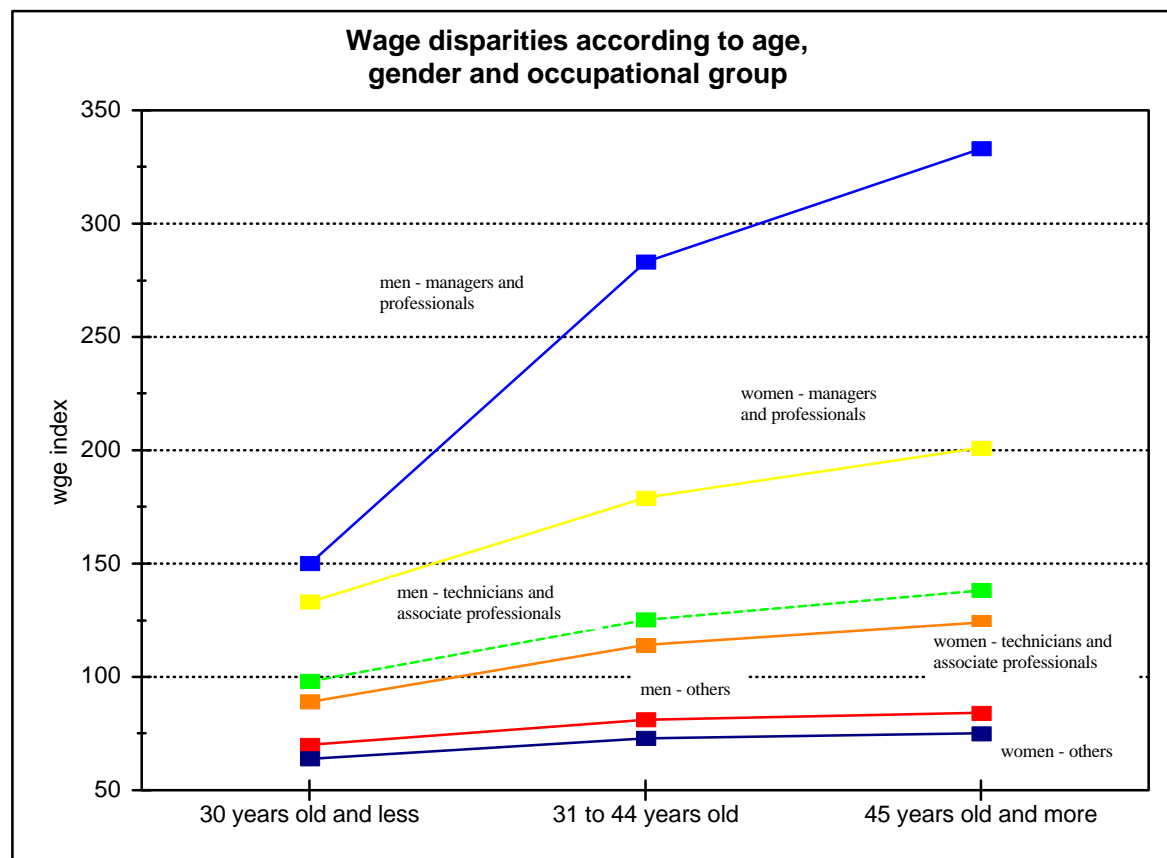
*concerning general professional experience...*

23. Empirical studies on French data have shown an increase in earnings<sup>17</sup> with age or professional experience sharper for men than women, *ceteris paribus*. For instance, wage disparities according to age are greater for men than for women (Colin (1995)). However these estimations made on cross sections do not separate the generational effect (the qualification gap between men and women is smaller for the younger than for the older generations) from a lower progression of women during their earnings career.

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<sup>17</sup> total earnings, all bonuses included.

**Graph 1 : wage disparities according to age, gender and occupational group (graph taken from Colin (1995))**



Source : 1992 Structure of Earnings Survey, INSEE

Base 100 : average earnings (FF 141 400).

Explanatory note : for women of the group « clerks- services and sales workers- manual workers » (women-others), the earnings of the « 45 years old and more » are on average 17 percent higher than the ones of the « 30 years old and less » (the wage index increases from 64 to 75).

Note : the apparent progression of earnings with age is not only due to a career effect. People aged 30 years and less and people aged 45 years and more belong to different generations, and the average earnings of people aged 30 years and less can then evolve in a different way from the older generations.

24. More precisely, Sofer (1990) and Glaude and Lhéritier (1995) found an impact of real professional experience (that is excluding the periods outside the labour market) lower for women than for men (around 2.3 percent per year for women against 3.1 percent for men in both studies).

25. Career breaks were also taken into consideration in Bayet (1996a), thanks to the data of the 1992 Structure of Earnings Survey. This led to make separate estimations on the individuals who had a continuous career on the one hand, on the individuals who had discontinuous careers on the other hand.

26. Two interesting conclusions with regard to earnings comparisons between men and women were shown in this way. Strictly on professional experience premium, the general or specific experience premium is found to be lowered for the individuals who experienced career breaks in comparison with the ones who did not : each additional year of general experience

leads to earnings 4.3 percent higher for the men who had an unbroken career, to earnings 1.6 percent higher for the ones who experienced significant career breaks. As for women, these premia were found to be respectively 3.7 percent and 1 percent. For each year of specific-to-the-firm experience, the premium is 4.7 percent for the men with an unbroken career, against 3.8 percent for the ones who had an incomplete career, and 4.2 percent for the women with an unbroken career, against 3.3 percent for the ones with an incomplete career.

27. The decrease in experience premium observed for the individuals who had incomplete careers (in comparison with the ones who had continuous careers) is higher for women, who also experience the longest career breaks. Thus when the impact of human capital on earnings is estimated on a heterogeneous population mixing people with continuous careers and people with incomplete ones, a downward bias is generated on the experience premium. The differences in experience premium, *ceteris paribus*, between men and women or between unskilled and skilled jobs are then overestimated, when career breaks are not taken into account.

28. On the other hand, Bayet (1996a) also found that when he restricts himself to comparable populations with unbroken careers, the wage differential between men and women lightens in comparison with usual estimations. This suggests that part of the discrimination usually found can be explained by heterogeneity concerning career breaks.

*... as well as experience achieved outside the labour market...*

29. The direct impact of career breaks on earnings could also be measured for the groups who experience the longest interruptions, that are manual workers for men and clerks and sales workers for women. According to Bayet (1996a), the comparison of the results between these two groups shows that a career break has a positive impact on earnings levels for women who have clerks and sales workers jobs, but a negative one for men who have manual workers jobs, as if a career break was regarded as natural for a woman, perhaps even enriching insofar as it could allow her to develop some skills, non strictly professional but that can be used at work. On the contrary, long career breaks would be interpreted as negative signals for men and entail an earnings penalty.

30. Sofer (1990) also provided some evidence of a positive effect on earnings of the years spent outside the labour market for women, for a given professional experience. Such an effect does not appear for men.

31. On the contrary, Glaude and Lhéritier (1995) found an earnings penalty due to past unemployment, but lower for women than for men (each year of unemployment leads to earnings 4.6 percent lower for women, 6.5 percent lower for men), and an earnings penalty due to the years of inactivity. These results are not necessarily contradictory with the preceding ones insofar as, on the one hand, the study of Bayet (1996a) only takes the breaks longer than two years into consideration, and on the other hand, it cumulates the breaks. In fact the impact of career breaks may depend on their reason.

*... as well as mobility...*

32. The effect of mobility is also different for men and for women. That is one of the conclusions of Simonnet (1996) found on the first years of the professional career. She found that internal mobility (changes of jobs within the same firm) has a positive impact on earnings for men, whereas an internal mobility too high leads to an earnings penalty for women. On the contrary, a high external mobility has positive effects for women, but negative ones for men.

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<sup>18</sup> estimation carried out on individuals with unbroken careers (Bayet (1996a)).

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