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Do women fit in?

- The future IT labour market

Christina J. Colclough and Elisabeth Michielsens

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Employment Relations
Research Centre
Department of Sociology
University of Copenhagen

Forskningscenter for
Arbejdsmarkeds - og
Organisationsstudier
Sociologisk Institut
Københavns Universitet

Øster Farimagsgade 5
DK – 1014 Copenhagen K
Tel: +45 35323299
Fax: +45 35323940
faos@sociology.ku.dk
www.faos.dk

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Introduction

At a time when female participation in European labour markets is rising, their integration is a critical political issue and the nature of employment is undergoing significant change. This paper focuses on the position of women in terms of access and promotion in the IT services[1] labour markets of Denmark, Britain and Italy.

It is based on part of the findings of a two-year EU-funded comparative research, which has sought to examine the nature and extent of gender and ethnic minority participation at sectoral level by investigating the structural obstacles to inclusion in terms of access, retention and promotion and the policies that may be effective in overcoming these. Next to IT, two other strongly male (and white) dominated sectors (Construction and Print) and one female (and ethnic) dominated sector (Health) were examined in Britain, Denmark, Germany, Italy, the Netherlands and Spain. The practical work conducted included a literature and statistical review as well as interviews at European level and national macro- (with social partners and training organizations) and firm level in-depth interviews (with HR managers/owners of firms) in each sector and in each country. The variables taken into account focused on the demand side rather the supply side. Structural mechanisms such as the education and training, wage structures, employment and working conditions, practices and policies regarding recruitment, equal opportunities and family friendly benefits, and the impact of Active Labour Market policies were examined in each of the sectors and countries for both women and ethnic minorities. This paper will only focus on the gender related findings in the IT sector of three countries from the research.

Sectoral trends

From 1995 to 2000 employment in ICT service grew by 11% a year, whilst employment in the IT hardware and manufacturing sectors declined (OECD 2003). However after this period of rapid growth in economic output and employment and a vast expansion of services and integration into almost all other sectors in the labour market, the European IT sector in general has over the last two to three years experienced a downturn in the speed of development, turnover and employment. In this paper we focus exclusively on the characteristics, gender composition, employment profiles and development of the IT service sector[2] in three European countries: Britain, Denmark and Italy.

The recent downturn in IT service employment and turnover has not occurred at the same pace and to the same extent in the three countries. In Britain employment figures had already started to decrease in 2001, in Denmark the downturn was not evident before the second half of 2002, and in Italy despite a slowdown in job creation, employment figures were still rising throughout 2002. Since the boom in the American IT sector had happened earlier than in Europe, many large American companies entered the European market in the early days of rapid expansion. The European IT market and European companies have

[1] We focus on the IT service industry, not manufacturing industry. Overall IT services are less 'integrated' in terms of gender than manufacturing, which is why we choose to focus on the former.

therefore been greatly influenced by American corporate culture: trade unionism and collective bargaining in most countries and firms is explicitly not supported and the negotiation of employee rights and corporate values is decentralised to the level of the firm and individual. American-born concepts such as Human Resource Management, corporate social responsibility and diversity management also play an important role in the management of the larger IT firms. The vast majority of firms that were established by Europeans during the same period were, on the contrary, micro-sized companies that often either employed just one person or a maximum of five. Hence the IT sector in Britain, Denmark and Italy is characterised by a polarisation of firms between many micro-sized firms and a few large firms that employ the majority of the employees. The divide between large and often multinational companies, on the one hand, and small micro-sized national companies on the other is significant with regard to actual working and employment conditions in firms. Where the larger firms have more often than not introduced American-style employee policies, the smaller and less resourceful companies have adopted them to a much lesser extent: in the vast majority of small companies in all countries formal equal opportunity policies, firm-embedded social benefits, diversity management policies and human resource management initiatives are not applied. However the degree of decentralisation and individuality within the small companies is just as significant as within the larger ones. The internal organisation of the companies is often characterised by a flat structure where employees share responsibilities and relatively autonomous teams substitute the more traditional hierarchical structures.

In addition to its characteristics of decentralisation, non-unionisation and horizontal organisation, innovation and development in the IT sector is technology driven and highly dependent on the employees' human and social capital - when understood as formal and informal competencies, social skills and learning processes. However as we will show in the following, different groups in society have unequal access to optimising their capital, which in turn can lead to polarisation within the sector. As Castells already in 1996 argued "there is [in the information society] an expansion of information-rich occupations .... as well as a growth of low-end, unskilled service occupations leading to advanced information societies characterised by an increasingly polarised social structure, where the top and the bottom increase their share at the expense of the middle'. As this paper will show, education and training as well as other socially-embedded competencies play a decisive role in the labour market opportunities and attainment of different groups of employees within the sector.

Women in the IT sector - the degree of segregation

The most recent comparable data from 2001 shows that throughout Europe the presence of women in the IT services sector is lower than in the overall labour market. However there are significant differences in the degree of female integration in IT between the three countries. In Britain and Denmark the share of women employed in IT is so low we can define the IT services sector as distinctly male-dominated: in Britain women's overall labour market share is 45%, in the IT sector however only 24%. In Denmark it is 47% overall; in the IT sec-

tor only 26% of employed are women however. In Italy women's share in the overall labour market is 38%, in the IT sector it is 30%. The IT sector in Italy can on the basis of these figures be termed as integrated, whilst it is significantly gender segregated in both Denmark and Britain. (National Labour Force Surveys Denmark, UK and Italy 2001 - own calculations; EU 2002)

The countries have different female employment rates: Denmark has the highest female employment rate in Europe with 72% (compared to 80% for men), for Italy this is 41% (men: 68%); and in Britain it is 65% (men: 78%) in 2001. What this shows is that in the country with the lowest female employment rate, Italy, the degree of gender segregation is lowest. Tentatively we can argue that in the country where female employment in the labour market is relatively new and therefore still growing, possible barriers to employment in otherwise typical male sectors might be of a lesser character than in countries where female employment in the labour market has been at a high level for a longer period of time. Research has also shown that the higher the female employment rate the stronger the degree of labour market segregation (Jacobs 1999).

However, what these sector-level figures do not reveal is in what occupations and at what hierarchical levels women are employed compared with men. All countries report of a relative absence of female middle-level and/or top-level managers in the sector, and to varying degrees a relative absence of women in highly technological occupations such as programme developers and system designers. The difference in occupational status reflects the so-called 'job function segregation' in which segregation occurs first and foremost at a horizontal level and along functional rather than occupational lines. This is reflected in our research finding that women are more often than men employed in service positions, i.e. customer care, project management, creative design and personnel functions. This intra-sectoral functional segregation plays an important role in wage-setting procedures and promotion chances as we will see later in the paper.

Educational attainment in Italy, Denmark and Britain

The downturn in the market has had an impact on the importance of formal qualifications as a prerequisite to employment in the sector. For instance, in Britain (with employment decreasing more than in other countries) formal qualifications are used to make the first selection from the large pool of candidates. Also in Italy and Denmark formal - and especially here university qualifications - have now become a necessity for entry to the sector.

In the period of vast expansion in the sector the supply of labour by no means met the demand, leading many employers to employ staff with no or little experience. However with increasing unemployment amongst both experienced as well as trained persons, the pool of available and suitable staff has grown, why the recruitment and training of people without IT skills no longer occurs in all three countries. Given these tendencies we will be able to estimate the future gender profile of the sector, by looking at the proportion of women and men in the different IT educations.

As mentioned above, access to the sector in Denmark is strongly linked to the applicants' formal qualifications. If we therefore look at two different types

of education - datamatikers', which is a short-term further technical education and at 'datalogs', which is a long-term higher scientific education, we can see how the proportion of women in the educations has changed over time.

Table 1: Denmark - Number of students by education, gender and time (Includes weighted percent)

Number of students		1993		1997		2001	
			%		%		%
403940 IT - (Datamatiker)	**Total**	1693		2701		4697	
	Men	1451	86%	2360	87%	3920	83%
	Women	242	14%	341	13%	777	17%
653520 Datalogi-IT	**Total**	133		143		1078	
	Men	112	84%	127	89%	745	69%
	Women	21	16%	16	11%	333	31%

Classification system, DUN. Source: Statistics Denmark 2003

Table 1 shows how the share of students by gender has developed over an 8-year period in Denmark. In general we can see that the two educations are becoming less gender segregated over time. For both educations we can see that the period between 1997 and 2001 is one in which the total number of students sharply increases. If we begin by focusing on the semi-skilled datamatikers, the table shows that the education is slowly becoming less gender segregated. However despite the positive tendencies, the gender divide is still substantial with only 17% of all students being women in 2001. The tendencies are slightly different when we turn to look at the 5-year long datalog university education. Here we can see that 30% of all the students are women in 2001, which is twice as many as in 1993.

Table 2 below shows the number of graduated students by education, gender and time. Again the table shows a strong degree of gender segregation in both types of education. With regards to the datamatiker education, we can see that the sharp increase in students from 1997 onwards has not lead to a sharp increase in the relative number of female students. However if we take the duration of the individual educations into account, we can roughly conclude that women do not have a higher dropout rate than men. The noteworthy increase in the number of female students in the university degree datalogi, can on the basis of these figures, not be compared to actual graduated women, since more recent figures would be required in table 2.

Table 2: Denmark- Number of graduated students, by education, gender and time

		1995		1997		1999		2001	
403940 IT datamatiker	**Total**	450	100%	450	100%	555	100%	1243	100%
	Men	400	89%	414	92%	499	90%	1037	83%
	Women	50	11%	36	8%	56	10%	206	17%
653520 Datalogi-IT	**Total**	17	100%	12	100%	21	100%	86	100%
	Men	13	76%	9	75%	18	86%	69	80%
	Women	4	24%	3	25%	3	14%	17	20%

Table 2: Number of graduated students by education, gender and time. Source: Statistics Denmark 2003.

In Britain the picture is different. Unlike in Denmark, Higher IT Education (university level) is more male dominated than IT education at 'Further Education' level (below university - short and long courses). The share of female students in most IT-relevant higher education is however higher than in Denmark. At Further Education level women form the majority (58% in 2002) of learners on short and long courses in the subject of Information & Communication Technology for instance (LSC 2003). Higher education is seen as the main route into the IT services sector: "Missing out on Higher Education effectively closes the door on any potential career in ICT" (Miller and Petrie 2002). The representation in education of women is therefore important for their access to the sector. Especially IT specific degrees such as Engineering, Technology or Computer Science courses or science degrees such as Mathematics, Physicals Sciences, Combined or and Applied Sciences are seen as ideal to necessary entry requirements to the IT Software sector (IT/Business related degrees less).

Women are generally underrepresented among graduates in the IT related subjects (see Table 3), especially in Engineering and Technology, which in total has greater numbers graduating than Computer Science or Mathematics. The proportion of women in the Britain in these subjects is also lower than in other European countries. The gender imbalance is getting more pronounced, despite initiatives of the government such as Women in Technology (WIT) and WISE (Women into Science and Engineering). The proportion of female computer science graduates declined between 1994 and 1999. Also, higher proportions of men (52%) than women (40%) of computer science graduates were recruited by the business services industry after graduating. (Miller and Jagger 2001)

Table 3: Britain - Qualifications obtained on higher education courses by subject area, 1999/00

Selected Degrees	**% Female**	**Total number of qualifications**
Mathematical sciences	37.6%	5,310
Computer science	25.2%	21,210
Engineering and technology	15.7%	33,210
Law, Business & administrative studies (Including IT/business degrees)	52.3%	82,360

Source: (DTI 2001 - SET website) HESA Student Record July 2000
(Figures supplied have been subjected to HESA standard rounding methodology)

The under representation of women in IT degrees is seen to be linked to choices/actions at stages before higher education. The figures of IT related subjects at secondary level reveal a similar trend as in higher education. Data on performance at secondary school level qualifications shows that girls are under

represented at A level in key subjects, not at GCSE level: more women then men obtained GCE A-levels in 1999, but fewer girls then boys were qualified in subjects such as maths (36%) and computer science (20%) (Miller and Jagger 2002)

From our macro and micro level interviews it becomes apparent that the industry felt "girls were lost to the industry before they were 14" (interview employer) due to a number of early educational and image related reasons.

In Italy, the tendencies are different again as table 4 shows below. In all but one of the different educations, the absolute number of graduates has fallen. Only in the medium-term computing degree has there been an increase in the number of graduates. Here the number of female graduates has risen four-fold, but the relative proportion of female graduates has not changed significantly. In general, whilst mathematics and statistics shows a strong degree of integration, computing is highly male dominated.

Table 4: Italy - number of graduated students by education, length of study, gender and time.

Teritary education A		1998			2001		
	Duration	Men	Women	% women	Men	Women	% women
Mathematics and statistics (ISC 46)	3-5 years	200	204	51%	219	195	47%
	5-6 years	758	1739	70%	817	1575	66%
Computing (ISC 48)	3-5 years	62	20	25%	229	84	27%
	5-6 years	1254	511	29%	956	357	27%

Source: OECD Education Database 2003. ISCED-97 classification system.

In summary the countries where female participation in IT-specific education appears lowest are Denmark and Britain; the highest Italy. This cross-national 'IT education' picture fully matches the cross-national 'IT workforce' picture: female employment in IT is lowest in Denmark and Britain while Italy was defined as 'integrated'. This indicates a very strong link between education and the labour force in IT.

From education to employment

In all three countries we have seen that an increasing amount of women are graduating with an IT relevant degree. We can therefore suspect the overall number of women in the IT labour market to change in the years to come. However the flow from education to employment is not unproblematic for women. In the following we will present and discuss the demand-side practices leading to employment and how these in some circumstances act as barriers to employment for women. We focus on recruitment practices, contract types and wage setting and working hours.

Recruitment

Our research has shown that informal modes of recruitment, such as network and word-of mouth recruitment are very much part of IT recruitment practices to all levels of employment. Informal recruitment is popular amongst IT employers as it is seen as the most 'efficient' method for finding suitable staff that will 'fit in' and for finding people with the correct qualifications. In Italy employers have also stated that personal trust is strategic, and lessens the risks connected to any uncertainty with regards to an applicant's competences and

skills. The social element and ability to 'fit in' are important as recruitment criteria: the 'social' profile and reputation of the applicant was also an important criterion for selection in Denmark. In Britain large and small companies attached importance to acquiring applicants from prestigious universities.

Recruitment via CVs sent spontaneously to the employer is an important recruitment channel: all countries have a high number of CVs sent to them on spec. In Britain and Denmark none or almost none came from female applicants, a factor attributed to a lack of relevant qualifications.

Recruitment procedures vary greatly according to the kind of enterprise and profession: recruitment to smaller companies in Denmark and Britain was more reliant on informal methods than to the larger firms. In the words of one UK employer, 'it is cheap and the cost of employing the wrong person is too great for a small company.' Small firms, with no specialist interviewers and recruiters, are less able to spread recruitment costs in comparison to large firms with specialist personnel staff and economies of scale in recruitment. Costs are not the only issue: In Italy and in Denmark the reasons for informality of recruitment lie with the skills sought, with the fact that the strategic capabilities sought are informal in nature. High-level professionals are therefore recruited on the basis of personal knowledge or according to 'reputation'. As to professionals, small firms collaborate with self-employed experts, whereas the larger enterprises resort to head hunters or 'attract' technicians from the smaller enterprises, often having established contact via participation in joint projects. In the case of middle-level professions personal knowledge is accompanied by local market research through advertising in newspapers. Variations in selection criteria due to firm size have been noted in other research, but not relating to strategic capabilities: personality characteristics - such as honesty and integrity - and interest in the job are given relatively greater importance in small and medium-sized firms. They are often considered as important as ability, aptitude or attainment (Bartram 1995).

The networks that firms build with educational institutions are used as well: In Britain, small and large companies recruit graduates but also university and further education students on work placement for a year. This is seen as a cheap way of having labour but also as a way to recruit permanent qualified workers in the long run: 'sandwich year' students are given financial incentives to come back after they graduate. In Italy the link with education for larger companies is important in recruitment via (unpaid) training placements organised in co-operation with schools or universities, which can evolve into permanent work via special contracts ('Contratti di Formazione e Lavoro').

While our survey confirmed the use of informal networks and contacts in IT recruitment, formal procedures are not non-existent. In fact, advertisements in newspapers and on the internet are used extensively, especially in Denmark and Britain. Danish employers mentioned however that since the recession the number of on-spec applications is very high, making using them an easier and cheaper alternative to (internet) advertisements. In all three countries Internet recruitment is used, especially by the larger multinationals exploiting this medium fully and globally.

In summary, at present it seems evident that employment in the sector depends highly on access to professional and social networks. It is difficult though to conclude that women are excluded from these informal networks. Interviews in Denmark, UK and Italy did however reveal that informal recruitment methods are seen as a way to recruit 'likes', i.e. 'people who fit in', which will evidently give a bias against the recruitment of people who are considered to be 'atypical' in the firm or sector. Some interviewees acknowledged this (Denmark); others argued it had no influence (UK). The existence of strong social networks can also create 'self-exclusion' from the sector as no obvious incentive or role model is present and potential applicants might not want to be an outsider. The broad number of campaigns and websites (especially reported in Britain) that provide 'alternative' social networks for women in IT in order to access and remain in the industry is significant and proves that there is a need for networking and gathering information by groups at the margins of the sector.

Contract types

By far the majority of all contracts offered in the IT sector are permanent full-time contracts. Statistical data on contracts in the sector show certain differences: while permanent contracts are the norm in all countries, men are more likely than women to be employed on permanent contracts. This difference is least pronounced in Britain.

Table 5: Percentage temporary contracts in IT in Denmark, Italy and Britain

	Men	**Women**	**Men**	**Women**
Denmark	3.8	8	7.5	9
Italy	6.7	9.6	6	9.5
Britain	4.9	6.4	5.9	7.5

Sources: Denmark, LFS 2000; UK and Italy, LFS 2001

Our national surveys reveal a number of reasons for the use of temporary contracts: those given by employers focus on cost or as a security (a 'probation period' after which workers accepted will receive a permanent contract). Highly-skilled workers may themselves prefer working on temporary contracts, such as projects, as it gives them flexibility and better career possibilities. Even in the current period of economic slow down, there is a shortage of certain IT skills that guarantees their work. In Italy, for instance, the main reason given for hiring people on atypical contracts for the higher ranks was that 'self-employed' professionals expressly preferred this form of contract, especially in the case of expert technicians, well-known consultants and the like. While more women than men have temporary contracts, there is no evidence however that the group of self-employed professionals are more likely to be women than men. The reason for the higher percentage of women with temporary contracts relative to men is seen to be more related to their relatively recent arrival in the IT labour market and as a consequence of their greater likelihood of having discontinued careers. The minimal level of employment protection in Britain could be a reason for the similar percentages for men and women.

Interestingly, although the majority of contracts are permanent contracts, atypical contracts are becoming increasingly influential in Italy - the country with the highest female participation rate in IT. In the last five years, five million work places were created in Italy; 90% of these are atypical (part-time work is not considered atypical). As ICT is a relatively young sector, with a high share of new entrants, the quota of atypical contracts is well above average. According to a study carried out last year on a sample of 150 ICT firms (Federcomin-Anasin 2002) around 40% of the labour force is employed through atypical contracts with no employment protection. This is particularly an issue for women: the rapid decrease in formal protection in the last 5-10 years via self-employment was actually simultaneous with a remarkable increase in the presence of women. New (mostly female) entrants into the sector are almost completely lacking any formal employment protection. A common form of these atypical contracts is the 'collaborazioni coordinate e continuative' (co.co.co), which combines the duties of a dependent employee with the (lack of) employment protection (no maternity and family law protection) and rights of an independent worker. Co.co.co, together with other forms of self-employment, makes up more than 40% of the labour force in small enterprises. Enterprises resort first to a kind of self-employment relationship and try to stabilise the contract (dependent work) once they are sure about the employee's competence. The 'Contratti di Formazione e Lavoro' (a special kind of work relationship where the employer is to provide the employee with some hours of external training) are also used by large firms in IT because the cost of labour is reduced. In addition these contracts are fixed-term contracts (normally two years) allowing the company to evaluate the employee's performance and act accordingly with regards future employment. In almost the totality of cases, however, they are turned into permanent contracts. Smaller firms tend not to use these contracts but prefer to resort to self-employed specialist collaborators.

In summary, at present women are more often than men employed on temporary or atypical contracts in all three countries. However, with the exception of Italy, the current use of both of these contract types is rather limited. The Italian case can though be a picture of times to come for other countries. Firstly the current female employment rate in the sector in Italy is much higher than in both Britain and Denmark, and indeed in the rest of Europe. Secondly the development of the Italian IT sector happened later than in other European countries, and has therefore still not reached a mature stage. Thirdly employment in the sector is - contrary to the other countries - still rising, albeit at a slower speed than in previous years. By introducing atypical contracts, which in effect remove the financial risks of employing inexperienced staff or staff with a different profile from the majority, the firm can more flexibly use the hire and fire principle at little cost. It is nonetheless noteworthy that the high influx of women to the sector has occurred at the same time as the introduction of such low-risk contract types. One can therefore suspect that many new entrants to the Italian IT sector- both male and female, but especially female - are employed without any employment protection in the case of, amongst others, illness, maternal/parental leave and dismissal.

Wage-setting and working hours

Wage levels in our three countries, and indeed across Europe, are mainly negotiated at the level of the firm. Collective bargaining in the sector is not common even though parts of the Italian IT sector are party to collective agreements. In Denmark there are two sectoral agreements in ICT services that contain protocols governing ICT work. In Britain, collective bargaining within the sector does not exist. Most wage and employment contract negotiation is therefore decentralised and individualised. The exception from this general rule can be found in low-skilled occupations within the sector, such as call-centre operators and receptionists, who can be covered by collective agreements that are negotiated in other sectors.

Detailed information on wages is scarce. Statistical data is partly available for Denmark and Britain, which confirms the higher pay in the sector and the higher than average variable pay arrangements. In Britain the average annual earning in IT services (£40,185 in 2002) is approximately 60% higher than average earnings (New Earnings Survey 2001). The payment-by results3 part is higher than average, while shift and overtime-related pay are much lower than average. This does not mean that working times are standard: above average hours are seen as 'normal' and therefore not specifically remunerated. The survey data from Denmark and Britain establish that scarcity of the skill, the qualification of the applicant, performance (linked to seniority) and work experience are important in establishing the wage in IT.

Data from Danish statistics show that the wage gap is approximately 10% in favour of men. In addition men receive more fringe benefits than women when these are expressed in monetary values. Women on the contrary receive more often then men sickness with pay, which is mainly due to childcare responsibilities. Furthermore, the Danish data show that when all wage variables are calculated (sick days, fringe benefits, hourly wage costs, pension) men on average are more expensive to employ per performed working hour than women (Statistics Denmark 2003).

With regards to working hours, IT is characterised by an image of long working hours in all countries. Our survey shows that most interviewed companies offer 'standard' working conditions in terms of hours (37.5-40 hours) and holiday allowances (25-30 days). Shift work is not common, except for people on product support helpdesks, etc. These standard times do not reflect the time commitment that is asked for. Overtime work is generally expected, especially for IT projects with deadlines when employees are expected to disregard standard working times and be fully committed to meeting the deadline. In Britain and Denmark this is not remunerated separately. Working hours tend to be stressful as well in terms of coping with constant change and innovation. In all countries it is acknowledged that this has a negative influence on the employment of women in the sector.

Working hours

In Italy it was noted that working hours are extremely demanding, all the more so the higher up the hierarchical ladder and that that makes it difficult for women to combine a career with a family. In fact, teamwork and project dead-

lines make Saturday and evening overtime not so unusual and the role of a project leader is hardly compatible with one of family duties. The case of women who voluntarily forsake child-care leave is rather frequent.

In Britain too the IT industry is said to be characterised by standard conditions with sudden bursts of (extremely) long hours when projects need to be finished. None of the interviewees, however, could give information on the real working hours but it was seen as difficult to always achieve a balance between work life and family life because of the culture of long hours. There is, however, some evidence from our research that an increasing number of firms are becoming 'retention' conscious due to the cost associated with losing experienced staff unable to achieve work/life balance. These companies are implementing more flexible work arrangements, though the commitment demanded regarding deadlines, etc. has not decreased. Women tend to work for larger IT companies than for SMEs, one of the reasons for this being their flexible child-care-friendly working arrangements.

In Denmark, several interviewees suggested that working hours had been reduced to resemble the average working week of 371/2 hours. However, most companies agreed that overtime connected with project finalisation or the sudden influx of business is common. One American-owned company directly stated that the normal working week for their employees was not less than 50 hours, but that the wages were set accordingly. A survey conducted by the trade union Prosa estimated that approximately 49% of members worked extra hours in a given month and 10% of those who had worked overtime had worked more than 22 extra hours that month (see www.prosa.dk for further details).

Barriers to entry into employment for female applicants

The previous sections have examined three factors that characterise the conditions for employment into the IT sector. We firstly examined the recruitment processes and found that employment to the sector depends first and foremost on the applicant having the necessary formal qualifications. If this is the case recruitment mainly occurred through social networks. Women were found to be in a less advantageous position with regards to achieving employment. Firstly, women are underrepresented in IT relevant education, which is reflected in the relative number of applications to companies from women with the necessary qualifications. Secondly, women have at a later stage than men entered into IT relevant education, which is reflected in their less-developed networks. Thirdly, trained women who wish to enter the sector are faced with what can be termed 'statistical discrimination'. Since the sector from the start was male-dominated, if not exclusively male, some employers connect hiring a woman with a degree of risk and uncertainty. Are women as qualified as men? Will female employees have relatively many days off work due to family responsibilities? Will a female employee be a financial burden on the company due to the probability that she will take maternity leave in the near future? Does a female employee fit into the rest of the staff? Will the atmosphere at work change? These questions - if not directly then at least indirectly - subject the individual woman to a form of discrimination that solely is based on her gender and the images men have of

female workers. Not only does she in a job interview situation have to 'sell' her own qualifications, skills and competencies, she must above all be able to convince the employer that his (most managers are male) image of a female worker does not necessarily apply to her as an individual. In Denmark we found evidence of statistical discrimination in the recruitment preferences of employers. However we also found evidence to the contrary, where many companies were explicitly looking for women with the necessary qualifications, in order to achieve a better gender balance at the workplace. In Britain some employers4 indirectly stated that they did not necessarily see a positive link between increased female participation in IT relevant education and employment to the sector. As employers see retention of women qualified and working in the sector is problematic, changes to education only will not change the pattern of representation.

From recruitment we moved on to look at the different contract types that are offered in IT. The evidence shows that in the two countries with the lowest female employment rate in the sector (UK and Denmark) the vast majority of employees were employed on full-time permanent contracts. Temporary contracts were used, but evidence suggested that both employers as well as employees in many cases agreed on the conditions inherent in temporary contracts. With regards to contract types, Italy is significantly different from Britain and Denmark. The growing importance of atypical contracts with little or no employment protection or employee rights goes hand in hand with a sharp increase in female employment. Based on our survey material it is difficult to conclusively say that there is a necessary relation between the two. However the reluctance to employ women due to the supposed financial costs related to employing especially younger women might in cases where formal employment protection is high, prevent employers from hiring women. Evidence from Denmark tentatively suggests that this indeed is the case in some companies. The integrated nature of the Italian IT sector might therefore be related to the contract types.

In addition to recruitment and contracts we have established that the working conditions in IT can be a barrier to female employment. Women in all three countries are mainly responsible for the care of the family, and are therefore less flexible with regards to long-working hours. If women are unable to provide the time-commitment that is required employment can become a problem. Given that there are many women in the Italian IT sector, one could suggest that this is not the case. However what we find is that the majority of women in the sector are still young and not engaged in family duties. Since most of these young women are currently employed on atypical contracts, we can expect a change in the share of women in the sector in the near future. Our evidence also suggested that firms who offer tele-working arrangements and/or flexible working hours employ more women than average. This too is an indication that female employees are subject to different conditions then men when linking work life and family life.

Linked to the issue of work and family life is the issue of women returners to the labour market. While on the increase in other sectors of the labour market, the fast changing pace of the sector makes it also difficult for women to return after a maternity break: "The IT industry is so fast, if a woman takes a year's

maternity leave, it is likely to be almost a new company when she comes back (British interviewee).

Typical female occupations within the sector

The statistical evidence has shown that women are entering the sector to an increasing extent in all of the countries. However, what we cannot see from the figures is into what occupations women are entering, and whether these occupations differ in terms of wage and employment conditions. Our qualitative survey has revealed that in especially Italy, but also in Denmark, women occupy different job responsibilities and tasks then men.

In Italy evidence has shown that the increase in female employment is mainly into jobs at the lower levels of the occupational hierarchy. These occupations are mostly customer-related (call-centre operators, service assistants) and are characterised by either fixed term contracts often on a part-time basis or self-employment contracts. The reasons given for this hierarchical segregation is that women in general are responsible for the family and due to the lack of family services, the majority of women cannot provide the time commitment that is necessary in order to work in higher level occupations. One observer stated that 'women invest less in their career due to the social division of family care' and another again that 'the presence of women in managerial positions is hindered, or slowed down, by persisting inadequate levels of family services, and by male lobbying inside the firms'. Another reason can be that women only recently have entered the sector, and are therefore at present mainly found at the lower levels of the job ladder.

In addition to this hierarchical segregation, there is a tendency in all three countries of women occupying jobs that relate to service, for example customer care, project management and personnel management, whereas men are mainly found in the highly technical positions such as system designers, programmers, software engineering etc. This inter-sectoral segregation is highly significant and one we term 'job-functional segregation'. The typical female occupations are generally less rewarded than male occupations, both in monetary terms and in status. In addition, the career paths are often shorter and less visible in the firm. By comparing women and men with the same formal qualifications upon employment to the firm, it was clear that in the majority of especially the larger firms, job-functional segregation was more a norm rather than an exception. This can partly explain the wage gap in the sector.

Promotion - opportunities, requirements, procedures

In the smaller firms especially it is difficult to talk about promotion as there is no organisational hierarchy. There is a flat organisational structure whereby - in the majority of cases - employees are promoted in the sense of more pay and (project) responsibility. This is however very organic, informal and relatively invisible. In Denmark, Britain and Italy procedures for promotion are set and promotion is normally via the internal route. When no internal candidates are found, recruitment into a senior position is external. Progression means above all greater autonomy in work duties. Extensive career paths are simply not

available and people will leave the firm to go to larger companies or to start a company themselves.

Informal promotional procedures are also used in larger companies. Internal promotional recruitment is preferred in both Britain and Denmark, whereas in Italy professionals (high level) are recruited externally. These internal promotions are based on a pragmatic set of criteria (skill, training, software package knowledge, etc.). In the larger enterprises an effective career pattern is one that starts from technical duties and competences and leads to managerial ones. Especially the knowledge of how to manipulate, integrate and develop new software was referred to as giving access to higher technical positions. In Italy 'tenure' is certainly a criterion in the larger and older companies, but not so in the smaller ones, where high-level professionals often leave to go to larger companies or to start their own firm. For the consultant/managerial route, managerial capabilities such as supervisory and communication skills are required. After entry, managers look to work experience and time availability as grounds for promoting their employees, and this favours men. While recruitment is becoming more formal, career processes are much more informal.

All countries reported a lower number of women working at higher levels, but numbers are not monitored. In Britain there were no women present in the top layer of several large IT companies. Similarly in Italy, although women form 50% of overall IT recruitment, their relative percentage differs at management level (20%). It should be noted, however, that this proportion is rapidly increasing, as only ten years ago it was less than 5%. British interviewees referred to work/life balance problems, the male-dominated working culture and informal networks as creating a glass ceiling: women and their capabilities are more invisible to senior staff than men. Managers informally pinpoint juniors with potential to be 'groomed for promotion'. However, information to the contrary also exists. In Denmark several interviewees considered that the relatively few female software engineers in the sector who managed to stay with the occupation were more visible than their male counterparts and in this sense actually had an advantage over the men when promotion opportunities arose. Indeed, data on the number of female middle-level and high-level managers exists and shows that roughly 15% of all managers are women (DISCO/ISCO codes 213 & 312 - source: Statistics Denmark 2003).

British interviewees reported that women had complained of their insufficient critical mass to change the male-dominated working culture, especially in larger firms.

The consequences of job-functional segregation become therefore more evident over time. The highly technical occupations require a constant re-skilling of the employee as new systems and programming languages are developed. If women, due to family commitments, to a lesser extent then men are able to spend time on further training and the constant requirement to learn new skills, their initial technological competences will very quickly become out-dated. The career paths for women and men are thus different. Men in technological positions can, if they wish, change career paths and enter the customer-relation or project management line. Women on the contrary have more difficulties in en-

tering the typical male career paths, as their technological skills might not be sufficiently developed.

However, little information is available about promotion practices and their effect on the promotional chances of women. Even though there is evidence of the existence of a 'glass ceiling'- the share of female managers ranges between 12-25% - women have entered the sector at a latter stage then men, and will therefore necessarily at present be underrepresented in higher level positions. Some larger companies have though acknowledged the negative impact of their traditional promotion practices, and are moving to procedures where women are actively targeted. More then promotion practices, however, promotion criteria are seen to influence women's promotional chances; these are linked to tenure and working commitment in terms of hours and flexibility. Those who have been away from the labour market (for instance, on leave) will be in an inferior position regarding skill levels and experience. In Italy, for instance, up to middle-management level career chances for men and women are substantially the same but from middle management upwards time availability is what makes the difference. If the expected work commitment in IT remains the same, the increase in female participation in the sector is not expected to translate automatically into a rise in the number of female managers.

The future IT labour market - do women fit in?

As we have seen, women in the IT sector meet barriers to employment as well as barriers to promotion. The present dominance of informal recruitment procedures that have a negative affect on female employment chances are however not a necessary constant. Research has indeed shown that informality of recruitment methods is to a certain extent linked to economic conditions, revealing a cyclical pattern in the use of informal recruitment methods, with greater reliance being placed on them during periods of high unemployment (Russo et al. 2000). Formal recruitment procedures can therefore be expected to be more common in the future, however this does not necessarily remove the barrier that women face in terms of statistical discrimination. The lack of critical mass of women to change company culture and the male-dominant culture in managerial positions is also given as a reason for lack of participation by women. The increasing amount of women in IT relevant educations and in the IT labour market will, however, influence the commonality of women in the sector. This can, at least in principle, lessen the negative affects of statistical discrimination and create stronger social networks that consist of both women and men.

Internally in companies certain practices serve to maintain a form of hierarchical segregation that can only be overcome by a change in attitudes amongst employers and employer representatives. These count the current promotion criteria that are set up by employers. Women will necessarily take time out of work in connection with childbirth. If employers maintain that tenure and work reliability are crucial criteria for promotion yet at the same time are afraid to commit to a female manager out of fear of her being absent from the company, it is hard to see that the share of female managers will substantially increase in

the future. This point is also linked to the expectation that a manager needs to be able to offer a huge time commitment and must therefore be able to work long hours. In Denmark the vast majority of firms now consider a healthy work life - family life relation to be more positive for the firm in the long run, and are now changing their expectations towards employee commitments accordingly. This in turn is proving to have a positive affect on the share of female employees and managers. In Britain companies with extensive work life balance practices & support have not seen a significant increase in the share if their female workforce however, neither an improvement of retention. The acceptance of use of this available support in the department & team might be a possible explanation for the difference between Britain and Denmark.

Other possible initiatives could be that firms monitor their internal recruitment practices, and gender mainstream them accordingly. The lower status given to typical female occupations, as well as the unequal access to promotional job ladders are also changeable, and can for example be overcome by introducing managerial rota systems in the company. In general, and above all, employers have a huge responsibility in acknowledging the gender consequences of their common practices. Another example of this is whether further training takes place in- or outside normal working hours. In the latter case, evidence has shown that women to a lesser extent then men take further training courses, which again in turn affects their promotion chances. By acknowledging this, companies can provide further training inside working hours thus giving all women and men equal access to training.

However one factor seems to be essential for the labour market opportunities of women. The social division of labour in households and the interrelated effect this has on women's availability to the labour market need to be addressed and acknowledged by others than the families concerned. Whether child-care facilities are provided by the public authorities or by individual firms, their existence has a strong positive impact on female employment. This problem is expected to affect the Italian women in the sector in the near future. The current large cohort of women in employment are reaching childbearing age, yet at present have little chances of maintaining their employment due to a general lack of childcare facilities. In addition, due to the contracts on which they are employed, many of these women are not covered by either maternity schemes or employment rights.

Both company practices and government policies are called on to address the consequences of their actions on gender. Many of the larger multinational IT companies in Europe that are highly influenced by American corporate culture, have actively introduced diversity management policies and equal opportunity personnel policies. Interviewees from all three countries have also stated that if women want to make a career in IT, their best option is to find employment in one of these companies. However the many small, and less resourceful, IT companies across Europe are not necessarily in a position where such policies easily and effectively can be introduced. One way of addressing this could be through the creation of regional networks of companies, who can work together on providing and securing equal pay for equal work, training, child-care facilities and so forth. By sharing the costs of training and the supposed financial risk

of employing women, smaller companies will also benefit from having a diverse workforce.

With regards to the future IT labour market the question remaining is therefore not do women fit in, but rather can women fit in?

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Christina J. Colclough, FAOS
Elisabeth Michielsens, University of Westminster

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1. We focus on the IT service industry, not manufacturing industry. Overall IT services are less 'integrated' in terms of gender than manufacturing, which is why we choose to focus on the former.
2. Statistically we define the IT service sector slightly differently from the widespread OECD definition of the ICT sector, which 'covers a combination of manufacturing and services industries that capture, transmit and display data and information electronically' (OECD 2002). In its place, we define the IT service sector using NACE code 72, which covers the following areas of activity: 72.1 Hardware consultancy; 72.2 Software consultancy and supply; 72.3 Data processing; 72.4 Database activities; 72.5 Maintenance and repair of office, accounting and computing machinery; 72.6 Other computer related activities
3. All payments for the pay-period under piecework and other payment-by-results systems, bonuses including profit-sharing and commission, and other incentive payments.
4. Mostly interviewees in large IT companies.