IS ICT EMPOWERING WOMEN IN EGYPT? An empirical study

By Mona F. Badran[1]

Lecturer at Faculty of Economics and Political Science,

Cairo University

Abstract

In this study we will focus on the impact of ICT ownership on the gender divide and whether is ICT really empowering women in Egypt. Furthermore, we will explore the effect of ICT on women's lives in relation to other factors like education and income. Finally, recommendations are given to the policy maker in order to increase ICT's role in empowering women in Egypt and enhance the gender equality. The contribution of this paper is the creation of ICT ownership index from the sample data ELMPS and then creating a women empowerment index as well. Results reveal that ICT ownership index is largely influenced by education and gender, while ICT ownership index has a significant impact on women empowerment in Egypt. However, controlling for other individual characteristics like women's occupation and economic activity, ICT ownership index becomes statistically insignificant.

Keywords: ICT, gender inequality, women empowerment, ICT ownership.

[1]. e-mail: samifarah.mona@gmail.com Tel: 202 22581768

The author is grateful for the comments of two anonymous reviewers of the IFIP WG 9.4.

1. Introduction:

Information and Communication Technology (ICT) play a critical role in today's society. In the Middle East and specifically for this study, in Egypt, the access to the Internet and other forms of ICT, like mobile phones, PCs, colored TV, varies, however, from men to women and between urban and rural communities. This has been attributed to the existing gender inequality between men and women, such that the implementation of ICT in the society exerts, and sometimes exacerbates, the same divide in the ICT usage patterns between men and women. In Egypt, the Egyptian government is giving great attention to transform the Egyptian society to a knowledge-based society. As a result, ICT initiatives were launched like PC for every home initiative, Free Internet initiative and e-strategies. However, the inequality in access generally called digital divide[2], still exists along the lines of gender inequality or gender divide. This is considered an unexpected outcome of the technological change, since it is really expected that ICT would empower women and enhance their role in today's economy. In this study we empirically investigates the relationship between women empowerment and ICT and whether the digital gap is still existing between male and female, and what role does ICT play in empowering women in Egypt.

Finally, this study aims at presenting the policy maker with the recommendations regarding the role of ICT in women empowerment in the Egyptian society using econometric techniques. Eventually, these recommendations can also be applied in the MENA region.

This paper is divided into the following sections, first I will highlight the importance of ICT in everyday life, the difference between the impact of ICT on men and woman, the concept of gender divide and the role of ICT in gender inequality. Then there is a review of the main themes in the literature, followed by the empirical study that is divided into the following sections: Data Sources, Data analysis, The Empirical Model and Methodology. Finally I conclude with policy recommendations.

[2] DiMaggio,P., Hargittai, E., Celeste,C. and Shafer, S. (2002) " From Unequal Access to Differentiated Use: A Literature Review and Agenda for Research on the Digital Inequality" Edited by Kathryn Neckerman. New York: Russell Sage Foundation. 355-400.

1. ICT in everyday life:

Current research indicates that Information and Communication Technology (ICT) is an enabling environment for economic growth. ICT improves business, education and employment opportunities. Moreover, ICT facilitates communication between people, since it increases social interaction.

If access to, and use of ICT, is directly linked to social and economic development, then it is imperative to ensure that women in developing countries understand the significance of these technologies and use them in order to contribute effectively in their countries' development. Otherwise, they will become further marginalized from the mainstream of their countries and of the world.[3] Furthermore, accessing computers and using it is an important factor determining wage potential. In the USA, workers who use ICT are typically paid 10-15% higher than non computer users holding similar positions.

Thus, those who have insufficient resources from, or experience with new communication technologies, will be further marginalized and excluded from human and social capital. Some also claim that even when these women later become users, their disadvantage will remain. However, this was criticized by the "SIGIS" report in 2002. Thus, according to this report, although women have adapted late to new technologies like the Internet, they have succeeded in narrowing the gap in recent years[4].

2. The difference between the impact of ICT on men and woman in Egypt in urban vs. rural areas:[5]

The way ICT is applied today has largely been an extension of our socialization. Traditionally, in Arab countries, women have had a subordinate position to men, where, for example, she may

[3] Nancy Hafkin and Nancy Taggart (2001) " Gender, Information Technology, and Developing Countries" Academy for Educational Development (AED), For the Office of Women in Development Bureau for Global Programs, Field Support and Research United States Agency for International Development

[4] Ahuja, MK. (2002)" Women in the information technology profession: a literature review, synthesis and research agenda", European Journal of Information Systems, 11, 20-34.

[5] Angela M. Kuga Thas, Chat Garcia Ramilo, Cheekay Cinco,2007 "Gender and ICT", UNDP

contribute materially to the household but her husband makes the decisions on how the income is spent or she is not even allowed to work and is not considered a productive member of the society. Additionally, most governing bodies are dominated by men; legislative and judicial decisions often lack a gendered perspective and do not represent women's interests. At the macro-level, supposedly 'gender-neutral' ICT policies regarding education, training and price structure may have an unintended negative impact based on gender roles and access to ICT resources. In urban areas, there is a high percentage of ICT infrastructure ownership like computers and mobile phones for females. However, female usage of computers is still less than men and mobile ownership is also less (25% to female whereas 75% to male). As to visiting ICT clubs and using these facilities, indicators reveal that in urban areas 55.48% of internet cafes users are male while 44.52% are female.[6]

There are, nevertheless, attempts to benefit from ICT and use it as a mean to empower women in Egypt. In rural areas in Egypt, where female specifically face the major obstacles to education and usage of ICT, there are new ways that NGOs, under the umbrella of the Egyptian government, are targeting the problem of digital divide and using ICT to empower women in these areas. The initiative of ICT4IE[7] , "using ICT, namely internet and multimedia, for illiteracy eradication", had a great impact on rural communities in Egypt. Instead of going to school, young girls take home- lessons with the help of computers and CD –Rom multimedia. The new way of transmitting the information and educational material to young girls using laptops on small tables that are originally used for dining, is in harmony with the environment and the culture in rural areas. It also assists mothers in raising their children and helping them in attaining their education.

A study examining the progress of 90 students in the abovementioned program indicated the following results, classes using software of the ICT4IE, had 86% attendance compared 57% attendance by those courses not using software. Furthermore, while the regular classes had a

[6] www.mcit.gov.eg

[7] http://www.mcit.gov.eg/ICTTrustFund.pdf

passing rate of only 40%, the class using the software had an 80% passing rate. Currently this software is being distributed in 9 governorates by NGOs and used in technology clubs and schools in Egypt.

Working women were considered the number one beneficiary of the ICT in their jobs. Clerical jobs required these skills and thus women were introduced computers in their offices to perform simple tasks. One of the occupations that women tend to have, and in which ICT is being sought as a vehicle to assist in its development, is the occupation of handmade goods. The original idea was that ICT could actually open new markets and increase profits for Egyptian craftswomen and artisans. However, research attributed the failure of this idea due to failure in other aspects of the production of the final goods like in design and quality and not the mere usage of ICT in marketing.

Nevertheless, the internet was considered as a viable resource for some of the craftswomen. Continuing their education and increasing their skills to include computer and internet skills. This improved their income level and transferred them to clerical jobs or to supervise other craftswomen. These craftswomen, however, would typically stop their production of crafts. So, we refer to this process as "making up the ladder to additional education." [8]

Comparing the abovementioned attitudes toward ICT and Internet with advanced countries like in USA, we find that by 2001women and men were equally likely to be online (Losh 2003). From late teens to the late 40s, women are *more* likely than men to use the Internet; men acquire an increasing edge after age 55[9]. In this study there was clear distinction made between the access and use of the Internet and it was found that the access is much higher than the usage rate of the Internet meaning that families or individuals who have access to the internet don't use it often. This is to be contrasted to the findings from the developing countries where access (subscribers) is much lower

[8] Leila Hassanin, 2009, " Egyptian women artisan facing the demands of modern markets: caught between a rock and hard place", African women and ICTs investigating technology, gender and empowerment, edited by Ireke Buskens and Anna Webb, IDRC

[9] Op.cit, DiMaggio,P. (2002)

than the users of the internet.[10] This reflects the fact that access in developing countries, like Egypt, is still relatively expensive and that IT cafes and generally public point of access are the mean to increase broadband penetration in these countries.

Generally, the literature [11]points out to several factors that contribute to the digital exclusion of women, these include: limited access to systems and hardware (personal and infrastructure), IT illiteracy, and the lack of content that is useful and related to this group, limited access to telecommunications policy process, the lack of engagement and awareness of existence of the technology. Overcoming the material access and making Egyptian women realize the need for the technology constitutes an important part of the solution to the digital exclusion problem.

3. Literature Review:

The literature review is organized as themes that explain the various approaches of the effect of ICT on women: First theme is Women's rights in attaining equal share of ICT through international conferences and meetings: According to Sabanes Plou[12], there are ways with which women attempted to secure their equal rights to ICT:

1. The United Nations forth conference on women in 1995 in Beijing has been considered as a cornerstone in promoting of women's rights to equal share of ICT. It stated 2 strategic objectives: Firstly, it is necessary to increase participation of women in expression and decision making in and through the media and new technologies of communication. Secondly, to promote a balanced and non-stereotyped portrayal of women in the media. In this regard, it is worth mentioning how the early adapters of the technology in developing countries were nongovernmental organizations (NGOs) working on women's rights and empowerment issues on behalf of women. This was clearly the case when women were mobilized around the world in preparation for, and in their actual participation at the Fourth World Conference on Women in Beijing in 1995. In these cases and in the cases of women entrepreneurs in small- and medium-sized enterprises (SMEs), women are using ICTs to

[10] Badran, M.F., Ragab, A., Sherbini, A. (2007) "What determines broadband uptake in emerging countries? An empirical study.", ITU, World Telecommunications Indicators meeting, Geneva, Switzerland.

[11] Op.cit, DiMaggio, P. (2002)

[12] *Dafne Sabanes Plou* (2003) "What About Gender Issues in the Information Society? ", *Communication and Information society.*

make their organizations and businesses more efficient and effective. Where these groups of women are concerned, women have strived to be their own agents of change and decision-making, ensuring that the technology serves them. Another important milestone was the World Summit on the Information Society (WSIS) conference in Geneva 2003, declared the following principles:

"We affirm that development of ICTs provide enormous opportunities for women, who should be an integral part of, and key actors, in the Information Society. We are committed to ensuring that the Information Society enables women's empowerment and their full participation on the basis of equality in all spheres of society and in all decision-making processes. To this end, we should mainstream a gender equality perspective and use ICTs as a tool to that end:" Noting that the WSIS Plan of Action refers to the special needs of women in relation to capacity building; enabling environment; ICT applications; cultural diversity and identity; and follow-up and evaluation.

Preparing for the forthcoming WSIS conference in Tunis, another conference took place in Seoul in June 2005[13], with affiliations in academia and NGOs as well as government, international agency, and industry. The representatives were participants in the Forum on Gender and ICTs for the World Summit on the Information Society 2005. They confirmed the recommendations and principles reached in the Beijing Platform for Action and the Convention on the Elimination of Discrimination Against Women. In Tunis, 2005 during the WSIS conference , a Declaration of Agreement Women and ICT[14] was developed by multiple organizations around the world under the leadership of the Center for Women and Information Technology (CWIT) in support of women and their access, use, development, and design of ICT and their advancement in ICT careers. This would enhance women and ICT development efforts and encourage sharing information and resources.

Another theme in the literature stems from the fact the women's access to ICT is part of her human rights: Relating or connecting getting access to, and ownership of ICT, with the struggle

[13] http://www.women.or.kr:8080/jsp/wsisforum/forum_declaration.jsp

[14] http://www.umbc.edu/cwit/tunis.html

against poverty, unemployment, violence, racism and discrimination and the consolidation of democracy and economic growth. This would elevate the importance of their participation in ICT programs.(Bonder 2002)[15].

The third theme in the literature is the 'liberal feminists' theme[16]: According to this theme there exists 'exclusion' of women from ICT, specifically in terms of access to ICT (computers, the internet) at various stages and in various settings across their life course (home, school, work). This theme concentrates on the under-representation of women in IT education courses and within the IT industry. This approach also looks at the conditions of work for women in the IT sector, including the low pay and limited progress. According to this approach the most notable aspect of the 'liberalist' agenda is the recommendations for more action. It is concerned with the women in Science, Engineering and Technology (SET). In his paper "From the Woman Question in Technology to the Technology Question in Feminism: Rethinking Gender Equality in IT Education" Henwood [17] stresses the importance of improving access to ICT; To encourage more women into computing courses (and more generally SET courses) at all levels of education. He also points out to the need for better Equal Opportunities and Managing Diversity legislation and initiatives to advance the lot of women in ICT and more generally SET. A conclusion is made that through better gender equity, with the ICT, 'skills gap' being narrowed through the greater participation of women in the ICT industry for example (E-Skills/Gartner 2004), the digital divide could be narrowed.

The feminist theme to the impact of technological change on the welfare of women is considered to alter the gender inequality. Plant [18] referred to the "cyberfeminism" and predicts the creation

[15] Bonder, G.(2002) "From access to appropriation: Women and ICT policies in Latin American and the Caribbean", UN

[16] Moore,K., Griffiths, M. and Richardson,H. (2005) " Moving In, Moving Up, Moving Out? A Survey of Women in ICT", Conference: Symposium on Gender and ICT: Working for Change

[17]Flis Henwood (2000) " From the Woman Question in Technology to the Technology Question in Feminism: Rethinking Gender Equality in IT Education European Journal of Women's Studies, Vol. 7, No. 2, 209-227

[18] Plant, Sadie (2000). "On the Matrix: Cyberfeminist Simulations". Pp 265-75 in The Gendered Cyborg. Edited by Linda Janes, Kath Woodward and Fiona Hovenden. London: Routledge.

of an alternative feminized cyberspace network which speaks of a freeing space for women unrestricted by social location [19](Graham 2001).
Criticisms of the liberal feminist theme can be summarized as follows: It fails to question women's inclination to participate in the ICT activities and industry. This could be due to the ignorance of women due to their lack of education in certain countries which leads to failure to attain knowledge skills.

The next theme that is found in previous work on this topic includes ICT as an obstacle for women to get certain jobs: In the same paper, Graham suggests, with others, that there is more to the women and computing 'problem' than getting more women into the IT industry and into particular post. When studied in the right context, ICT as a job environment is not suitable for many women, especially the long working hours (Wise 1997). In addition the need to be constantly present and mobile is one of the aspects of the IT culture. The negative perception of part time workers in the IT sector makes it even harder to women to survive in this profession. The deeply embedded 'masculine culture' of IT - these aspects need to change before (some) women can comfortably find a place within the IT industry. There the suggestion, however, that the IT industry needs to broaden its appeal to a more diverse pool of talented people and thus include more women. (Women and Equality Unit 2004, Platman and Taylor 2004).
There is one caveat that we have to keep in mind when talking about women's work in IT.
The expanding IT sector and the new information society requires a mix of work which is highly skilled and another kind of work which is routine and low skilled (Aronowitz and Di Fazio 1994). This has to be taken into consideration when investigating the impact of ICT on women empowerment at work.
On the other hand there is the fourth theme "the Social Constructionism Theme", which argues that technologies are the product of social interactions. This means that what we think them to be capable of, and not capable of, or who we think they are 'suitable' and 'unsuitable' for, and so on, as determined by social interactions. Hence our understandings of (here information communication) technologies are culturally and historically entrenched, and profoundly

[19] Graham, E.(2001), "Cybogs or goddesses? Becoming divine in cyberfeminist age" *Virtual Gender technology consumption and identity,* edited by Eileen Green and Alison Adam.

according to gender[20]. There are inherent features of the new technologies, like the Internet for example, in terms of 'labour-saving' devices and these technologies' supposedly liberate women, through the introducing of 'new' forms of working such as 'tele-work' for example (Golding 2000, Wilson and Greenhill 2004). ICT offers new employment opportunities for women in call centers, mobile telephone service and software industry. Women are using ICT in self employment and teleworking, as well as using ICT from home. According to a report published by the ILO (International Labor Organization)[21], women's role in digital era is mainly in information and online work.

In modern society, ICT has important applications in office work, manufacturing industries, banking and many similar applications. Thus ICT has become indispensible tool in our society. The fifth theme is important as it considers the information society as a possession society not a knowledge society.[22] The procession of hardware plays a major role in the uptake of IT. Once someone has access at home to this hardware, then income is of little importance. Women across the board have little access to ICT compared to men and they make little use of ICT in general. This approach can be criticized in that in developing countries women can rent or use ICT products in public point of access not necessarily own their PC but access the PC and the Internet from Internet Cafes for example.

In conclusion, the literature[23] regarding women's participation in the labor force indicates the gap between men and women in general, and in work status, wage, occupation distribution and career choice in particular (Ahuja, 2002; SIGIS, 2002). Although this trend has changed in recent years and more women are joining the labor force, there still remains a wide gap between the genders that might lead to different attitudes and behavior in everyday life, including adoption and usage of new Information and Communication Technologies.

---

[20] Akrich, M. (1992) 'The De-scription of Technical Objects' in E. Bijker, and J. Law, (Eds) *Shaping Technology/Building Society: Studies in Sociotechnical Change*, Cambridge, Massachusetts: The MIT Press.

[21] Albertsen, N. and Diken, B. (2001) *What is the Social?* (electronic), www.comp.lancs.ac.uk/sociology/soc033bd.html.

[22] L.Van Dijk, J. de Haan, and S. Rijken "Digitalization of daily life", Digitalisering Van de Leefwereld: Een Onderzoek Naar Informatie- en Communicatietechnologie en Sociale Ongelijkheid (Den Haag: Sociaal en Cultureel Planbureau, 2000).

[23] Brynin,M., Raban,Y., Soffer, T. (2005) "Chapter 5: The New ICTs: Age, Gender and the Family", the e-living consortium. book e-Living: Life in a Digital Europe, an EU Fifth Framework Project

Many studies indicate that education level is one of the major factors that influence ICT access and usage in general. The literature on gender emphasizes the importance of this variable and shows a gap between men and women in the education level in general and in technology education in particular. As already suggested, sociologists claim that this gap starts early in the kindergarten, and continues through primary and secondary education. Boys tend to show more interest than girls in technical aspects relating to games. This reflects directly on their future decisions regarding education level and educational subjects, occupation and way of life (Dryburgh, 2000). However, education now differs very little between men and women

4. Data Sources:

Cross sectional data set for men and women for the year 2006 is obtained from "The Egypt labor market panel survey of 2006" (ELMPS 06). This data set is for public access and the survey was sponsored by the Population Council, Economic Research Forum and Capmas. The two Egypt Labor Market Surveys (ELMS's 1998 and 2006) were nationally representative surveys. The ELMPS06 is a follow-up survey to the Egypt Labor Market Survey of 1998 (ELMS 98), which was carried out in November-December 1998 by ERF in cooperation with the CAPMAS. ELMS 98 was carried out on a nationally-representative sample of 4,816 households. The ELMPS 06 is the second round of what is intended to be a periodic longitudinal survey that tracks the labor market and demographic characteristics of the households and individuals interviewed in 1998, any new households that might have formed as a result of splits from the original households, as well as a refresher sample of households to ensure that the data continue to be nationally-representative. The field work for ELMPS 06 was carried out from January to March 06.

The Sample:

The final sample of 8,351 households is made up of 3,684 households from the original ELMS 98 survey, 2,167 new households that emerged from these households as a result of splits, and a refresher sample of 2,498 households. Of the 23,997 individuals interviewed in 1998, 17,357 (72 %) were successfully re-interviewed in 2006, forming a panel. The 2006 sample contains an additional 19,743 "new" individuals. Of these 2,663 individuals joined the original 1998 households, 4,880 joined the split households, and 12,200 were part of the refresher sample of households.

Data Limitations:

There are many items that were not found in 1998 survey but were added recently to 2006 round. For example, the durables in 2006 include three new items namely, dish, mobile phones and computer. Also, agriculture enterprises was added in 2006, this helped in building more comprehensive SES (Social Economic Status index) of rural areas.

This study is based on the assumption, namely all individuals in a household have equal access to ICT services and assets. Although this assumption might sometimes contradict with real life situations especially in rural areas, but due to data limitations, i.e. how data was collected namely on household level instead on individual level, such an assumption was necessary.

5. The Empirical Model and Methodology:

The following 2 models will be estimated using Ordinary least square:

1. ICTown index = β0 + β1edu + β2 gender + β3 age +β4 age2 +β5 real monthly wage +β6 region+ β7 employment status + e

2. Women Empower index= β0 + β1 ICT index + β2 age +β3 age2 +β4 real monthly wage +β5 Empl status+ β7edu+β8 region + e.

Where: ICT ownership index is formed and used as the dependent variable. It consists of the following questions: Do you own a telephone, does your family own a colored TV, does your family own a computer, does your family own a cellphone, and does your family own a sat. dish. The values of the ICT ownership index scaled ranges 1-100, where the minmum value of the index indicates that the individual does not own ICT products or goods, and the maximum value means that this person owns all the ICT products. So, the more ICT products ones owns, the more will be the value of the index. The summary statistics are presented in table 1 in Annex:

This index was created using 2 methods: The Principle Component Analysis technique and the simple sum technique. Both of them will be explained in the methodology.

5.1. Methodology of construction of the ICT Ownership index:

a. The simple sum methodology:

We aggregated all the indicators that constitute the index namely ownership of fixed phone, mobile phone, computer, satellite dish and colored TV.

b. The Principal Components Analysis Technique

This study used multivariate statistical techniques particularly, principal components analysis as it can play a useful role in constructing composite indices or in arriving at analytical constructs based on a number of indicators (Fergany, 1994). In addition techniques to analyze panel data was shown. The analysis of panel data relied on the fixed effects time series model to capture the determinants of change in the socioeconomic status between the two periods 1998 and 2006.

Principal components analysis, especially, can be used effectively to obtain the most appropriate weights for the indicators of the proposed indices and sub-indices for the two years, such that the extracted first principal components explains the largest percentage of total variance captured by this component.

Principal components analysis technique is a statistical method that used to identify a relatively smaller number of principal factors that can be used to represent relationships among sets of many interrelated variables. This procedure creates a number of new uncorrelated components. It is often desirable to estimate principal components scores for each case. The principal components scores are easy to understand and can be used in subsequent analysis to represent the values of the principal components instead of a large number of correlated variables. A principal component can be estimated as a linear combination of the original variables. That is, for case k, the score for the jth principal component is estimated as follows:

$$\hat{P}_{jk} = \sum_{i=1}^{p} W_{ji} X_{ik}$$

Where X_{ik} is the standardized value of the ith variable for case k,

W_{ji} is the principal component score coefficient for the jth principal component and the ith variable and p is the number of variables. The minimum requirements to achieve the principal components analysis procedure are two or more numeric variables (Norusis, 1996).

The principal component score coefficient matrix is $P = R^{-1}A$ where R^{-1} is the inverse of the matrix of correlation among variables and A is called principal components loads (weights) matrix[24]. The factor loading matrix is found by straightforward matrix multiplication as follow (Fidell and Tabachinck, 1989):

$$\mathbf{A} = \mathbf{V} \sqrt{\mathbf{L}}$$

where V: is a matrix whose columns are the eigenvectors of R

L: is a diagonal matrix whose main diagonal elements are the eigenvalues of R

Since one of the goals of principal components analysis is to obtain components that help explaining the correlations among all variables, the variables must be related to each other for the factor model to be appropriate. If the correlations between variables are small, it is unlikely that they share common principal factors. If the hypothesis that the population correlation matrix, is an identity matrix cannot be rejected, the researcher should reconsider the use of the principal components model.

The most commonly used method for principal components extraction is the first principal component that conducted from the principal component analysis method. In principal component analysis, linear combinations of the observed variables are formed. The first principal component is the combination that accounts for the largest amount of variance in the sample. The second principal component accounts for the next largest amount of variance and is uncorrelated with the first. Successive components explain progressively smaller proportions of the total sample variance, and all are orthogonal uncorrelated with each other (Afifi, 1996).

This procedures produce an eigenvalue for each component. This value indicates how much of the variance of the original indicators was explained by that component.

Table (1): Coefficients of the principal component analysis

[24] Factor loading: The correlation between the original variables and the factors, and is the key to understanding the nature of a particular factor.

	coefficients		
Variables	Urban	Rural	All Egypt
fixed phone	0.4074	0.4225	0.4138
Computer	0.4685	0.4045	0.4504
Mobile	0.515	0.4928	0.5084
Dish	0.4634	0.4744	0.4606
color tv	0.3669	0.4358	0.3941

The coefficients of the principle component analysis: PCA is an statistical regression analysis it called data reduction method, and its coefficients just like the coefficients of the regression. So, we can say that the existence of a fixed phone for example increase the score that the individual takes in terms of ICT ownership index by 0.4074 in urban and by 0.4225 in rural and by 0.4138 for all over Egypt. But in construction of the final index I estimate one for urban and another one for rural then add both indices for urban and rural in one variable to reflect Egypt. In this way we make sure that the person in a geographic area (location in urban for example) will be compared to a person in the same area.

The women empowerment index[25] is constructed using also the method of simple sum. It is simple sum of the records of five dimensions: the share of the women in decisions making in the household, Access to cash, Mobility, Less Violence exposure and Gender role. The minimum value of the index is 0 and the maximum value is 38.

5.2. Analysis of the regression models using the simple sum methodology:

Both Regression one and two are complete second order regression model which really estimates a quadratic function as it includes age in a quadratic form using ordinary least square method of estimation.

The first regression model was formulated as follows:

1. ICT own index = β0 + β1edu + β2 gender + β3 age +β4 age2 +β5 real monthly wage +β6 region+ β7 employment status + e

Where ICT own index is the ICT ownership index and it reflects the ownership of ICT assets. In the short model, the explanatory variables include gender (dummy variable), age, age squared (in order to capture the nonlinearity of the age), real monthly wage, region (dummy variable), employment status (dummy variable). In addition an extended model was also estimated this model includes in addition to the explanatory variables controlled for earlier, more variables that reveal the characteristics of the individual such as occupation, sector (public / private), economic activity.

Using the simple sum methodology, we estimated the following equations both for the short and the extended models and we obtained the following results:

In the short model, the dependent variable is the ICT ownership index and the explanatory variables are education, gender, age and age square, employment status categories (wage worker, employer, self employed, unpaid family worker), region categories (Great Cairo, Alex and Suez, Urban lower, urban upper, rural lower, rural upper) and real monthly wage as a proxy for income are significant.

All levels of education all statistically significant and are positively affecting ownership of ICT assets. These are illiterate, literate without any diploma, elementary school, middle school, general high school, vocational high school, post secondary institute, university and above.

Age had the expected sign as well as the economic impact on ICT ownership is non linear and in order to capture the non linearity of age as independent variable on ICT ownership, we controlled for age as well as age squared which both resulted in significant coefficients with the effect of age on ICT ownership index diminishes as it increases.

Using the standardized beta coefficient we can determine exactly which of the independent variables mostly impact the ICT ownership index. Here university and above education compared to illiterate as the base group, is the most influential factor impacting ICT ownership index. This is expected since the ICT ownership index is expected to have higher values for this class of educated people, who are expected to utilize ICT products much more than all the other categories that constitute the education variable in our model. As to the regions, Cairo is the most important region that impacts the ICT ownership, which is also consistent with a priori

expectations since Cairo is the capital and is the most populous urban city with high standard of living. This is followed by Alexandria and Suez and at the region of Rural Lower Egypt has the least impact on the ICT ownership index in Egypt compared to the base group upper rural Egypt.

In the short model: the employment status dummy variable indicates that compared to the base group of wage workers, all the employment status groups are statistically significant. Using the standardized beta coefficient, the unpaid family worker such as the housewife is the one that impacts the ICT ownership index or owns more ICT assets compared to the wage worker. This can be justified that the housewife uses mobile phone and home computer etc. to empower herself.

When we add new explanatory variables in the extended model, all the added variables namely for economic activity (dummy variables): Mining, Manufacturing, electronics, construction, trade, transportation, service occupations. This was a dummy variable with the base group agriculture. All the economic activities were statistically significant and with expected positive sign. Thus, doing an economic activity compared to agriculture has a positive impact on ICT ownership. The private sector has the negative impact on ICT ownership compared to government sector. This is explained by the discrimination that women face in the private sector, as it provides less job opportunities for female employees compared to the government sector.

Using the standardized beta coefficient in the analysis, which are reported between brackets in the extended and short models, indicate that the most independent variable that influences ICT ownership index is again the university and above education compared to illiterate as the base group. The gender coefficient is statistically significant and positive which indicates that females compared to male have a positive impact on ICT ownership as they own more ICT products compared to men.

Then, I controlled for occupation (dummy variables) which includes the following categories, Legal and Senior officials and management, professionals, Technicians and associate professionals, clerks, shop workers, skilled agriculture and fish workers, craft and related trade workers, and plane and machine operators. The base group is elementary occupations. All occupations are statistically significant and have a positive impact on ICT ownership.

Women Empower index= β0 + β1 ICT index + β2 age +β3 age2 +β4 real monthly wage +β5 Empl status+ β7edu+β8 region + e.

Where e is the error term or the disturbance term. It follows a standard normal distribution.

Then, the women empowerment index, created as described earlier, was regressed on the following explanatory variables: ICT ownership index, age, real monthly wage, employment status (dummy variable), education (dummy variable) and region (dummy variable). In the extended model we added the women's occupation (dummy variable), economic activity (dummy variable), and sector (public/ private) (dummy variable).

As this study is about the impact of ICT on women empowerment we find that the ICT ownership index is positively affecting the women empowerment index and is statistically significant. This was not expected a priori, that the sign of the index to be positive, as it indicates that there would be a closing of the gender gap when it comes to owning the ICT essential products like fixed telephone lines and cell phones and computers and satellite dishes.

However, in the extended model, where I control for other characteristics of the female, the ICT ownership index is statistically insignificant. This is due to the digital divide that exists along the gender lines which is evident from the data obtained from the MCIT in Egypt. In addition there are specific barriers to women's access[26] and use of ICT, these include: high levels of illiteracy and lack of education which is needed to be able to use the ICT products like the Internet. Women have less time to spend online as they have a triple role of domestic, community management and productive responsibilities.

Women usually have less financial resources compared to men to cover the costs of access and equipment. Geographical location: where in developing countries women tend to live in rural areas more than men. Thus they have access to low quality of infrastructure and travel to ICT centers is much more costly and exhaustive.

[26] Huyer, S., Sikoska,T. (2003) "Overcoming the gender digital divide: Understanding ICT's and their potential for empowerment of women", Instraw Research Paper series No.1.

Age is empowering women according to our regression results in both expended and short models. The older the women the more empowered she is till certain age and then this takes the form of a negative effect as it is presented in the age squared explanatory variable.

The base group is women who live upper rural Egypt and are wage worker. Compared to wage worker, women as employers are empowered in the short model. In the expanded model, however, are not empowered. Compared to upper rural Egypt, living in all the regions is empowering women as all the regions are statistically significant and positive. Real monthly wage as a proxy for income is statistically significant and has a positive impact on women's empowerment index. The model overall is statistically significant as the p –value for the F-statistics is zero. This means that the variables as a group are explaining the model. R-squared is low however.

The occupation, compared to elementary occupation, we find that all the occupations are statistically significant; however they have the negative sign which is not consistent with a priori expectations. This means that the occupation has a negative impact on women empowerment, compared to elementary occupation. This is unexpected since having an occupation should actually have a positive significant impact on owning an ICT product. This sheds light on the role of gender gap at work as it reduces the empowerment of women.

All occupations have a negative impact on women empowerment compared to elementary occupations and are statistically significant except for professionals. So women who have an occupation compared to elementary occupation are empowered. Professionals, on the other hand, consist of a small percentage of the sample and women percentage is lower in this category. This explains why they are statistically not significant.

Comparing the short and the extended model we find that R-squared increased when we added new variable, however not much. This indicates that these variables are not really important. However these added variables, occupation, economic activity and sector eliminate the significance of ICT ownership. The short model, on the other hand, ICT ownership model has positive effect and is statistically significant on women empowerment.

Using the second method which is **Principle Component Analysis** we find the results of the short model consistent with the first method. So the CPA method serves as robustness check for the estimated model. Both the ICT ownership regression and the women empowerment regression show similar results to the first model that uses the method of simple sum.

6. Conclusion and Policy Recommendations and suggested future work:

This study aims at presenting the policy maker with the recommendations regarding the role of ICT in women empowerment in the Egyptian society. The different ICT initiatives like free Internet , PC for every home , reduced broadband prices and the different e-strategies are policies adopted by the Egyptian government to enhance and expand the concept of knowledge based economy. This should, however, lead to empowering all Egyptians to play a bigger role in the Egyptian society. Like most of the Middle East Countries, women in Egypt, are to large extent marginalized. The role of ICT especially the ownership of ICT equipments and more broadly the access to the new technology is a goal that is present in the policy -maker's agenda as presented in PC for every home initiative launched by the Egyptian government. This paper stresses the critical role that is attributed to ICT to empower women in considered as a new aspect of the ICT policy in Egypt. Teleworking, call centers, software industry and offshore services, all are encouraging more IT education and training in all levels of education, which would enhance girls and later women to become an active contributor to the Egyptian Economy's growth and development. This study proved that to large extend ICT is empowering women in Egypt. Thus, there is ample room for ICT to mainstream gender equality in Egypt. Promoting ICT training, encouraging ICT related employment and increasing ICT access and usage. All these policies related to ICT would further empower women and reduces the gender gap that exists in Egypt as well as in many other countries. Recommendations for policy makers, based on the results of the above empirical study, stress on the importance of education, household type and other factors that affect women empowerment using ICT. Women's access to ICT can be encouraged through the following ways: Public Access Strategies; Improving girl's and woman's access to education; Generating demand for ICT education; Making IT education and training available for woman and girls; Ensuring that woman get the right skills and providing Microfinance to women.

For future empirical analysis other variables that could be taken into consideration in are ownership and operation of an SME and access to credit. In addition we have to explore the variables that connect ICT to education, like usage of computers at school, whether primary secondary and preparatory schools.

References:

Akrich, M. (1992) 'The Description of Technical Objects' in E. Bijker, and J. Law, (Eds) *Shaping Technology/Building Society: Studies in Sociotechnical Change*, Cambridge, Massachusetts: The MIT Press.

Albertsen, N. and Diken, B. (2001) *What is the Social?* (electronic), www.comp.lancs.ac.uk/sociology/soc033bd.html.

Ahuja, MK. (2002)" Women in the information technology profession: a literature review, synthesis and research agenda", European Journal of Information Systems, 11, 20-34.
Angela M. Kuga Thas, Chat Garcia Ramilo, Cheekay Cinco,2007 "Gender and ICT", UNDP.

Badran, M.F., Ragab, A., Sherbini, A. (2007) "What determines broadband uptake in emerging countries? An empirical study.", ITU, World Telecommunications Indicators meeting, Geneva, Switzerland.

Brynin,M., Raban,Y., Soffer, T. (2005) "Chapter 5: The New ICTs: Age, Gender and the Family", the e-living consortium. book e-Living: Life in a Digital Europe, an EU Fifth Framework Project

Dafne Sabanes Plou (2003) "What About Gender Issues in the Information Society? ", *Communication and Information society.*

DiMaggio, P., Hargittai, E., Celeste, C. & Shafer, S. (2004). Digital Inequality: From Unequal Access to Differentiated Use. In *Social Inequality*. Edited by Kathryn Neckerman. New York: Russell Sage Foundation. 355-400

Dryburgh, H. (2000) "Underrepresentation of Girls and Women in Computer Science: Classification of 1990s Research." Journal of Educational Computing Research, 23, 2, 181-202.

Fergany, N. (1994) "Quality of life Indices for Arab Countries in an International Context", International Statistical Review, Vol. 62, No.2 pp. 187-202.

Flis Henwood (2000) " From the Woman Question in Technology to the Technology Question in Feminism: Rethinking Gender Equality in IT Education European Journal of Women's Studies, Vol. 7, No. 2, 209-227.

Fidell, Linda S. and Tabachnick, Barbara G. (1989): "Using Multivariate Statistics", Second Edition, Harpor & Row, Publisher, New York.

Gérard Valenduc, Patricia Vendramin, Caroline Guffens (2004), "Widening Women's Work in Information and Communication Technology, EC.

Golding, P. (2000) 'Forthcoming Features: Information and Communication Technologies and the Sociology of the Future', *Sociology*, 34 (1), pp.165-184.

Huyer, S., Sikoska,T. (2003) "Overcoming the gender digital divide: Understanding ICT's and their potential for empowerment of women", Instraw Research Paper series No.1.

Jacobs, J., Lim, S. (1995). "Trends in Occupational and Industrial Sex Segregation in 56 Countries." 259-93 in Gender Inequality at Work. Edited by Jerry Jacobs. Thousand Oaks, California: Sage.

L.Van Dijk, J. de Haan, and S. Rijken, Digitalisering Van de Leefwereld: Een Onderzoek Naar Informatie- en Communicatietechnologie en Sociale Ongelijkheid (Den Haag: Sociaal en Cultureel Planbureau, 2000). "Digitalization of daily life".

Leila Hassanin, 2009, " Egyptian women artisan facing the demands of modern markets: caught between a rock and hard place", African women and ICTs investigating technology, gender and empowerment, edited by Ireke Buskens and Anna Webb, IDRC

Moore,K., Griffiths, M. and Richardson,H. (2005) “ Moving In, Moving Up, Moving Out? A Survey of Women in ICT”, Conference: Symposium on Gender and ICT: Working for Change.

Nancy Hafkin and Nancy Taggart (2001) “ Gender, Information Technology, and Developing Countries” Academy for Educational Development (AED), For the Office of Women in Development Bureau for Global Programs, Field Support and Research United States Agency for International Development.

Norusis, Marija J. (1996) "SPSS for windows, Professional Statistics", Release 6.0.

Plant, Sadie (2000). “On the Matrix: Cyberfeminist Simulations”. Pp 265-75 in The Gendered Cyborg. Edited by Linda Janes, Kath Woodward and Fiona Hovenden. London: Routledge.

Praveen Dalal 2006 ,” Use of ICT for Women Empowerment in India” http:// cyberlawindia.blogspot.com/.

Rice, R., Katz, J. (2003) “Comparing internet and mobile phone usage:digital divides of usage, adoption, and dropouts”, Telecommunications Policy 27 (2003) 597–623.

Stata 10 (2007), "Stata, longitudinal/panel data Reference manual release 10" A Stata press Publication, StataCorp L.P, College Station Texas.

Wilson, M. and Greenhill, A. (2004) ‘A critical deconstruction of promises made for women on behalf of teleworking’, *Critical Reflections on Critical Research in Information Systems-2nd International CRIS Workshop*, 14th July 2004, University of Salford, UK.

Wise, J.M. (1997) *Exploring Technology and Social Space*, London: Sage.

World Bank's World Development Indicators 2001, pp. 35-36.

Warren, M. (2007)," the digital divide vicious cycle: Links between social disadvantage and digital exclusion in rural areas", Telecommunications Policy

www.oecd.org/dataoecd/34/37/2771153.pdf.

www.mcit.gov.eg

http://www.mcit.gov.eg/ICTTrustFund.pdf

http://www.women.or.kr:8080/jsp/wsisforum/forum_declaration.jsp

http://www.umbc.edu/cwit/tunis.html

ANNEX:

Table 1: Descriptive Statistics:

Variable	Numbers of Obs.	Mean	Std. Dev.	Min	Max
PowerIndex	12933	20.49	5.47	0	38
ICTurb	19658	0.00	1.46	-2.44	2.94
ICTrur	17482	0.00	1.38	-1.36	6.20
ICT Ownership index	37140	0.00	1.42	-2.44	6.20
ICTScaled	37140	28.27	16.48	0	100
ICT_Simple~m	37140	1.88	1.36	0	5
education2	30977	0.16	0.37	0	1
education3	30977	0.12	0.32	0	1
education4	30977	0.08	0.28	0	1
education5	30977	0.04	0.20	0	1
education6	30977	0.22	0.41	0	1
education7	30977	0.03	0.18	0	1
education8	30977	0.10	0.30	0	1
Age	37140	26.64	19.42	0	95
age2	37140	10.87	13.64	0	90.25
gender2	37140	0.50	0.50	0	1
Emp_Status2	14356	0.12	0.32	0	1
Emp_Status3	14356	0.08	0.28	0	1
Emp_Status4	14356	0.27	0.44	0	1
reg1	37140	0.15	0.35	0	1
reg2	37140	0.10	0.30	0	1
reg3	37140	0.13	0.33	0	1
reg4	37140	0.15	0.36	0	1

reg5	37140	0.25	0.43	0	1
Occupation1	14353	0.08	0.26	0	1
Occupation2	14353	0.11	0.32	0	1
Occupation3	14353	0.08	0.26	0	1
Occupation4	14353	0.03	0.18	0	1
Occupation5	14353	0.12	0.32	0	1
Occupation6	14353	0.35	0.48	0	1
Occupation7	14353	0.15	0.35	0	1
Occupation8	14353	0.06	0.23	0	1
Eco_Activi~2	14347	0.00	0.05	0	1
Eco_Activi~3	14347	0.12	0.32	0	1
Eco_Activi~4	14347	0.01	0.09	0	1
Eco_Activi~5	14347	0.06	0.25	0	1
Eco_Activi~6	14347	0.13	0.34	0	1
Eco_Activi~7	14347	0.06	0.24	0	1
Eco_Activi~8	14347	0.01	0.09	0	1
Eco_Activi~9	14347	0.25	0.43	0	1
Sector2	14360	0.75	0.43	0	1
mnthwgAllJob	37080	138.39	840.69	0	66240

Table 2: Method of Simple Sum

VARIABLES	(1) Empowerment Index	(2) ICT Ownership index Simple Sum	(3) Empowerment Index	(4) ICT Ownership index Simple Sum
ICT_SimpleSum	0.0726		0.128**	

	(0.0182)		(0.0320)	
educ2==literate without any diploma	1.062***	0.347***	1.021***	0.394***
	(0.0370)	(0.0675)	(0.0355)	(0.0766)
educ2==elementary school	0.593*	0.393***	0.602*	0.446***
	(0.0251)	(0.0870)	(0.0254)	(0.0989)
educ2==middle school	0.466	0.577***	0.728*	0.666***
	(0.0169)	(0.0949)	(0.0264)	(0.110)
educ2==General high school	0.641	1.027***	0.953	1.203***
	(0.0111)	(0.0723)	(0.0165)	(0.0847)
educ2==Vocational high school	1.117***	0.776***	1.534***	0.952***
	(0.0861)	(0.255)	(0.118)	(0.313)
educ2==post-secondary institute	0.908**	1.026***	1.961***	1.301***
	(0.0313)	(0.152)	(0.0675)	(0.192)
educ2==university & above	0.461	1.488***	1.888***	1.811***
	(0.0286)	(0.389)	(0.117)	(0.474)
Age	0.682***	0.0163***	0.737***	0.0268***
	(1.666)	(0.164)	(1.801)	(0.270)
age2	-0.842***	-0.00338	-0.892***	-0.0120***
	(-1.658)	(-0.0273)	(-1.755)	(-0.0967)
sex==Female	0	0.108***		
	(0)	(0.0377)		
crempstp==employer	2.016***	0.350***	0.119	0.235***
	(0.0531)	(0.0831)	(0.00314)	(0.0558)
crempstp==self employed	2.508***	0.0738*	0.672**	0.0469
	(0.115)	(0.0150)	(0.0309)	(0.00956)
crempstp==unpaid family worker	1.250***	0.461***	-0.963***	0.278***
	(0.111)	(0.150)	(-0.0857)	(0.0904)
region==Gr. Cairo	1.581***	1.001***	1.077***	1.108***
	(0.0816)	(0.242)	(0.0556)	(0.268)
region==Alx, Sz C.	1.593***	0.885***	1.348***	1.003***
	(0.0684)	(0.181)	(0.0579)	(0.205)
region==Urb. Lwr.	2.012***	0.458***	1.959***	0.563***
	(0.113)	(0.109)	(0.111)	(0.134)
region==Urb. Upp.	1.120***	0.475***	1.193***	0.555***
	(0.0692)	(0.123)	(0.0737)	(0.143)
region==Rur. Lwr.	1.785***	0.148***	1.687***	0.168***

	(0.152)	(0.0491)	(0.143)	(0.0557)
crocpcl==Leg.,Senior offic.& manag.	-1.860*	0.710***		
	(-0.0675)	(0.138)		
crocpcl==professionals	-1.231	0.568***		
	(-0.0719)	(0.133)		
crocpcl==Technic.& assoc.,prof.	-2.201**	0.614***		
	(-0.108)	(0.119)		
crocpcl==Clerks	-2.496**	0.608***		
	(-0.0871)	(0.0808)		
crocpcl==Serv.& shop/market sal. wrkrs	-2.378**	0.244***		
	(-0.104)	(0.0575)		
crocpcl==Skill. agr. & fish. wrkrs	-3.493**	0.186*		
	(-0.310)	(0.0654)		
crocpcl==Craft & related trad. wrkrs	-2.844**	0.324***		
	(-0.106)	(0.0843)		
crocpcl==Plant & machine operat. & assemb.	-3.012**	0.240***		
	(-0.0657)	(0.0409)		
crecac1d_86cd==Mining	0	0.510**		
	(0)	(0.0182)		
crecac1d_86cd==Manufact	-0.727	0.205**		
	(-0.0331)	(0.0487)		
crecac1d_86cd==Elect	0.353	0.409***		
	(0.00341)	(0.0282)		
crecac1d_86cd==Const	-2.899	0.107		
	(-0.0237)	(0.0192)		
crecac1d_86cd==Trade	-0.592	0.217**		
	(-0.0273)	(0.0534)		
crecac1d_86cd==Trans	-0.638	0.333***		
	(-0.0113)	(0.0576)		
crecac1d_86cd==Finance	0.891	0.616***		
	(0.0144)	(0.0424)		
crecac1d_86cd==Serv	0.287	0.162*		
	(0.0222)	(0.0515)		
crsector_PubPr==Private	-1.813***	-0.0870**		
	(-0.138)	(-0.0277)		
Monthly Wage (Prim.& Second. Jobs)	0.000169**	3.99e-05***	0.000207***	4.62e-05***

	(0.0289)	(0.0388)	(0.0355)	(0.0448)
Observations	4886	14303	4888	14312
R-squared	0.247	0.383	0.229	0.361

Normalized beta coefficients in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3: Method of Principle Component Analysis

VARIABLES	(1) ICT Ownership index Simple Sum	(2) Empowerment Index	(3) ICT Ownership index Simple Sum	(4) Empowerment Index
ICTegypt		0.0891		0.133**
		(0.0234)		(0.0351)
educ2==literate without any diploma	0.371***	1.054***	0.422***	1.016***
	(0.0690)	(0.0367)	(0.0784)	(0.0353)
educ2==elementary school	0.417***	0.581*	0.476***	0.593*
	(0.0884)	(0.0245)	(0.101)	(0.0250)
educ2==middle school	0.641***	0.445	0.737***	0.709*
	(0.101)	(0.0161)	(0.116)	(0.0257)
educ2==General high school	1.131***	0.599	1.327***	0.913
	(0.0762)	(0.0104)	(0.0893)	(0.0158)
educ2==Vocational high school	0.837***	1.094***	1.030***	1.515***
	(0.264)	(0.0844)	(0.324)	(0.117)
educ2==post-secondary institute	1.127***	0.879**	1.428***	1.934***
	(0.159)	(0.0303)	(0.202)	(0.0666)
educ2==university & above	1.651***	0.419	2.009***	1.851***
	(0.413)	(0.0260)	(0.503)	(0.115)
age	0.0190***	0.680***	0.0304***	0.736***
	(0.183)	(1.662)	(0.292)	(1.798)
age2	-0.00532	-0.840***	-0.0146***	-0.890***
	(-0.0411)	(-1.655)	(-0.113)	(-1.753)
sex==Female	0.125***	0		
	(0.0421)	(0)		
crempstp==employer	0.369***	2.010***	0.248***	0.118

	(0.0839)	(0.0530)	(0.0563)	(0.00311)
crempstp==self employed	0.0567	2.506***	0.0377	0.676**
	(0.0111)	(0.115)	(0.00735)	(0.0311)
crempstp==unpaid family worker	0.488***	1.241***	0.286***	-0.962***
	(0.152)	(0.110)	(0.0890)	(-0.0856)
region==Gr. Cairo	-0.0745*	1.663***	0.0486	1.217***
	(-0.0172)	(0.0859)	(0.0112)	(0.0628)
region==Alx, Sz C.	-0.181***	1.676***	-0.0461	1.488***
	(-0.0354)	(0.0720)	(-0.00902)	(0.0639)
region==Urb. Lwr.	-0.649***	2.105***	-0.529***	2.106***
	(-0.147)	(0.119)	(-0.120)	(0.119)
region==Urb. Upp.	-0.619***	1.212***	-0.529***	1.338***
	(-0.153)	(0.0749)	(-0.131)	(0.0827)
region==Rur. Lwr.	0.164***	1.782***	0.187***	1.686***
	(0.0519)	(0.152)	(0.0592)	(0.143)
crocpcl==Leg.,Senior offic.& manag.	0.782***	-1.884*		
	(0.145)	(-0.0684)		
crocpcl==professionals	0.601***	-1.244		
	(0.135)	(-0.0727)		
crocpcl==Technic.& assoc.,prof.	0.639***	-2.216**		
	(0.119)	(-0.109)		
crocpcl==Clerks	0.638***	-2.514**		
	(0.0812)	(-0.0877)		
crocpcl==Serv.& shop/market sal. wrkrs	0.243***	-2.388**		
	(0.0548)	(-0.104)		
crocpcl==Skill. agr. & fish. wrkrs	0.215*	-3.504**		
	(0.0720)	(-0.311)		
crocpcl==Craft & related trad. wrkrs	0.325***	-2.845**		
	(0.0809)	(-0.107)		
crocpcl==Plant & machine operat. & assemb.	0.224***	-3.011**		
	(0.0365)	(-0.0656)		
crecac1d_86cd==Mining	0.616***	0		
	(0.0211)	(0)		
crecac1d_86cd==Manufact	0.281**	-0.736		
	(0.0638)	(-0.0335)		
crecac1d_86cd==Elect	0.471***	0.351		

	(0.0310)	(0.00339)		
crecac1d_86cd==Const	0.177	-2.921		
	(0.0302)	(-0.0239)		
crecac1d_86cd==Trade	0.280**	-0.593		
	(0.0660)	(-0.0274)		
crecac1d_86cd==Trans	0.426***	-0.648		
	(0.0705)	(-0.0114)		
crecac1d_86cd==Finance	0.741***	0.882		
	(0.0488)	(0.0142)		
crecac1d_86cd==Serv	0.230**	0.282		
	(0.0698)	(0.0218)		
crsector_PubPr==Private	-0.0815**	-1.809***		
	(-0.0249)	(-0.138)		
Monthly Wage (Prim.& Second. Jobs)	4.47e-05***	0.000168**	5.16e-05***	0.000206***
	(0.0415)	(0.0288)	(0.0479)	(0.0353)
Observations	14303	4886	14312	4888
R-squared	0.256	0.247	0.232	0.230

Normalized beta coefficients in parentheses

*** p<0.01, ** p<0.05, * p<0.1